

How to Cite:

El-Batra, M. M. A., Ebied, A. M., Hasan, B. Z. M., & El-Mohsen Sherif, O. A. (2024). Assessment study of how much Egyptian patients are satisfied following total knee arthroplasty. *International Journal of Health Sciences*, 8(S1), 1995–2009.
<https://doi.org/10.53730/ijhs.v8nS1.15464>

Assessment study of how much Egyptian patients are satisfied following total knee arthroplasty

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Abstract--Background: Advanced stages of Knee OA can be incapacitating as a result of reduced functional range of motion and pain. Joint replacement may be needed for end-stage arthritis. Among the patient-reported outcome measures is patient satisfaction. **Objectives:** To study patients' satisfaction one year later of total knee arthroplasty using different outcome measures and scoring systems. **Patients & Methods:** This was a prospective cohort study that was performed at Menoufia University Hospitals on 132 patients who received primary TKR. All participants were subjected to complete personal and medical history, and general examination including BMI and vital signs (heart, respiratory rate, and blood pressure). Preoperative investigations include CBC, serum creatinine, RBS, Liver function tests), Electrocardiogram, imaging studies such as (knee X-ray, CT, MRI, and bone densitometry). Surgical steps for TKR, postoperative care (hydration, analgesia). Knee joint physiotherapy until discharge. Study tools: Knee Society score, Western Ontario and McMaster Universities Osteoarthritis Index score. Patient satisfaction (The patient is asked if he would recommend total knee replacement for his relatives or not. Visual Analogue Scale). **Results:** The average age of the study group was 58.47±8.037 years, BMI 28.79±1.364 with 78.7% were females. 72.9% of the study group were satisfied with TKR. A statistically significant result was observed between patient age and

postoperative satisfaction of patient among the studied group (p value= 0.011*), Comorbidities and BMI negatively affected postoperative patient satisfaction. **Conclusion:** TKA is a highly satisfactory surgery for treating knee arthritis when compared to its alternatives.

Keywords---Arthroplasty, Joint, Knee, Osteoarthritis, Satisfaction.

Introduction

Knee osteoarthritis (OA) is a prevalence of around 10 % among the general population aged 55 and older in the United States..[1] Knee OA in its advanced stages can cause significant disability as a result of pain and a reduced functional range of motion (ROM).[2] Joint replacement therapy may be necessary for end-stage arthritis, despite the fact that numerous treatment modalities have been developed. [3]

Extensive research has been conducted on the subject of total knee arthroplasty (TKA) outcomes, with the majority of studies focusing on surgeon-reported metrics such as postoperative ROM, restoring mechanical axis, and implant survivorship. Nevertheless, instances frequently arise in which a procedure deemed successful from the surgeon's standpoint fails to meet patient satisfaction As a rule, patients express comparatively lower levels of satisfaction with treatment outcomes than surgeons.[4] Spite notable progressions in surgical technique, patient selection, and implant design, a multitude of studies reveal that patient satisfaction with primary TKA remains between 82 and 89 %. [5-7]

Due to the well-documented discrepancy between clinician and patient assessments of health status, patient satisfaction is an essential outcome measurement. [8]. Multiple studies have identified several factors that are associated with patient dissatisfaction. These factors include knee-related aspects (such as stiffness, pain, function, and inflammation), self-rated aspects (including mental and physical health status, and quality of life), unfulfilled pre-surgery expectations, complications, and patient demographics (e.g., employment status, age, and, gender).[9]

On the basis of preoperative patient characteristics such as radiographic findings, mental health, knee function scores, and socioeconomic status, numerous studies have attempted to forecast patient outcomes. [10, 11] Poor outcomes Causes consist of patellofemoral disorders, infection, poor prosthetic design and positioning, ligament imbalances, periprosthetic fractures, neurovascular complications, chronic pain, and component loosening. [12] While pain relief stands as the paramount postoperative outcome, there is a lack of research examining the natural course of postoperative pain. [13]

The Knee Society Knee Scoring System underwent an update in 2011 to integrate patient-reported outcome assessment scales, including expectations, physical activities, and satisfaction, into the overall rating system. [14] Additional well-

liked PROMs consist of the 36-item Short Form Health Survey (SF-36)[15], the Western Ontario and McMaster Universities Arthritis Index (WOMAC), the 12-item Short Form Health Survey (SF-12), [16], the Knee Injury and OA Outcome Score (KOOS)[17], and the Oxford knee score (OKS). The WOMAC is extensively utilised as a disease-specific metric to assess the efficacy of surgical and non-surgical interventions in patients with OA. The KOOS is a self-administered questionnaire that has been specifically developed to evaluate the efficacy of interventions for injuries to the anterior cruciate ligament and meniscus. For patients with degenerative arthritis, the OKS has been identified as one of the most effective disease-specific measures; it correlates significantly with pain but less with postoperative functioning. [18] This study aimed to study patients' satisfaction after one year of total knee arthroplasty using different outcome measures and scoring systems and try to draw a correlation between their post-operative satisfaction and pre-operative characters.

