Journal of Pioneering Medical Sciences
Received: February 04, 2025 | Accepted: April 01, 2025 | Published: April 27, 2025
Volume 14, Issue S01, Pages 473-480

DOI https://doi.org/10.47310/jpms202514S0162

Patient Satisfaction in Terms of Pain and ROM After Total Knee Arthroplasty: A Cross-Sectional Study Conducted at a Single Center

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Abstract **Introduction:** Total knee arthroplasty (TKA) is a widely approved procedure for treating end-stage knee osteoarthritis and offers significant benefits in terms of mobility, pain relief and overall quality of life. Pain control and post-operative range of motion are key factors affecting patient satisfaction, making it crucial to assess the quality of life post-surgery. While TKA is becoming more popular in Saudi Arabia, particularly in the Qassim province, there is still limited research on patient experiences and satisfaction, highlighting the need for further studies to improve care. **Methods:** This cross-sectional study included 26 post-TKA patients from a single center. Data on demographics, pain levels, range of motion and satisfaction were collected using self-administered questionnaires. Data were cleaned in Excel and analyzed using the International Business Machines Statistical Package for the Social Sciences (IBM SPSS) 29.0.0. **Results:** Our study included 26 participants, predominantly females (n = 21, 80.8%), with a mean age of 59.5 years (SD = 6.5). Nearly half (n = 12, 46.2%) reported severe knee pain TKA. Despite challenges in routine tasks, (n = 20, 76.9%) described surgery results as excellent. Moderate to severe knee pain significantly interfered with routine tasks ($p<0.001$), particularly among those with less than a high school education (n = 14, 87.5%, p = 0.032). Decreased range of motion (ROM) was significantly associated with lower weight (p = 0.029) and severe pain ($p<0.001$). Patient satisfaction was high (n = 22, 84.6%), although those with moderate pain were less likely to be satisfied (n = 3, 60.0%; p = 0.200). The education level approached significance in terms of satisfaction (p = 0.052). **Conclusions:** Our study highlights the importance of pain management, ROM and social factors such as education in TKA outcomes. Comprehensive multidisciplinary care is essential for addressing both physical and psychosocial needs. Further research with larger sample sizes and longer follow-up periods is recommended.

Key Words Total Knee Arthroplasty, Pain, Saudi Arabia, Retrospective study

INTRODUCTION

Total Knee Arthroplasty (TKA) is a common surgical procedure designed to relieve pain and improve the quality of life of patients with end-stage osteoarthritis and other debilitating knee conditions [1]. Surgery involves replacing damaged knee joints with prosthetic components, which helps restore joint function and alleviate pain. The growing prevalence of osteoarthritis, particularly among aging populations, has made TKA one of the most frequently performed orthopedic surgeries worldwide, including Saudi Arabia [2]. However, while TKA is highly effective, patient satisfaction remains a crucial metric for evaluating the success of surgery, particularly in terms of post-operative pain relief and restoration of Range of Motion (ROM) [3].

With the increase in demand for TKA, understanding patient satisfaction, especially with respect to pain management and ROM, has gained importance. These factors are key determinants of whether patients feel that the procedure has improved their QoL. Pain, if not properly managed post-operatively, can lead to prolonged discomfort, delayed recovery and dissatisfaction [4]. Similarly, the

extent to which ROM is restored after surgery influences patients' ability to perform daily activities and impacts their overall satisfaction with the procedure [5].

Patient satisfaction after TKA is a multidimensional outcome, exploring not only clinical factors such as pain and ROM, but also psychological and social elements. Healthcare providers must focus on pain management strategies, rehabilitation protocols and individualized patient care to optimize these outcomes [6]. Measuring and improving patient satisfaction with these specific aspects can enhance overall healthcare quality, reduce recovery time and improve long-term outcomes in patients undergoing TKA.

Several studies have been conducted globally to evaluate patient outcomes after TKA. Research from both Western and Middle Eastern countries has consistently demonstrated that, while most patients experience significant improvements in pain relief and ROM, satisfaction levels can vary [7]. A study conducted in the province of Ontario found that approximately 72 – 86 % of patients were satisfied with their pain relief after TKA. Another study revealed that while ROM was generally restored to functional levels, many patients expressed dissatisfaction owing to unmet expectations or prolonged pain [8].

