**KESANS: International Journal of Health and Science**
**2808-7178 / 2808-7380**
http://kesans.rifainstitute.com/index.php/kesans/index

# Patient Characteristics and Quality of Life After Total Knee Replacement for Knee Osteoarthritis at RSPAL Dr. Ramelan, 2019 - 2023

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**Article Information**
*Submitted:* **15 September 2026**
*Accepted:* **20 October 2026**
*Publish:* **26 October 2026**

**Keyword:** Knee Osteoarthritis; Total Knee Replacement, Quality Of Life; Patient Characteristics; Elderly Patients;

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**Year: 2026**

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***Abstract***
***Introduction:*** *Knee osteoarthritis is a degenerative joint disease that commonly affects older adults and often requires total knee replacement when conservative treatment is no longer effective.* ***Objective:*** *This study aimed to describe the demographic and clinical characteristics of patients with knee osteoarthritis who underwent total knee replacement at RSPAL Dr. Ramelan, Surabaya, from 2019 to 2023, and to describe their postoperative quality of life using the Short Form-36 (SF-36) questionnaire.* ***Method:*** *A descriptive study was conducted using secondary data from randomly selected medical records. A total of 132 patient records were analysed for demographic and clinical characteristics, while quality of life after surgery was assessed in 34 patients using the Short Form-36 questionnaire. The data were analysed descriptively using Microsoft Excel and Statistical Package for the Social Sciences.* ***Result and Discussion:*** *Most patients were female (83.3%) and older than 65 years (47.7%). Overweight or obesity was found in 68.2% of patients, hypertension in 39.4%, diabetes mellitus in 18.9%, and postmenopausal status in 92.7% of female patients. Among the 34 respondents assessed after surgery, 73.5% reported good quality of life, while 26.5% reported poor quality of life. These findings describe the reported quality of life among respondents but do not establish changes in quality of life following surgery.* ***Conclusions:*** *Patients undergoing total knee replacement were predominantly elderly women, and most experienced good postoperative quality of life.*

How to Cite **Josephine Passareta Riduvan FN, Juan Matthew Liando, Juan Reynaldy Gotama, Kadek Rina Masreni, Karmenita Christina/Patient Characteristics and Quality of Life After Total Knee Replacement for Knee Osteoarthritis at RSPAL Dr. Ramelan, 2019 - 2023/Vol. 6, No. 1, 2026**
DOI https://doi.org/10.54543/kesans.v6i1.750
e-ISSN/p-ISSN **2808-7178 / 2808-7380**
Published by **CV. Rifainstitut/KESANS: International Journal of Health and Science**

## Introduction

Osteoarthritis (OA) is the most common chronic degenerative joint disease (Akbar, H., & Santoso, 2019). The disease is characterized by clinical symptoms resulting from abnormalities in joint tissues. It is primarily caused by damage to the articular cartilage, which leads to pain, swelling, and stiffness around the affected joints (Perhimpunan Reumatologi Indonesia, 2023b). According to the World Health Organization (WHO), the global prevalence of OA among individuals aged >60 years is 9.6% in men and 18% in women. As age increases, the incidence of OA is higher among women than men (Yunus, M.H.M., Nordin, A. and Kamal, 2021). Other factors that may contribute to the development of knee OA include obesity, sports injuries, and physical activities that involve repeated knee flexion, such as squatting (Blaustein, D. M., & Phillips, 2020).

According to the United Kingdom National Institute for Health and Care Excellence (NICE), patients with knee OA may consider various surgical intervention options, such as arthroplasty, which involves realignment and total or partial joint replacement. Surgical interventions are generally performed in patients with end-stage knee OA who do not respond adequately to other treatments (American Academy of Orthopaedic Surgeons (AAOS), 2019). Knee joint replacement is one of the recommended surgical interventions and has demonstrated favorable outcomes in reducing pain and improving quality of life. However, approximately 5–15% of patients derive limited benefit from this intervention (Apley. Alan Graham, & Solomon, 2018). These outcomes indicate that although TKR can provide substantial benefits, postoperative quality of life may vary among patients. Therefore, evaluating quality of life after surgery is important for understanding patient-reported outcomes beyond the successful completion of the surgical procedure.

Quality of life after TKR may be influenced by several demographic, clinical, functional, and psychological factors. Demographic factors include age and sex, while clinical factors include body mass index (BMI) and comorbidities such as hypertension and diabetes mellitus (Shetty et al., 2024). Pain severity, physical function, psychological well-being, and social support may also contribute to differences in postoperative recovery and quality of life. Previous systematic reviews have identified advanced age, higher BMI, comorbidities, persistent postoperative pain, and psychological distress as factors associated with quality-of-life outcomes following TKR (Da Silva et al., 2014). These findings suggest that postoperative quality of life should be considered in relation to both patients' clinical profiles and their recovery experiences.