Patients and Methods

This was a prospective cohort study that was performed at the Institutional Review Board of the Orthopedic Department of Menoufia University Hospitals on 132 patients who received primary TKR in the period from May 2021 to June 2022. This study was done after IRB approval (No: 6/2021ORTH22). All patients gave Written consent. All patients have fulfilled the following criteria:

Inclusion criteria : The patient underwent primary TKA for knee OA.

Revision total knee replacement (TKR) patients or a history of previous knee surgeries were excluded from the study.

All individuals in the study were subjected to complete personal and detailed medical history (history of DM, hypertension), complete physical examination including BMI, vital data), preoperative laboratory investigations including CBC, Liver function tests, random blood sugar, serum area, and creatinine. ECG was done preoperatively on all patients. Imaging studies for knee OA include (plain x-ray anteroposterior, lateral view for the knee joint, bone densitometry, patellofemoral (skyline) view, standing radiographs with the knee extended or in 45° of flexion (Rosenberg view), Magnetic resonance imaging, scanning Computed tomography,). Surgical steps for TKR, postoperative care (hydration, analgesia and knee physio therapy upon discharge). Study tools for evaluation of patient satisfaction after one year of TKR: OKS score, (WOMAC) score, Patient satisfaction (The patient is asked if he would recommend TKR for his relatives or not, Visual Analogue Scale (VAS), Knee ROM.

Statistical analysis

Statistical analysis, data collection, and tabulation were all performed utilising SPSS v26 (IBM Inc., Armonk, NY, USA), The means (\bar{x}), standard deviations (SD), and analytical statistics such as the Student's t-test (t) and Chi-square test (χ^2) were utilised to represent qualitative data, whereas percentages (%) and numbers (No) were employed to represent quantitative data. A difference is deemed non-significant if $P > 0.05$. $P < 0.05$ indicates a significant difference.

Results

This trial included 132 patients who underwent TKR, there were 105 females (79.5%) and 27 males (20.5%) mean age was 57.39 ± 7.67 years and BMI of 28.79 ± 1.364 , 115 patients (87.1%) with moderate social class and 17 patients (12.9%) with low social class, 13(9.8%) patients had DM, 17 (12.9%) patients had hypertension, 11 (8.3%) had DM&HTN, 10 (7.5%) patients had rheumatoid arthritis, 2 (1.5%) had COPD and 20 patients had spinal problems. 96 patients (72.7 %) were satisfied with TKR after 1 year. There was a statistical significance between patient age and postoperative patient satisfaction among the studied group (p-value= 0.011*), as old age negatively affected patient satisfaction, in addition, a p-value of 0.001 indicates a highly statistically significant relationship between BMI and patient satisfaction, since an increased BMI is related to reduced patient satisfaction. While there was a notable difference in satisfaction levels between social classes, no significant difference was observed between males and females in terms of satisfaction. Among patients who were satisfied, a significantly greater percentage had low comorbidities than patients with increased comorbidities (p value <0.001*). Also patients with spinal problems had significantly less satisfaction than those who didn't have p value <0.001* (**Table 1**).

Also, patients who were subjected to TKR due to joint pain and became satisfied after the operation there mean preoperative WOMAC score was 89.6 ± 12.4 while for those who were dissatisfied score was 72.1 ± 22.1 . patients who underwent TKR due to joint stiffness and became satisfied their mean preoperative WOMAC score was 82.6 ± 16.7 while those who were dissatisfied score was 66.2 ± 25.1 . In addition, for patients who underwent TKR due to lack of physical function and became satisfied the mean preoperative WOMAC score was 84.4 ± 14.1 while those who were dissatisfied score was 66.1 ± 22.5 . Also, patients who were dissatisfied after TKR there WOMAC scores were lower than the satisfied group. (**Table 2**)

Baseline, 6 months, and 12 months follow-up of different scores (WOMAC score, OKS score, and VAS score) were illustrated in (**Table 3**). Where significant differences noted in different scores during the period of follow-up.

Low BMI, low blood pressure, and less Vas pain at 6 and 12 months postoperative are significant higher OKS predictors. (**Table 4**)

High Vas pain at 6 and 12 months postoperative are significant predictors of higher WOMAC scores. (**Table 5**).

Table (1): Relation between sociodemographic, clinical data and postoperative patient satisfaction among the studied group (No.=132)

Variable		Satisfied No.=96 (72.7%)	Not satisfied No=36 (27.3%)	P-value
Age (years):	Mean \pm SD	57.39 \pm 7.67	61.36 \pm 8.38	0.011*
	Range	35 - 77	35-80	
Sex	Female	77(80.2)	28(77.8)	0.737

Variable		Satisfied No.=96 (72.7%)	Not satisfied No=36 (27.3%)	P-value
No. (%)	Male	19(19.8)	8(22.2)	
BMI	(Mean \pm SD)	28.46 \pm 0.83	29.66 \pm 2	0.001*
	Range	27-32	26-34	
Social class	Low	9(9.4)	8(22.2)	0.047*
	Moderate	88(90.6)	28(77.8)	
Comorbidities No (%)	None	70 (72.9)	9(25)	<0.001*
	DM	5(5.2)	8(22.2)	
	HTN	11(11.5)	6(16.7)	
	DM&HTN	4(4.2)	7(19.4)	
	RA	5(5.2)	5(13.9)	
Spinal problem	COPD	1(1)	1(2.8)	<0.001*
	Yes	8(8.3)	12(33.3)	
	NO	88(91.7)	24(66.7)	