Literature from Saudi Arabia and neighboring Gulf countries has focused on TKA outcomes; however, specific investigations into the Qassim province and its unique patient population are limited [9]. Studies have primarily highlighted the importance of culturally appropriate care, patient education and postsurgical rehabilitation in achieving better patient outcomes [10,11]. Moreover, factors such as sex, age and comorbidities have been shown to influence satisfaction levels, with older patients and those with pre-existing health conditions often reporting lower satisfaction.

Despite the existing body of research, there are gaps in the understanding of patient satisfaction in terms of pain and ROM following TKA, particularly in the context of Saudi Arabia's healthcare system. Limited studies have been conducted in this region and the specific factors influencing patient satisfaction remain underexplored. Our study aimed to address this gap by investigating the experiences of patients undergoing TKA at a single center. By focusing on pain relief and ROM as key indicators of patient satisfaction, this study sought to guide improvements in patient care, rehabilitation protocols and overall surgical outcomes.

MATERIALS AND METHODS

Research design and duration

This is a cross-sectional study. The study took place from November 1, 2023, to February 29, 2024.

Data Collection and Analysis

Data were collected using self-administered questionnaires distributed to patients by trained data collectors at a single center. The questionnaire consisted of two parts. The first part addressed patient satisfaction with pain relief and improvement in physical activity following surgery. The second part evaluated patients' perceptions of how surgery impacted their overall quality of life. Prior to the analysis, the dataset was checked for missing or incomplete data.

Study Population and Sampling Procedure

Convenience sampling was used in this study. A consecutive random sampling technique was employed to select adult patients aged ≥ 45 years who had undergone primary TKA at BCH and returned for follow-up appointments. Patients who could not attend the follow-up were contacted via phone.

Subject Recruitment

Inclusion Criteria

Patients aged 45 years or older who underwent primary TKA at a single center between November 1, 2023 and February 29, 2024.

Exclusion Criteria

Patients who underwent revision TKA, those with causes of knee dysfunction other than osteoarthritis (OA) and individuals with a Body Mass Index (BMI) of 40 or higher were excluded from the study.

Location of the Study

The study was conducted at a single center in Saudi Arabia.

Management Plan

Patient data were collected through an electronic self-report questionnaire and sent to the phone numbers listed in their medical records. The questionnaire did not request any sensitive information and all the data were stored securely on a password-protected laptop. Data were compiled into an electronic spreadsheet for analysis using the Statistical Package for the Social Sciences (SPSS). After the research paper was published, all the data were permanently deleted to ensure patient privacy. Patients who met the exclusion criteria were excluded from the study.

STROCSS criteria

This study has been reported in line with the STROCSS criteria for reporting cohort, cross-sectional and case-control studies in surgery [25].

Ethical Considerations

Approval was obtained from the regional research ethics committee before commencing the study. Permission was also granted by the center and all relevant hospital regulations were followed throughout the study. No interventions were performed in this study. Informed consent was obtained from all patients prior to the distribution of the questionnaire, with an explanation of their rights, including the option to withdraw from the study at any time.

Statistical Analysis

A comprehensive statistical analysis was conducted on the dataset, encompassing both the descriptive and inferential methodologies. A descriptive analysis was conducted to

summarize the demographic characteristics of the participants, including age, sex and other features. The Chi-Square Test and Fisher's Exact Test were used to assess the association between categorical variables. All statistical analyses were performed using International Business Machines (IBM) SPSS Statistics for Windows version 29.0.0.

RESULTS

Our study included 26 participants, with the majority being female (n = 21, 80.8%) and a smaller proportion male (n = 5, 19.2%). Participants' ages ranged from 48 to 76 years, with a mean age of 59.5 years (SD = 6.5). The average weight was 79.7 kg (SD = 12.9), ranging from 57 to 110 kg, while the mean height was 159.3 cm (SD = 6.4), ranging from 148 to 172 cm. The mean BMI was 31.1 kg/m² (SD = 5.3), with a range from 22.9 to 39.9 kg/m². Regarding educational level, most participants had less than a high school education (n = 16, 61.5%), followed by those with a high school diploma (n = 8, 30.8%) and a small number held a bachelor's degree (n = 2, 7.7%) (Table 1).

The severity of knee pain among the 26 participants showed that nearly half of the participants (46.2%) reported experiencing severe knee pain, while 19.2% described their pain as moderate. A smaller proportion, 11.5%) reported very mild to mild pain and 23.1% of participants indicated that they experienced no pain at all.

