Patient Satisfaction after Total Knee Replacement Regarding pain and function

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Abstract:

Background: Total Knee Replacement is one of the most successful and effective surgical option to reduce pain and restore function for patients with severe osteoarthritis of the knee.

Objectives: To evaluate the result of Total Knee Replacement regarding patient's satisfaction in treating osteoarthritis of the knee.

Patients and methods: A prospective cohort study was conducted at AL-Yarmouk teaching hospital from December 2014 to June 2016 in which forty-four patients with late stage knee OA who underwent TKR were included in the study. Outcomes was assessed according to OKS questionnaire. Participant demographics and baseline characteristics and presence of comorbidities were recorded. Then the results were recorded accordingly.

Results: Among forty-four Total Knee Replacement performed, 84.09% resulted in patient satisfaction at three months post operatively, which increased to 93.1% at six months after surgery.

Conclusion: Total Knee Replacement is useful technique for reducing pain and restoring good function for the joint.

Keywords: Knee joint, total knee replacement, osteoarthritis, patient satisfaction

Introduction;

Osteoarthritis (OA) is a type of joint disease that results from breakdown of joint cartilage and underlying bone [(1)]. The most common symptoms are joint pain and stiffness. Other symptoms may include joint swelling and decreased range of motion. The most commonly involved joints are those near the ends of the fingers, at the base of the thumb, neck, lower back, knee and hips. Usually the symptoms come on over years. It can affect work and normal daily activities [(2)]. OA of the knee is a relatively common condition that affects approximately 10% of the general population above the age of 55 years, the later stages of OA of the knee can be debilitating due to pain and a decrease in the functional range of motion [(3-5)]. While many methods of treatment have been developed to address this condition, total knee Replacement (TKR) is an effective way to manage end-stage knee OA as it had been shown to alleviate pain and improve function.[(6-11)], The greatest improvement is reported within the first six months after surgery [(12,13)]. Knowledge of which factors contribute to patient satisfaction can be incorporated in the care for TKR patients; preoperative and postoperative factors can be used for this purpose. Satisfaction is reported to be associated with self-reported quality of life variables, preoperative mental functioning, expectations and fulfillment of expectations, postoperative pain, and joint stiffness [(14-17)]. Lau et al.[(18)] suggested that following two perspectives, internal determinants and external components should be considered in the evaluation of patient satisfaction. Patient satisfaction after TKR has been described as ranging from 75% to 92% based on a review of the Swedish Knee arthroplasty registry.

Patient satisfaction measurement Tools: Many tools had been used to measure patient satisfaction after TKR like; Knee Society Clinical Rating System (1989), Knee Society Knee Scoring System (2011), 36-item Short Form Health Survey, the 12-item Short Form Health Survey, the Western Ontario and McMaster Universities Arthritis Index (WOMAC), the Knee injury and OA Outcome Score (KOOS), and the Oxford knee score (OKS) .In United Kingdom, the most recognizable orthopaedic (PROMs) are Oxford Hip and Knee Scores (OKS) These were developed in late 1990 to assess patients perception of pain and physical function and have been used in clinical trials local service evaluation and national registries[(19-22)].

The OKS are typically administered in pen and paper fashion, some centers are piloting the use of tablet computers in the clinic waiting room in efforts to ease the processing burden and reduce the loss to follow up associated with paper based postal surveys. It is a patient-administered questionnaire which explores a subjective assessment of their pain and functional capacity.

It is administered as a 12-part questionnaire, with five questions relating to the measurement of pain (question 1, 4, 5, 8, 9), and seven to the assessment of function (question 2, 3, 6, 7, 10, 11, 12) (Table 1).The answer to each question is rated on a scale ranging between 1 and 5, with lower scores indicating more severe problems. The scores for each question are added to generate an overall score of between 12 and 60. An updated scoring method is also used, whereby each item is scored between 0 (worst outcome) and 4

(best outcome), to provide an overall score between 0 and 48 [24-25]. The OKS was chosen because it is a reliable, valid and responsive outcome measurement, it is simple, easy to administer and suitable for following up patients in the long term. It has been recommended as an appropriate disease-specific tool for assessing outcomes after TKR [23-24].

the study. Operations were done under general or spinal anesthesia with the use of medial Para patellar incision and the Zimmer system with posterior cruciate ligament scarifying (PS) implants were used. All patients were asked to fill questionnaires at 3rd and 6th month post operatively to assess outcomes and satisfaction. The OKS questionnaire was categorized to that related to pain and function separately (Table 1), five questions for pain and seven for function were added together. In order to allow a meaningful comparison between the total scores for pain and function, scoring from 0 to 12 was considered bad or poor outcome, scoring from 13 to 24 was considered weak, and scoring from 25 to 36 was considered good and that from 37 to 48 was considered excellent outcome. Participant demographics and baseline characteristics and presence of comorbidities were recorded.