*P-value statistically highly significant

Table (2): Relation between WOMAC score and postoperative patient satisfaction among the studied group (No.=132)

	Satisfied No.=96	Not satisfied No.=36	P value
	mean \pm SD	mean \pm SD	
Pain	89.6 \pm 12.4	72.1 \pm 22.1	<0.001*
Joint stiffness	82.6 \pm 16.7	66.2 \pm 25.1	<0.001*
Physical function	84.4 \pm 14.1	66.1 \pm 22.5	<0.001*
Pain	43.8 \pm 16.8	41.7 \pm 16.8	0.522
Joint stiffness	40.4 \pm 20.5	39.3 \pm 19.7	0.781
Physical function	42.7 \pm 16.1	41.1 \pm 16.1	0.611

Table (3): Repeated measures of baseline, 6 and 12 months postoperative scores of WOMAC, OKS, eq 5d vas pains, and vas pain scores

Variable		Baseline	6 month postoperative	12 month postoperative	P-value
WOMAC score	Mean \pm SD	80.11 \pm 6.05	47.9 \pm 10.44	32.98 \pm 12.2	<0.001*
	Range	70-92	30 - 72	15 - 62	
	Median (IQR)	79(75.3 -86)	47(40 - 54)	30(23 - 42)	
OKS score	Mean \pm SD	8.09 \pm 3.23	24 \pm 5.11	31.6 \pm 5.86	<0.001*
	Range	2 - 17	12- 33	17 - 40	
	Median (IQR)	9(5 - 11)	24(21 - 28)	33(27 - 36)	
eq 5d vas pains score	Mean \pm SD	16.56 \pm 6.44	50.08 \pm 10.9	65.67 \pm 12.6	<0.001*
	Range	4 -27	25 - 69	35 - 84	
	Median (IQR)	18(10-21.7)	51(44 - 58)	69(56 - 76)	

Variable		Baseline	6 month postoperative	12 month postoperative	P-value
vas pain scores	Mean ± SD	8.36±0.7	5±1.13	3.39±1.27	<0.001*
	Range	7-10	3-8	2-7	
	Median (IQR)	5(8 – 9)	5(4-6)	3(2-4)	

*IQR=Interquartile range *P-value statistically highly significant*

Table (4): Predictors of OKS at 12 months postoperative

Model	Unstandardized Coefficients		Standardized Coefficients	P-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta		Lower Bound	Upper Bound
Age	-.015	.019	-.020	0.439	-.053	.023
BMI	-.220	.106	-.051	0.039*	-.429	-.011
DM	-.703	.453	-.036	0.123	-1.600	.193
HTN	-.822	.388	-.047	0.036*	-1.590	-.055
Both DM&HTN	.253	.479	.012	0.599	-.696	1.201
RA	-.663	.598	-.030	0.269	-1.846	.520
Vas pain at baseline	.015	.211	.002	0.945	-.402	.432
Vas pain at 6 months postoperative	-.413	.188	-.080	0.030*	-.786	-.040
Vas pain at 12 months postoperative	-4.002	.180	-.871	<0.001*	-4.359	-3.646

**P-value statistically significant*

Table (5): Predictors of WOMAC score at 12 months postoperative

Model	Unstandardized Coefficients		Standardized Coefficients	P-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta		Lower Bound	Upper Bound
Age	-.011	.034	-.007	0.746	-.079	.056
BMI	.329	.189	.037	0.084	-.045	.703
DM	.428	.810	.011	0.598	-1.175	2.031
HTN	1.072	.694	.030	0.125	-.301	2.445
Both DM&HTN	-.380	.857	-.009	0.658	-2.076	1.316
RA	-.707	1.069	-.015	0.510	-2.823	1.410
Vas pain at baseline	.480	.377	.028	0.205	-.266	1.226

Model	Unstandardized Coefficients		Standardized Coefficients	P-value	95.0% Confidence Interval for B	
	B	Std. Error	Beta		Lower Bound	Upper Bound
Vas pain at 6 months postoperative	.929	.337	.087	0.007*	.263	1.596
Vas pain at 12 months postoperative	8.460	.322	.887	<0.001*	7.823	9.096

*P-value statistically significant

Discussion

In end-stage knee OA, TKR surgery is regarded as the gold standard treatment due to its high rates of functional and symptomatic improvement and cost-effectiveness. In spite of nearly flawless surgical procedures, as many as 30 % of patients do not experience clinically significant reductions in pain and disability levels following the procedure. These rates of inadequate response underscore the significance of determining and quantifying success with this method in a suitable manner in order to facilitate outcome improvement [19].