Despite existing evidence on quality-of-life outcomes following TKR, further assessment of patient characteristics and postoperative quality of life in specific hospital settings remains relevant. In particular, the available evidence presented in this study does not establish how the characteristics of patients undergoing TKR at RSPAL Dr. Ramelan correspond to their postoperative quality-of-life outcomes during the 2019–2023 period. Describing these characteristics alongside patients' quality-of-life status may provide locally relevant information for evaluating postoperative outcomes. However, because this study uses a descriptive design, it does not aim to establish causal relationships or determine the statistical significance of associations between individual patient characteristics and quality of life.

Therefore, this study aimed to describe the demographic and clinical characteristics of patients with knee osteoarthritis who underwent TKR at RSPAL Dr. Ramelan, Surabaya, from 2019 to 2023, and to describe their postoperative quality of life using the

Short Form-36 (SF-36) questionnaire. The findings are expected to provide an overview of the patient profile and postoperative quality-of-life outcomes in this hospital setting.

## Method

This study employed a descriptive observational design using quantitative descriptive analysis to describe the demographic and clinical characteristics of patients with knee osteoarthritis who underwent total knee replacement (TKR) at RSPAL Dr. Ramelan, Surabaya, Indonesia, from 2019 to 2023. Data were obtained from patients' medical records and the Short Form-36 (SF-36) questionnaire, which was used to assess postoperative quality of life (Pratama, 2019).

The study population comprised patients diagnosed with knee osteoarthritis (gonarthrosis) who underwent TKR at RSPAL Dr. Ramelan during the 2019–2023 period. The required minimum sample size was 68 patients, and 132 patient records were included in the analysis using a random sampling technique. The medical records provided information on age, sex, body mass index (BMI), history of hypertension, history of diabetes mellitus, and menopausal status. Of the 132 patients whose medical records were analyzed, 34 completed the SF-36 questionnaire and were included in the descriptive analysis of postoperative quality of life. The quality-of-life results were categorized as good or poor, as presented in the Results section.

Data collection was conducted from November 2023 to August 2024. The medical records analyzed covered the period from 2019 to 2023. The collected data were organized using Microsoft Excel and analyzed descriptively using SPSS version 22. Frequencies and percentages were used to summarize patient demographic and clinical characteristics and the distribution of postoperative quality of life. Because the study was descriptive and did not include preoperative quality-of-life measurements, the analysis was not intended to establish causal relationships or determine changes in quality of life following TKR.

## Result and Discussion

### 1. Result

This study was conducted among patients with knee osteoarthritis who had undergone total knee replacement surgery at RSPAL dr. Ramelan Surabaya from 2019 to 2023. The data were obtained from medical records during this period and were sampled randomly, resulting in 132 patients with knee osteoarthritis who had undergone total knee replacement. Of the 132 patients, 34 completed the SF-36 questionnaire in full.

### Description of Gender

Based on data from 132 patients with knee osteoarthritis who underwent total knee replacement at RSPAL Dr. Ramelan, Surabaya, from 2019 to 2023, 110 patients (83.3%) were female and 22 patients (16.7%) were male. Female patients accounted for the majority of the study population.

**Table 1**
Distribution of Patients by Gender

| Gender | Frequency | Percentage |
|---|---|---|
| Male | 22 | 16.7% |
| Female | 110 | 83.3% |
| Total | 132 | 100.0% |

**Description of Age**

Based on data from 132 patients with knee osteoarthritis who had undergone total knee replacement at RSPAL dr. Ramelan Surabaya from 2019 to 2023, 1 patient (0.8%) was aged 36–45 years, 18 patients (13.6%) were aged 46–55 years, 50 patients (37.9%) were aged 56–65 years, and 63 patients (47.7%) were older than 65 years. The largest proportion of patients belonged to the group aged over 65 years.

**Table 2**
Distribution of Patients by Age Group

| Age Group | Frequency | Percentage |
|---|---|---|
| Late Adulthood | 1 | 0.8% |
| Early Older Adulthood | 18 | 13.6% |
| Late Older Adulthood | 50 | 37.9% |
| Elderly | 63 | 47.7% |
| Total | 132 | 100.0% |

**Description of Clinical Characteristics**

The clinical characteristics assessed in this study included body mass index (BMI), history of hypertension, history of diabetes mellitus, and menopausal status among female patients. The distributions of these characteristics are presented in Tables 3–6.