Pain assessment, improvement in physical activity and range of motion (ROM) after surgery show various noticeable features. Regarding knee pain, n6 (23.1%) reported no pain, while n = 12 (46.2%) experienced severe pain. Difficulties with self-care due to knee issues were noted by n11 (42.3%) who found it extremely difficult or impossible. Similarly, n = 11 (42.3%) faced significant challenges getting in and out of cars or using public transport. Walking was severely limited by pain for n = 2 (7.7%), while n = 9 (34.6%) could walk without pain for over 30 min. Standing up from a chair post-meal was pain-free for n = 10 (38.5%), but n = 9 (34.6%) found it very painful. Limping was reported rarely or never by n = 11 (42.3%), whereas n = 3 (11.5%) limped constantly. Kneeling down and getting up was impossible for n = 7 (26.9%). Night pain was not an issue for n = 14 (53.8%), while n = 3 (11.5%) experienced pain every night. Knee pain interfered greatly or completely with work for n10 (38.5%). The sensation of the knee "giving way" was experienced often by n = 1 (3.8%) and constantly by n = 4 (15.4%). Shopping was extremely difficult or not impossible for n10 (38.5%). Walking down stairs was extremely difficult or impossible for n = 13 (50.0%). Despite these challenges, n = 20 (76.9%) described their operation results as excellent. (Table 2).

The Patient satisfaction with knee improvement following total knee arthroplasty (TKA) showed that the majority of participants (n = 22, 84.6%) reported feeling "Much Better" after the surgery. A small percentage (n = 1, 3.8%) felt "Little Better" or "Little Worse," while (n = 2, 7.7%) of participants reported feeling "Much Worse".

The association between different features and interference of knee pain with routine tasks showed various significant features. The gender distribution showed no significant association, with n = 15 (71.4%) of females and n = 4 (80.0%) of males experiencing moderate to severe interference (p = 1.000). Age did not significantly differ between those with no/mild interference (mean = 57.43, SD = 8.05) and moderate/severe interference (mean = 60.32, SD = 5.91, p = 0.326). Weight, height and BMI also showed no significant association (p = 0.096, p = 0.272 and p = 0.352, respectively). However, education level was significantly associated with routine task interference, with those with less than a high school education being more likely to report moderate/severe interference n = 14 (87.5%) compared to those with a bachelor's degree (p = 0.032). The severity of knee pain was highly significant, with all participants reporting that severe pain experienced moderate/severe interference (p<0.001). Statistical significance for categorical variables was determined using the chi-squared test or Fisher's exact test, as indicated by "b" (Table 3).

The association between different features and range of motion (ROM) shows various significant features. Sex was not significantly associated with ROM, with n = 16 (76.2%) of females and n = 4 (80.0%) of males experiencing decreased ROM (p = 1.000). The mean age was similar between those with unaffected ROM (mean = 58.83, SD = 7.83) and those with decreased ROM (mean = 59.75, SD = 6.29, p = 0.769). Weight showed a significant association with decreased ROM and a lower mean weight (mean = 77.05, SD = 11.70)

Table 1: Sociodemographic and other parameters of participants (n = 26)

		Frequency N (%)
Gender	Female	21 (80.8%)
	Male	5 (19.2%)
Age (Years)	Mean (SD)	59.5 (6.5)
	Range	48-76
Weight (Kg)	Mean (SD)	79.7 (12.9)
	Range	57-110
Height (cm)	Mean (SD)	159.3 (6.4)
	Range	148-172
BMI (kg/m2)	Mean (SD)	31.1 (5.3)
	Range	22.9-39.9
Education Level	Less than High School	16 (61.5%)
	High School	8 (30.8%)
	Bachelor's Degree	2 (7.7%)

Table 2: Assessment of pain, physical activity improvement and ROM after surgery (n = 26)