Patient satisfaction is regarded as a crucial outcome indicator following TKR; however, the construct itself is complicated. Significant variability exists in both the methodologies employed to assess satisfaction and the estimations provided regarding the percentage of individuals who experience satisfaction following surgery. The instruments and quantification methods utilised to assess patient satisfaction subsequent to TKR are exceedingly diverse, despite the fact that such metrics serve as an indicator of the orthopaedic intervention's value[19].

Our research comprised 132 patients who had received TKR. Patient satisfaction was assessed. A retrospective assessment of patient expectations was conducted one year after the procedure. Patients were presented with a series of responses, including enhanced mobility, decreased pain, and an improved life overall quality. The WOMAC scoring system was employed to evaluate the functional status and severity of symptoms in patients both before and after the operation. The WOMAC scoring system was employed to quantify functional pain, stiffness, and limitation. Before and one year after the operation, the WOMAC pain subscale score had an explicit advantage over the other scoring systems. Also inquired about were patients' preoperative expectations that were fulfilled [20].

In our study, of 132 patients 96 (72.7%) had satisfaction after 1 year of TKR, and 36 (27.3%) had no satisfaction. which is consistent with that reported recently in other studies [21,22].

Despite substantial advancements in primary TKR, several studies have reported that patient satisfaction remains low, with only 82–89 % of individuals expressing

satisfaction. Prior to achieving patient satisfaction following primary TKA, it is critical to exceed patient expectations.[23]

A systematic examination conducted by **Kahlenberg et al. [24]** reports that 83% of studies cited satisfaction levels exceeding 80%, according to the analysis. Patient-reported functional outcome following surgery was the predictor of satisfaction that was most frequently cited.

Also, we found a statistically significant between patient age and postoperative patient satisfaction among the studied group as old age had less satisfaction after TKR. Patients who were 60 years of age or younger reported greater satisfaction with the results of TKA, according to **Noble et al.[25]**. As reported by **Scott et al. [26]**, Younger patients were more likely to express satisfaction with the treatment outcomes as a result of reporting that their expectations were satisfied following surgery. Conversely, **Williams et al. [27]** documented that patient satisfaction among individuals aged below 55 years was notably low. Younger patients exhibited a higher prevalence of residual symptoms and functional deficits, as described by **Parvizi et al.[28]**. According to a study by **Von Keudell et al.[29]**, patients below the age of 55 reported greater satisfaction with ROM, kneeling, and postoperative pain following unicompartmental knee arthroplasty. Conversely, patients older than 65 reported greater satisfaction with TKA. Therefore, determining whether age is predictive of the outcome of TKA is challenging. Functional recovery subsequent to TKA seems to be influenced more by biological age as opposed to chronological age.

We also found a statistically significant between patient BMI and postoperative patient satisfaction among the studied group. A higher BMI was associated with a diminished increase in satisfaction scores, suggesting that the most obese patients were more cognizant of the operated joint during physical activity. The BMI category was reported to be associated with treatment satisfaction, with obese patients reporting lower levels of satisfaction. **Giesinger et al. [30]** in their study, collected Data from 1565 patients. There was improvement in all outcome measures between the preoperative and 12-month follow-up periods. When compared in pairwise manner to normal-weight patients, individuals classified as obese classes I-II demonstrated a more substantial enhancement in both the WOMAC function and total score. Pain reductions were greater across all three obesity classes according to WOMAC. In obese patients, postoperative improvements in joint-specific outcomes were more pronounced than in patients of normal weight. One year after surgery, these results indicate that obese patients may experience the greatest functional and pain relief benefits from TKA. **Baghbani-Naghadehi et al. [31]** performed a retrospective study about "Does obesity influence outcomes reported by patients after TKA?" Patients in all BMI groups who underwent TKA reported improvements in pain, function, and stiffness, the researchers discovered. Patients who were categorised as obese by BMI reported comparable advantages to those who were classified as normal weight.

We found insignificant difference between females and males in satisfaction. **Bonnin and Archbold, [32]** discovered that female TKA patients suffer from

residual pain and stiffness at a higher rate. Regarding whether gender serves as a predictor of patient satisfaction, however, this has not been adequately established. According to social class, we found a statistical difference in the relation between the social class of the patient and postoperative satisfaction. Patient with moderate social class is satisfied more than patient with low class. **Keurentjes et al.[33]** found that After TKR, Patients with greater levels of education exhibited a more substantial enhancement in their role-physical functioning.

In a multitude of studies, comorbidities have been identified as a predictor of patient dissatisfaction following TKA[26] shown that pain in the other joints or the back prior to surgery was significantly associated with postoperative dissatisfaction.[34] Patients with medical or psychological comorbidities reported experiencing more severe postoperative pain.[35] The incidence of pain or functional disability following TKA was found to be higher among patients with medical comorbidities. [36] Individuals with diabetes or pulmonary disease exhibited a greater incidence of limited mobility following TKA. Controversy surrounds the effect of medical comorbidities on patient satisfaction following TKA. The authors of one study discovered that medical comorbidities had no effect on satisfaction[37].