**Table 3**
Distribution of Patients by Body Mass Index

| Body Mass Index | Frequency | Percentage |
|---|---|---|
| Normal | 42 | 31.8% |
| Overweight | 36 | 27.3% |
| Class I Obesity | 41 | 31.1% |
| Class II Obesity | 13 | 9.8% |
| **Total** | **132** | **100.0%** |

**Table 4**
Distribution of Patients by History of Hypertension

| Hypertension | Frequency | Percentage |
|---|---|---|
| Yes | 52 | 39.4% |
| No | 80 | 60.6% |
| **Total** | **132** | **100.0%** |

**Table 5**
Distribution of Patients by History of Diabetes Mellitus

| Diabetes Mellitus | Frequency | Percentage |
|---|---|---|
| Yes | 25 | 18.9% |
| No | 107 | 81.1% |
| **Total** | **132** | **100.0%** |

**Table 6**
Distribution of Menopausal Status Among Female Patients

| Menopause | Frequency | Percentage |
|---|---|---|
| Yes | 102 | 92.7% |
| No | 8 | 7.3% |
| **Total** | **110** | **100.0%** |

**Description of Quality of Life After Total Knee Replacement**

Based on SF-36 questionnaire results from 34 patients with knee osteoarthritis who underwent total knee replacement at RSPAL dr. Ramelan Surabaya from 2019 to 2023, 25 patients (73.5%) had a good quality of life, while 9 patients (26.5%) had a poor quality of life.

**Table 7**
Distribution of Quality of Life Among Patients with Knee Osteoarthritis After Total Knee Replacement

| Quality of Life | Frequency | Percentage |
|---|---|---|
| Good | 25 | 73.5% |
| Poor | 9 | 26.5% |
| **Total** | **34** | **100.0%** |

## 2. Discussion

Based on data from patients with confirmed knee osteoarthritis who underwent total knee replacement surgery at RSPAL Dr. Ramelan Surabaya from 2019 to 2023 and were selected through random sampling, a total of 132 patient records were obtained. All 132 patients who underwent total knee replacement surgery met the inclusion criteria.

**Gender**

In this study, the frequency distribution by gender among patients with knee osteoarthritis who underwent total knee replacement surgery at RSPAL Dr. Ramelan Surabaya showed that female patients were predominant, with 110 patients (83.3%), whereas 22 patients (16.7%) were male. This finding is consistent with a study conducted by (Claudia G, Saturti TI., 2020) at Sanglah General Hospital, Denpasar, which similarly reported a higher proportion of female patients, reaching 70.4%. This finding is also consistent with another study conducted by Agrasan Duha in 2019, in which the majority of patients were female, comprising 26 patients (78.8%), while 7 patients (21.2%) were male (Duha, 2019). Older women entering menopause experience a decline in estrogen levels and other physiological functions. One of the functions of estrogen is to support chondrocyte synthesis, which involves cartilage cells located within the bone matrix. Decreased estrogen levels lead to reduced chondrocyte synthesis, resulting in decreased synthesis of proteoglycans and collagen. In addition, increased lysosomal activity occurs with advancing age, which may contribute to the higher occurrence of osteoarthritis among women (Nugraha, R.W., Kurniati, M., Detty, A.U. and Marlina, 2023).

**Age**

In this study, the age distribution of patients with knee osteoarthritis who underwent total knee replacement surgery at RSPAL Dr. Ramelan Surabaya showed that the largest proportion was in the elderly group (>65 years), with 63 cases (47.7%), followed by the late-older-adult group (56–65 years), with 50 patients (37.9%), the early-older-adult group (46–55 years), with 18 patients (13.6%), and the late-adulthood group (36–45 years), with 1 patient (0.8%). This finding is consistent with a study conducted by Ra'ida et al., which reported that the majority of subjects with knee OA were middle-aged adults (31–59 years). When grouped by age, 28 study subjects with knee OA were between 50 and 80 years of age (Putri, R. A. A. S. H., Ilmiawan, M. I., 2022). In addition, this finding is consistent with a study conducted by Nugraha et al., in which the age distribution of patients at Abdul Moeloek Regional General Hospital, Lampung Province, showed that the largest proportion was aged ≥50 years, comprising 26 patients (57.8%) (Nugraha, R.W., Kurniati, M., Detty, A.U. and Marlina, 2023). This may be attributed to the degenerative processes that occur after the age of 50 years and the decline in functional capacity resulting from decreased protein content in the articular cartilage and excessive loading of the knee joint. These processes may lead to the formation of osteophytes, which can cause pain in the knee area. Aging adversely affects the ability of joints to protect themselves from biomechanical stress due to structural changes in the articular cartilage, such as thinning of the noncalcified cartilage layer (Putri, R. A. A. S. H., Ilmiawan, M. I., 2022).