		Frequency N (%)
How would you describe the pain you usually have from your knee?	None	6 (23.1%)
	Very Mild/Mild	3 (11.5%)
	Moderate	5 (19.2%)
	Severe	12 (46.2%)
Have you had any trouble with washing and drying yourself (all over) because of your knee?	No Trouble at All	8 (30.8%)
	Very Little/Moderate Trouble	7 (26.9%)
	Extremely Difficult/Unable to do	11 (42.3%)
Have you had any trouble getting in and out of a car or using public transport because of your knee?	No Trouble at All	9 (34.6%)
	Very Little/Moderate Trouble	6 (23.1%)
	Extremely Difficult/Unable to do	11 (42.3%)
For how long have you been able to walk before pain from your knee becomes severe?	No Pain/>30 Minutes	9 (34.6%)
	Around the House only	3 (11.5%)
	5-15 Mins	6 (23.1%)
	16-30 Mins	6 (23.1%)
	Not at All/Severe Pain when Walking	2 (7.7%)
After a meal (sat at a table), how painful has it been for you to stand up from a chair because of your knee?	No Pain at All	10 (38.5%)
	Slightly/Moderately Painful	7 (26.9%)
	Very Painful/Unbearable	9 (34.6%)
Have you been limping when walking, because of your knee?	Rarely/Never	11 (42.3%)
	Sometime/Just at First	7 (26.9%)
	Often (Not Just at First)	1 (3.8%)
	Most of Time	4 (15.4%)
	All Time	3 (11.5%)
Could you kneel down and get up again afterwards?	Yes (Easily)	6 (23.1%)
	With Little Difficulty	3 (11.5%)
	With Moderate Difficulty	4 (15.4%)
	With Extreme Difficulty	6 (23.1%)
	No (Impossible)	7 (26.9%)
Have you been troubled by pain from your knee in bed at night?	No Nights	14 (53.8%)
	Some Nights	6 (23.1%)
	Most Nights	3 (11.5%)
	Every Nights	3 (11.5%)
How much has pain from your knee interfered with your usual work (including housework)?	Not at All	7 (26.9%)
	A Little Bit/Moderately	9 (34.6%)
	Greatly/Totally	10 (38.5%)
Have you felt that your knee might suddenly 'give way' or let you down?	Rarely/Never	11 (42.3%)
	Sometime (Just at First)	6 (23.1%)
	Often (Not Just at First)	1 (3.8%)
	Most of Time	4 (15.4%)
	All Time	4 (15.4%)
Could you do the household shopping on your own?	Yes (Easily)	9 (34.6%)
	Little/Moderately Difficult	7 (26.9%)
	Extremely Difficult/Not Possible	10 (38.5%)
Could you walk down one flight of stairs?	Yes (Easily)	6 (23.1%)
	Little/Moderately Difficult	7 (26.9%)
	Extremely Difficult/Not Possible	13 (50.0%)
How would you describe the results of your operation?	Poor	3 (11.5)
	Very Good	3 (11.5)
	Excellent	20 (76.9)

Table 3: Association between different features and routine tasks interference (n = 26)

		Knee pain interfere with routine tasks		Sig. Vale
		No/Mild	Moderate/Sever	
Gender	Female	6 (28.6%)	15 (71.4%)	1.000
	Male	1 (20.0%)	4 (80.0%)	
Age	Mean (SD)	57.43 (8.05)	60.32 (5.91)	0.326
Weight	Mean (SD)	88.20 (13.77)	77.33 (11.98)	0.096
Height	Mean (SD)	162.20 (5.11)	158.56 (6.66)	0.272
BMI	Mean (SD)	33.11 (5.40)	30.54 (5.32)	0.352
Education level	Less than High School	2 (12.5%)	14 (87.5%)	0.032
	High School	3 (37.5%)	5 (62.5%)	
	Bachelor's Degree	2 (100.0%)	0 (0.0%)	
How would you describe the pain you usually have from your knee?	None	6 (100.0%)	0 (0.0%)	<0.001
	Very Mild/Mild	1 (33.3%)	2 (66.7%)	
	Moderate	0 (0.0%)	5 (100.0%)	
	Severe	0 (0.0%)	12 (100.0%)	

Table 4: Association between different features and ROM (n = 26)

		Not Affected N (%)	Decreased N (%)	Sig. Value
Gender	Female	5 (23.8%)	16 (76.2%)	1.000
	Male	1 (20.0%)	4 (80.0%)	
Age	Mean (SD)	58.83 (7.83)	59.75 (6.290)	0.769
Weight	Mean (SD)	92.25 (11.98)	77.05 (11.70)	0.029
Height	Mean (SD)	160.75 (4.57)	159.05 (6.82)	0.643
BMI	Mean (SD)	35.01 (3.85)	30.28 (5.30)	0.107
Education Level	Less than High School	2 (12.5%)	14 (87.5%)	0.228
	High School	3 (37.5%)	5 (62.5%)	
	Bachelor's Degree	1 (50.0%)	1 (50.0%)	
How would you describe the pain you have from your knee?	None	6 (100.0%)	0 (0.0%)	<0.001
	Very Mild/Mild	0 (0.0%)	3 (100.0%)	
	Moderate	0 (0.0%)	5 (100.0%)	
	Severe	0 (0.0%)	12 (100.0%)	