In this research, we reported a significantly higher percentage of low comorbidities patients among patients who are satisfied, as opposed to those who have a greater number of comorbidities. Comorbidities affecting the musculoskeletal system, including back disability and lower extremity pain, have a significant effect on patient satisfaction following TKA. 89 of 97 satisfied patients didn't complain of any spinal pain. 24 of 36 dissatisfied patients were complaining of spinal problems. These musculoskeletal comorbidities frequently impede patient function and diminish the therapeutic benefits of TKA. Additionally, the findings of **Ayres et al.[38]** observed that corroborate this claim. Back disability and other LE painful joints were found to be significant predictors of dissatisfaction following TKA.

Back pain has been identified in prior research as an indicator of early dissatisfaction. One year that after TKA, patients with back pain were less satisfied. [26]. Our results showed that patients who underwent TKR due to joint pain and became satisfied after the operation there a mean preoperative WOMAC score was 89.6 ± 12.4 while those who were dissatisfied score were 72.1 ± 22.1 . as well patients who underwent TKR due to joint stiffness and became satisfied there mean preoperative WOMAC score was 82.6 ± 16.7 while who are dissatisfied score was 66.2 ± 25.1 . in addition, for patients who underwent TKR due to lack of physical function and became satisfied the mean preoperative WOMAC score was 84.4 ± 14.1 while for those who were dissatisfied score was 66.1 ± 22.5 . So, we found that patients who were dissatisfied after TKR with their WOMAC scores were lower than the satisfied group. We declared that the most common postoperative cause of dissatisfaction among the studied group according to WOMAC was postoperative pain. 18 patients out of a total of 36 dissatisfied complained and said that pain was the cause of their dissatisfaction.

10 patients went to the physical function as a cause of dissatisfaction while 8 on their questionnaires declared that joint stiffness was their cause.

Controversy surrounds the relationship between preoperative knee pain and function and patient satisfaction following TKA. Patients with worse knee pain and function at baseline were more likely to be dissatisfied at one year, according to some studies [39,40]. However, other studies found no correlation between preoperative pain and function and patient satisfaction after TKR. [41,42]

Lower preoperative knee pain and function scores were significantly associated with dissatisfaction, according to **Ayers et al.[38]** Additionally, patients with minimal functional impairment prior to the procedure were less likely to express dissatisfaction than those with severe functional impairment. A consensus exists, on the other hand, that dissatisfaction following TKA is predicted by lower score improvements from baseline scores or worse postoperative pain and function scores. [39, 43, 44]

Poorer scores on postoperative knee function and pain were significantly associated with dissatisfaction, according to **Ayeres et al.[38]**. After five years, around 80% of patients who received TKA and reported pain scores below 50 expressed dissatisfaction. In a comparable vein, the dissatisfied patients exhibited significantly diminished PROM changes from their baseline to 5-year scores when compared to the satisfied patients.

Also, our study found that regarding follow-up of different scores at baseline, 6 months, and 12 months after TKR. There were significant differences in WOMAC score, OKS score, and VAS as there was significant improvement of these scores at 6 and 12 months in comparison with baseline scores. The findings of the study align with **Escobar et al.[45]** who showed that there was a significant improvement in WOMAC score in all domains after 6 months of TKR. Also **Marques et al.[46]** found that WOMAC score was improved in total and subscores in the follow-up period for 3 and 12 months after TKR. Here OKS score was improved from 8.09 to 31.6 preoperative and 1 year after TKR. This is in accordance with the research of **Yap et al.[47]** whose research determined that the change in median OKS for the TKR cohort from 16.4 to 34.0 between pre-operative and post-operative time points was statistically significant (95 % CI 14.0, 15.7). Other studies reported that early postoperative OKS scores can predict patient satisfaction after TKR.[48,49]. Also found that the OKS score was significantly improved after 6 months and 2 years after TKR. The findings of **Van der Wees et al.[50]** found that health outcomes had been reported by patient in the form of WOMAC score and VAS score were significantly enhanced after 3, 6, and 12 months of TKR. Also, we found that low BMI, low blood pressure, and less VAS pain at 6 and 12 months postoperative are significant predictors of higher OKS, and high VAS pain at 6 and 12 months postoperative are significant predictors of higher WOMAC score. The study by **Kuklinski et al.[51]** found that the preoperative WOMAC total score was the most reliable indicator of WOMAC score improvement at 12 months FU among patients who underwent TKR. Also **Lindner et al. [52]** reported Predictors of WOMAC scores 12 weeks post-surgery in TKA were predominately WOMAC baseline scores. **Yap et al.[47]** found that

Pre-operative the adjusted effect size for OKS was the largest, with a lower pre-operative OKS value being associated with a greater change in OKS (improvement). Sex also demonstrated a negative relationship, with women experiencing the most significant change in OKS. Age reported a positive association, so younger patients demonstrated minimal OKS improvement, and conversely. The study of **Clement et al. [53]** found that on both unadjusted and multivariate analyses, patients without diabetes mellitus and those with a better preoperative OKS, a worse 6-month OKS, and a better EQ-5D at 6 months were significantly more likely to experience a greater improvement in the OKS from 6 to 12 months. Diabetes mellitus was the only comorbidity that did not exhibit an association with the change in the OKS between the sixth and twelfth months. A significant trend emerged whereby a lower BMI was associated with a more pronounced change in the 6-month to 12-month OKS, even after controlling for confounding variables. An enhanced preoperative OKS was associated with a more pronounced rise in the OKS between six and twelve months. **Sanchez-Santos et al [54]** Found that at the 12-month follow-up, an increasing deprivation score and BMI were associated with a decreasing OKS (function/worse pain).