**Comorbid Conditions**

Body Mass Index, based on this study, the results showed that body mass index was associated with the occurrence of knee osteoarthritis. A total of 90 patients had a body mass index in the overweight category or higher (BMI ≥23), comprising 36 patients (27.3%) in the overweight category, 41 patients (31.1%) with class I obesity, and 13 patients (9.8%) with class II obesity. This finding is consistent with the study conducted by Ferdiansyah, in which 28 of 36 study subjects with obesity experienced osteoarthritis. This finding is also consistent with the study by Mambodiyanto, which reported that individuals with a higher BMI had a 4.9-fold greater risk of developing knee osteoarthritis (Putri, R. A. A. S. H., Ilmiawan, M. I., 2022).

Hypertension, the distribution of risk factors among patients with knee osteoarthritis who underwent total knee replacement at RSPAL Dr. Ramelan Surabaya from 2019 to 2023 showed that 52 patients (39.4%) had a history of hypertension. These findings are consistent with a study conducted by Hairil, which showed that among respondents with knee osteoarthritis (case group), 50.0% had a history of hypertension, whereas among respondents without knee osteoarthritis (control group), 32.3% had a history of hypertension (Vad, V. B., Adin, D. R., & Solomon, 2022). This indicates that the proportion of respondents with a history of hypertension tended to be higher among those with knee osteoarthritis than among those without knee osteoarthritis. The odds ratio (OR) was 2.100 (95% CI: 1.013–4.353), indicating that respondents with a history of hypertension had a 2.100-fold higher risk of knee osteoarthritis than respondents without a history of hypertension (Akbar, H., & Santoso, 2019).

Diabetes Mellitus, in this study, 25 patients with knee osteoarthritis (18.9%) had a history of diabetes mellitus. These findings are consistent with the study conducted by Maruf, which reported that among patients without diabetes mellitus, the largest

proportion comprised 19 patients (42.2%) with severe knee osteoarthritis, while among patients with diabetes mellitus, the largest proportion comprised 9 patients (20.0%) with severe knee osteoarthritis. Based on the results of bivariate analysis using the chi-square test, a p-value of 0.828 ($p < 0.05$) was obtained, indicating that there was no significant association between type II diabetes mellitus and the severity of knee osteoarthritis (Subroto, M. H., Supartono, B., & Herardi, 2021).

Menopause, the results of this study showed that 102 of the 110 female patients (92.7%) were postmenopausal, whereas 8 patients (7.3%) were not postmenopausal. This finding is similar to that of a study conducted by Bimo, which reported that among female patients with osteoarthritis, 478 women (87%) out of 549 women diagnosed with osteoarthritis were menopausal, whereas 71 women (13%) were not yet menopausal (Felson, D. T., & Neogi, 2022). A previous literature review concluded that progressive structural and functional changes occur in articular structures during the early menopausal phase and persist during the postmenopausal period, contributing to an increased prevalence of osteoarthritis. This study demonstrated the relevant role of estrogen in maintaining joint tissue homeostasis (Bimo, 2019).

**Quality of Life After Total Knee Replacement**

In this study, the frequency distribution of quality of life after total knee replacement among patients with knee osteoarthritis who underwent total knee replacement surgery at RSPAL Dr. Ramelan Surabaya showed that the majority of patients had a good quality of life. A total of 25 patients (73.5%) had a good quality of life, whereas 9 patients (26.5%) had a poor quality of life. This finding is consistent with a study conducted by Fachri et al., in which the quality of life of patients after total knee replacement was classified into two categories: good and poor quality of life (Perhimpunan Reumatologi Indonesia, 2023a). The study showed that among patients with osteoarthritis who underwent total knee replacement surgery, 57.14% had a good quality of life, while 42.86% had a poor quality of life (Fachri, M., Tekwan, G. and Sulistiawati, 2020). In addition, this finding is consistent with a study conducted by Mandour et al., which reported that 62% of the patients studied had a good quality of life after undergoing total knee replacement surgery, while 38% had a poor quality of life (Mandour, nagwa, Shahin, E. Abd EL Reheem, 2022)

**Conclusion**

Patients with knee osteoarthritis who underwent total knee replacement at RSPAL Dr. Ramelan Surabaya from 2019 to 2023 were predominantly female (83.3%) and aged over 65 years (47.7%). Clinical characteristics included hypertension, diabetes mellitus, elevated BMI, and postmenopausal status among female patients. Among the 34 respondents who completed the SF-36 questionnaire, 73.5% reported good quality of life, while 26.5% reported poor quality of life. These findings describe the characteristics of the study population and the reported quality of life among respondents but do not establish whether surgery caused changes in quality of life. Further studies using preoperative and postoperative assessments may provide a more comprehensive evaluation of quality-of-life outcomes following total knee replacement.

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