Table 5: Association between different features and patients satisfaction with outcome of surgery (n = 26)

		Not Satisfied N (%)	Satisfied N (%)	Sig. Value
Gender	Female	2 (9.5%)	19 (90.5%)	1.000
	Male	1 (20.0%)	4 (80.0%)	
Age	Mean (SD)	55.0 (5.0)	60.1 (6.5)	0.206
Weight	Mean (SD)	79.0 (1.7)	79.8 (13.8)	0.923
Height	Mean (SD)	163.67 (7.2)	158.70 (6.2)	0.220
BMI	Mean (SD)	29.58 (2.3)	31.33 (5.6)	0.609
Education level	Less than High School	0 (0.0%)	16 (100.0%)	0.052
	High School	3 (37.5%)	5 (62.5%)	
	Bachelor's Degree	0 (0.0%)	2 (100.0%)	
How would you describe the pain you usually have from your knee?	None	0 (0.0%)	6 (100.0%)	0.200
	Very Mild/Mild	0 (0.0%)	3 (100.0%)	
	Moderate	2 (40.0%)	3 (60.0%)	
	Severe	1 (8.3%)	11 (91.7%)	

compared to those with unaffected ROM (mean = 92.25, SD = 11.98, p = 0.029). Height and BMI were not significantly associated (p = 0.643 and p = 0.107, respectively). Education level was also not significantly associated with ROM (p = 0.228). However, knee pain severity was highly significant, with all participants reporting moderate or severe pain and experiencing decreased ROM (p<0.001). Statistical significance for continuous variables was determined using the independent t-test or Mann-Whitney U test, as indicated by "a," while categorical variables were analyzed using the Chi-square test or Fisher's exact test, as indicated by "b. (Table 4).

The association between different features and patient satisfaction with the surgical outcome showed various significant associations. Gender did not show a significant association, with n = 19 (90.5%) of females and n = 4 (80.0%) of males reporting satisfaction (p = 1.000). The mean age of satisfied patients was higher (mean = 60.1, SD = 6.5) than that of those who were not satisfied (mean = 55.0, SD = 5.0), but this difference was not statistically significant (p = 0.206). Weight, height and BMI were not significantly associated with satisfaction (p = 0.923, p = 0.220 and p = 0.609, respectively). Education level approached significance, with all participants who had less than a high school education or a bachelor's degree being satisfied, whereas n = 3 (37.5%) of those with a high school education were not satisfied (p = 0.052). Pain severity was not show a significantly associated with satisfaction, although those with moderate pain were less likely to be satisfied (60.0%) compared to those with severe pain n = 11 (91.7%) (p = 0.200) (Table 5).

DISCUSSION

Total knee arthroplasty (TKA) significantly improves mobility, pain and quality of life in patients with end-stage knee osteoarthritis [12,13]. Moreover, Alomran *et al.* [14] assessed the quality of life of post-TKA patients, revealing substantial reductions in pain and enhanced satisfaction. Despite the growing popularity of TKA in Saudi Arabia, particularly in Qassim Province [15], research on patient experience and satisfaction remains limited. Understanding patients' perspectives is crucial for improving surgical methods, rehabilitation and overall patient care. This study aimed to evaluate patient satisfaction, pain levels and physical outcomes after Total Knee Arthroplasty (TKA) in a cohort of 26 patients at a single center.

Notably, our study determined that nearly half of the contributors (n = 12, 46.2%) reported experiencing extreme knee pain post-TKA, while n = 5 (19.2%) reported mild pain as mild and n = 6 (23.1%) reported no pain. These results align with those of previous research, which has consistently highlighted that a significant proportion of TKA patients

continue to experience various levels of pain postoperatively. Lebleu *et al.* [16] reported that up to 25% of patients undergoing knee arthroplasty experienced chronic pain postoperatively. According to a systematic review by Kahlenberg *et al.* [17], patient satisfaction with TKA is closely linked to the extent of pain relief achieved and inadequate pain control is a common source of dissatisfaction. The high percentage of patients in our study reporting excessive pain indicates potential gaps in pain management strategies that need to be addressed to enhance the postoperative outcomes.