Limitations: Slightly was the sample size, to begin with. Furthermore, there is a possibility that our data would not accurately reflect the characteristics of the entire population, thereby increasing the likelihood of human error. Furthermore, in the absence of a preoperative evaluation of patient expectations, we solely assessed them by inquiring whether they had been fulfilled. We did not analyse demographic or clinical data. Also, in our investigation, we strictly compared diverse scoring systems in order to identify potential predictors of various facets of patient satisfaction. Additionally, patient satisfaction was evaluated one year following TKA. A longer follow-up period would have been a prudent course of action, given that the quality of satisfaction may be enhanced and the perception and experience of pain and function may continue to improve.

Conclusion

Orthopedic surgeons recognize TKA as a highly satisfactory surgery for treating knee arthritis when compared to its alternatives. Divergences in patient-surgeon satisfaction are frequently observed; patients frequently express lower levels of satisfaction with the results compared to the surgeons' initial expectations. This underscores the necessity for the development of patient satisfaction measures that are more objective in nature. Patient satisfaction can be improved by enhancing factors that a surgeon has control over. Patient's preconceived notions about surgery are strongly linked with how content they will be after the procedure – unmet expectations often equal dissatisfaction.

References

1. Petersson IF. Occurrence of osteoarthritis of the peripheral joints in European populations. *Annals of the rheumatic diseases*. 1996;55(9):659.
2. Dieppe PA, Cushnaghan J, Shepstone L. The Bristol 'OA500' study: progression of osteoarthritis (OA) over 3 years and the relationship between

- clinical and radiographic changes at the knee joint. *Osteoarthritis and Cartilage*. 1997;5(2):87-97.
3. Fraenkel L, Bogardus ST, Concato J, Wittink DR. Treatment options in knee osteoarthritis: the patient's perspective. *Archives of internal medicine*. 2004;164(12):1299-304.
 4. Matsuda S, Kawahara S, Okazaki K, Tashiro Y, Iwamoto Y. Postoperative alignment and ROM affect patient satisfaction after TKA. *Clinical Orthopaedics and Related Research®*. 2013;471(1):127-33.
 5. Anderson JG, Wixson RL, Tsai D, Stulberg SD, Chang RW. Functional outcome and patient satisfaction in total knee patients over the age of 75. *J Arthroplasty*. 1996;11:831-840.
 6. Chesworth BM, Mahomed NN, Bourne RB, Davis AM. Willingness to go through surgery again validated the WOMAC clinically important difference from THR/TKR surgery. *J Clin Epidemiol*. 2008;61:907-918.
 7. Dunbar MJ, Robertsson O, Ryd L, Lidgren L. Appropriate questionnaires for knee arthroplasty. Results of a survey of 3600 patients from the Swedish Knee Arthroplasty Registry. *J Bone Joint Surg Br*. 2001;83:339-344.
 8. Janse AJ, Gemke RJ, Uiterwaal CS, Tweel I, Kimpfen JL, Sinnema G. Quality of life: patients and doctors don't always agree: a meta-analysis. *J Clin Epidemiol*. 2004;57:653-661.
 9. Judge A, Arden NK, Cooper C, Kassim Javaid M, Carr AJ, Field RE, et al. Predictors of outcomes of total knee replacement surgery. *Rheumatology*. 2012;51(10):1804-13.
 10. Dowsey MM, Dieppe P, Lohmander S, Castle D, Liew D, Choong PF. The association between radiographic severity and pre-operative function in patients undergoing primary knee replacement for osteoarthritis. *The Knee*. 2012;19(6):860-5.
 11. Baert IA, Staes F, Truijien S, Mahmoudian A, Noppe N, Vanderschueren G, et al. Weak associations between structural changes on MRI and symptoms, function and muscle strength in relation to knee osteoarthritis. *Knee Surgery, Sports Traumatology, Arthroscopy*. 2014;22(9):2013-25.
 12. Bourne RB, Chesworth BM, Davis AM, Mahomed NN, Charron KD. Patient satisfaction after total knee arthroplasty: who is satisfied and who is not? *Clinical Orthopaedics and Related Research®*. 2010;468:57-63.
 13. Vaienti E, Scita G, Ceccarelli F, Pogliacomi F. Understanding the human knee and its relationship to total knee replacement. *Acta Bio Medica: Atenei Parmensis*. 2017;88(Suppl 2):6.
 14. Scuderi GR, Bourne RB, Noble PC, Benjamin JB, Lonner JH, Scott WN. The new Knee Society Knee Scoring System. *Clin Orthop Relat Res*. 2012;470:3-19.
 15. Stewart AL, Hays RD, Ware JE., Jr The MOS short-form general health survey: reliability and validity in a patient population. *Med Care*. 1988;26:724-735.
 16. Bellamy N, Buchanan WW, Goldsmith CH, Campbell J, Stitt LW. Validation study of WOMAC: a health status instrument for measuring clinically important patient-relevant outcomes to antirheumatic drug therapy in patients with osteoarthritis of the hip or knee. *J Rheumatol*. 1988;15:1833-1840.

17. Roos EM, Roos HP, Lohmander LS, Ekdahl C, Beynnon BD. Knee Injury and Osteoarthritis Outcome Score (KOOS): development of a self-administered outcome measure. *J Orthop Sports Phys Ther.* 1998;28:88–96.
18. van Hove RP, Brohet RM, van Royen BJ, Nolte PA. High correlation of the Oxford knee score with postoperative pain, but not with performance-based functioning. *Knee Surg Sports Traumatol Arthrosc.* 2015 Mar 29; doi: 10.1007/s00167-015-3585-9.
19. Klem NR, Kent P, Smith A, Dowsey M, Fary R, Schütze R, et al. Satisfaction after total knee replacement for osteoarthritis is usually high, but what are we measuring? A systematic review. *Osteoarthritis and Cartilage Open*,2020; 2(1):100032.
20. Thambiah, Nathan, Seow, Liang S, Lingaraj K. Patient satisfaction after total knee arthroplasty. *An Asian Perspective Singapore medical journal*, 2015;56:259.
21. Khatib. Y, Badge. H, Xuan. W, et.al. Patient satisfaction and perception of success after total knee arthroplasty are more strongly associated with patient factors and complications than surgical or anaesthetic factors. *Knee Surg Sports Traumatol Arthrosc*,2020;28:56–63.
22. Farooq. H DE, Ziembra-Davis.M, et.al. Predictors of patient satisfaction following primary total knee arthroplasty: results from a traditional statistical model and a machine learning algorithm. *J Arthroplast*,2020;35(11):23–30.
23. Bourne RB, Chesworth, B.M, Davis, A.M, al. e. Patient Satisfaction after Total Knee Arthroplasty: Who is Satisfied and Who is Not?. *Clin Orthop Relat Res* 2010; 468:57–63.
24. Kahlenberg CA NB, McLawhorn AS, Cross MB, Cornell CN, Padgett DE. Patient Satisfaction After Total Knee Replacement: A Systematic Review. *HSS J*14(2). 2018: 192-201.
25. Noble PC CM, Cook KF, Mathis KB. Patient expectations affect satisfaction with total knee arthroplasty. *Clin Orthop Relat Res*; 2006;452:35–43.
26. Scott CEH, Bugler KE, Clement ND, MacDonald D, Howie CR, Biant LC. Predicting dissatisfaction following total knee replacement: a prospective study of 1217 patients. *J Bone Joint Surg Br*; 2010;92:1253–8.
27. Williams DP PA, Beard DJ, Hadfield SG, Arden NK, Murray DW, Field RE. The effects of age on patient-reported outcome measures in total knee replacements. *Bone Joint J.* 2013; 95:38–44.
28. Parvizi J NR, Berend KR, Lombardi AV, Jr, Ruh EL, Clohisy JC, Hamilton WG, Della Valle CJ, Barrack RL. The effects of age on patient-reported outcome measures in total knee replacements. *Bone Joint J*;95-B. 2013:38–44.
29. Von Keudell A SS, Collins J, Minas T, Fitz W, Gomoll AH. Patient satisfaction after primary total and unicompartmental knee arthroplasty: an age-dependent analysis. *Knee.* 2014; 21:180–4
30. Giesinger K GJ, Hamilton DF, Rechsteiner J, Ladurner A. Higher body mass index is associated with larger postoperative improvement in patient-reported outcomes following total knee arthroplasty. *BMC Musculoskelet Disord*, 2021; 22(1):635.
31. Baghbani-Naghadehi F A-OS, Prado CM, Gramlich L, Woodhouse LJ. Does obesity affect patient-reported outcomes following total knee arthroplasty? *BMC Musculoskelet Disord.* 2022; 23(1):55.