Our study also revealed that knee pain significantly interfered with the participants' daily activities. Specifically, n = 11 (42.3%) of participants found it extremely difficult or impossible to perform self-care tasks or get in and out of cars due to knee pain. Kooranian *et al.* [18] showed that joint pain due to knee Osteoarthritis (KOA) can lead to joint impairment. Furthermore, n = 13 (50.0%) of participants found walking down stairs extremely difficult or impossible, indicating substantial functional limitations TKA. These findings are consistent with those of Lützner *et al.* [19], who reported that functional limitations such as difficulty in walking and climbing stairs are common among TKA patients and are closely associated with decreased patient satisfaction.

Regarding ROM, n = 16 (76.2%) of female participants and n = 4 (80.0%) of male participants experienced decreased ROM TKA. Interestingly, our study found that decreased ROM was significantly associated with lower weight, with participants who experienced decreased ROM with a mean weight of 77.05 kg compared to 92.25 kg in those with unaffected ROM (p = 0.029). This finding contrasts with those of previous studies, such as that by Singh *et al.* [20], who did not find any association between BMI and poorer functional outcomes post-TKA. However, it is possible that other factors such as muscle strength and preoperative joint condition play a role in ROM outcomes, suggesting the need for further research to understand the complex interactions between these variables.

Notably, the majority of participants (n = 22, 84.6%) reported feeling "Much Better" following their surgery, indicating a high level of satisfaction. Similarly, Vogel *et al.* [21] showed that patient satisfaction with TKA ranges from 86% to 90%. Satisfaction was not significantly associated with sex, age, weight, height, or BMI. However, education level approached significance, with those having less than a high school education (n = 14, 87.5%) or a bachelor's degree (n = 2, 100%) being more satisfied than those with a high school education (n = 5, 62.5%). This finding is partially supported by the literature; for example, a study by Nakano *et al.* [22] found that lower education levels were associated with higher satisfaction due to lower expectations. This suggests that managing patient expectations may be crucial for improving satisfaction.

Additionally, while pain severity did not show a significant association with satisfaction in our study, there was a trend indicating that those with moderate pain were less likely to be satisfied than those with severe pain. This finding is intriguing and may reflect the complex relationship between pain perception and satisfaction. Similarly, Klem *et al.* [23] showed that post-TKA satisfaction was high when patients experienced no ongoing symptoms or functional limitations, indicating that these factors are key determinants of overall satisfaction. For example, patients with severe pain may experience a more significant contrast between their preoperative and postoperative pain levels, leading to higher satisfaction despite the ongoing pain. This aligns with the findings of Bryan *et al.* [24], who noted that the relative improvement in pain, rather than the absolute level of pain, is a critical determinant of satisfaction.

A comparison of our results with those of previous studies highlighted some consistencies and differences. The high levels of pain and reduced ROM in our cohort echo the findings from similar populations, reinforcing the importance of targeted pain management strategies and rehabilitation programs to improve these outcomes. The significant role of education level in influencing routine task interference and patient satisfaction aligns with broader research emphasizing the importance of the social determinants of health in surgical outcomes. However, our finding of no significant association between BMI and satisfaction contrasts with the bulk of the literature, suggesting that patient perceptions in our cohort might differ from those in other settings. This underscores the need for individualized care plans that consider not only physical factors, but also psychological and social dimensions to optimize patient outcomes.

Implications and Future Directions

Our findings highlight that effective management of symptoms and functional limitations after TKA is crucial for enhancing patient satisfaction. Future research should focus on developing targeted interventions to address these issues, particularly in patients with lower educational levels, who may be at a higher risk of dissatisfaction. Additionally, exploring personalized rehabilitation strategies and long-term follow-up studies could provide deeper insights into optimizing the outcomes and improving the quality of life of patients undergoing TKA.

CONCLUSIONS

Our study underscores the complex interplay between factors influencing patient outcomes following TKA. While pain management and ROM are critical determinants of patient satisfaction, social determinants such as education level also play a significant role. These findings highlight the need for comprehensive, multidisciplinary approaches to postoperative care that address the physical and psychosocial needs of patients. Further research with larger sample sizes and longer follow-up periods is necessary to better understand these relationships and to develop more effective interventions to enhance patient satisfaction and recovery after TKA.

Limitations

Despite the valuable insights gained from this study, there are some limitations. The sample size was relatively small,

which limits the generalizability of the findings. Additionally, the study was cross-sectional, meaning that it captured a snapshot of outcomes at a single point in time rather than tracking changes over time. Future research should include larger, more diverse populations and longitudinal designs to better understand the long-term outcomes of TKA.

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