32. Bonnin MP BL, Archbold HA. What are the factors of residual pain after uncomplicated TKA? *Knee Surg Sports Traumatol Arthrosc.* 2011; 19(9):1411-7.
33. Keurentjes JC, Blane D, Bartley M, Keurentjes JJ, Fiocco M, Nelissen RG. Socio-economic position has no effect on improvement in health-related quality of life and patient satisfaction in total hip and knee replacement: a cohort study. *PLoS One.* 2013;8(3):e56785.
34. Singh JA, and David G. Lewallen. Medical and psychological comorbidity predicts poor pain outcomes after total knee arthroplasty. *Rheumatology,* 2013;52(5):916-23.
35. Wylde V, Dieppe, P, Hewlett, S, Learmonth, I. D. Total knee replacement: is it really an effective procedure for all? *The Knee,*2007; 14(6):417-23.
36. Fisher DA, Dierckman B, Watts MR, Davis K. Looks good but feels bad: factors that contribute to poor results after total knee arthroplasty. *The Journal of Arthroplasty,* 2007;22(6):39-42.
37. Gandhi R, Davey JR, Mahomed N. Patient expectations predict greater pain relief with joint arthroplasty. *The Journal of Arthroplasty,* 2009;24(5):716-21.
38. Ayers DC, Yousef, M, Zheng, H, Yang, W, Franklin, P. D.. The prevalence and predictors of patient dissatisfaction 5 years following primary total knee arthroplasty. *The Journal of Arthroplasty,* 2022;37(6): S121-S8.
39. Bourne RB, Chesworth, B. M, Davis, A. M, Mahomed, N. N, Charron, K. D. Patient satisfaction after total knee arthroplasty: who is satisfied and who is not? *Clinical Orthopaedics and Related Research®.* 2010; 468:57-63.
40. Clement ND, Bardgett, M, Weir, D, Holland, J, Gerrand, C, Deehan, D. J. Three groups of dissatisfied patients exist after total knee arthroplasty: early, persistent, and late. *The bone joint.* 2018;100(2):161-9.
41. Halawi MJ, Jongbloed, W, Baron, S, Savoy, L, Williams, V. J, Cote, M. P. Patient dissatisfaction after primary total joint arthroplasty: the patient perspective. *The Journal of Arthroplasty,*2019; 34(6):1093-6.
42. Jacobs CA, Christensen, C. P, Karthikeyan, T. Patient and intraoperative factors influencing satisfaction two to five years after primary total knee arthroplasty. *The Journal of Arthroplasty,*2014; 29(8):1576-9.
43. Baker PN, Van der Meulen, J. H, Lewsey, J, Gregg, P. J. The role of pain and function in determining patient satisfaction after total knee replacement: data from the National Joint Registry for England and Wales. *The Journal of bone and joint surgery British volume.* 2007; 89(7):893-900.
44. Nilsson AK, Toksvig-Larsen, S, Roos, E. M. Knee arthroplasty: are patients' expectations fulfilled? A prospective study of pain and function in 102 patients with 5-year follow-up. *Acta orthopaedica.* 2009;80(1):55-61.
45. Escobar A, Quintana JM, Bilbao A, Aróstegui I, Lafuente I, Vidaurreta I. Responsiveness and clinically important differences for the WOMAC and SF-36 after total knee replacement. *Osteoarthritis Cartilage.* 2007 Mar;15(3):273-80.
46. Marques CJ, Pinnschmidt HO, Bohlen K, Lorenz J, Lampe F. TKA patients experience less improvement than THA patients at 3 and 12 months after surgery. A retrospective observational cohort study. *J Orthop.* 2020 Sep 17;21:517-522.
47. Yap YYW, Edwards KL, Soutakbar H, Fernandes GS, Scammell BE. Oxford knee score 1 year after TKR for osteoarthritis with reference to a normative

- population: What can patients expect? *Osteoarthr Cartil Open*. 2021 Feb 22;3(2):100143.
48. Goh GS, Bin Abd Razak HR, Tay DK, Lo NN, Yeo SJ. Early post-operative Oxford knee score and Knee Society score predict patient satisfaction 2 years after total knee arthroplasty. *Arch Orthop Trauma Surg*. 2021 Jan;141(1):129-137.
 49. Clement ND, Afzal I, Liu P, Phoon KM, Asopa V, Sochart DH, Kader DF. The Oxford Knee Score is a reliable predictor of patients in a health state worse than death and awaiting total knee arthroplasty. *Arthroplasty*. 2022 Aug 3;4(1):33.
 50. Van der Wees PJ, Wammes JJ, Akkermans RP, Koetsenruijter J, Westert GP, van Kampen A, Hannink G, de Waal-Malefijt M, Schreurs BW. Patient-reported health outcomes after total hip and knee surgery in a Dutch University Hospital Setting: results of twenty years clinical registry. *BMC Musculoskelet Disord*. 2017 Mar 3;18(1):97.
 51. Kuklinski D, Marques CJ, Bohlen K, Westphal KC, Lampe F, Geissler A. Thresholds for meaningful improvement in WOMAC scores need to be adjusted to patient characteristics after hip and knee replacement. *J Orthop*. 2022 Jan 15;29:50-59. Doi: 10.1016/j.jor.2022.01.002. PMID: 35125779; PMCID: PMC8803617.
 52. Lindner M, Nosseir O, Keller-Pliessnig A, Teigelack P, Teufel M, Tagay S. Psychosocial predictors for outcome after total joint arthroplasty: a prospective comparison of hip and knee arthroplasty. *BMC Musculoskelet Disord*. 2018 May 22;19(1):159.
 53. Clement ND, Ng N, MacDonald D, Scott CEH, Howie CR. One-year Oxford knee scores should be used in preference to 6-month scores when assessing the outcome of total knee arthroplasty. *Knee Surg Relat Res*. 2020 Aug 28;32(1):43 .
 54. Sanchez-Santos MT, Garriga C, Judge A, Batra RN, Price AJ, Liddle AD, Javaid MK, Cooper C, Murray DW, Arden NK. Development and validation of a clinical prediction model for patient-reported pain and function after primary total knee replacement surgery. *Sci Rep*. 2018 Feb 21;8(1):3381 .