Inclusion criteria: Patients who underwent TKR for late-stage OA of the knee fig 1.

Exclusion criteria: Patients with inflammatory arthritis and patients with history of previous TKR or tibial or femoral osteotomy.

Statistical analysis: Statistical calculation were performed using SPSS Statistics version 20.

1. Each patient assigned a serial identification number.
2. The data were represented by mean standard deviation. At 6th month post operatively the same procedure was done by asking patients to fill second follow up questionnaire. Satisfaction rate increase to (93.18%). Also the sex of participant did not affect the level of satisfaction. The.
3. The categorical data presented as frequency and percentage tables. Chi square test was used to assess the association between variables accordingly.
4. Those who reported "poor" or "weak" OKS were categorized as "not satisfied" and those who were either "good" or "excellent" OKS were categorized as "satisfied". **Results**:

Forty-four patients underwent TKR during the period from December 2014 to June 2016 were included in the present study.

The mean age of patients was 58year mean ± SD; 58.07±7.49. Of those 44 patient, 36 (81.8%) were females and 8(18.2%) were males, 20 patients had history of chronic medical disease; 16 were having hypertension (HT) and 4 diabetes mellitus (DM) (table-2). Patients asked to fill questionnaire at 3rd post-operative months to assess patient satisfaction according to OKS. We found that 37 patients; (84.09%) were satisfied, and 7 of them; (15.91%) were not satisfied. The high rate of satisfaction occurs at age group of less than 60 years which was (47.72%). Sex of participants was found not to affect the results. The presence of DM affects patient satisfaction, while the presence of HT had no effect on satisfaction (Table_ 3)

Patients and methods:

A prospective cohort study was conducted at AL-Yarmouk teaching hospital from December 2014 to June 2016 in which forty-four patients with late stage knee OA who underwent TKR were includedin t-test was run to assess the difference in means between OKS after 3 months and 6 months, the results had shown to be statistically significant (P-value = 0.0000, t = 35.486, df=43) (Table 5)

Table I. Breakdown of the Oxford knee score [26]

Name	
Date	
Wright or left knee	
1- How you describe pain you have Usually from your knee:? non 4 V. mild 3 Mild 2 Mild to severe 1 Severe 0 2- have you had any trouble with washing or drying all over because of your knee? No trouble at all 4 v. Little trouble 3 moderate trouble 2 extreme difficulty 1 impossible 0 3- How had any trouble getting in or out of the car because of your knee? No trouble 4 v. little trouble 3 moderate trouble 2 Extreme difficulty 1 Impossible 0 4- if you have to kneel down could you stand up afterwards? Yes easily 4 With little difficulty 3 With moderate difficulty 2 With extreme difficulty 1 Impossible 0 5- How you have been limping because of your knee? Rarely/never 4 Sometimes or just at first 3 Often or at first 2 Most of the time 1 All the time 0 6- Have you felt your knee suddenly give way or let you down? Rarely/never 4 Sometimes or just at first 3 Often /not just at first 2 Most of the time 1 All of the time 0	7- Have you been able to do your Household shopping on your own? Yes easily 4 With little difficulty 3 With moderate difficulty 2 With extreme difficulty 1 No impossible 0 8- for how long have you been able befor the pain of your knee become severe? No pain even after more than 30 min 4 16-30 min 3 5-15 min 2 Around the house only 1 An able to walk all 0 9- Have you been able to walk a flight of a stair? Yes easily 4 With little difficulty 3 With moderate difficulty 2 With extreme difficulty 1 No impossible 0 10 – After a meal how painful has it been to stand up of a chair because of your knee? Not at all painful 4 Slightly painful 3 Moderately painful 2 v. painful 1 Unbearable 0 11- how much pain from your knee interfere with your work? Not at all 4 A little bit 3 Moderately 2 Greatly 1 Totally 0 Have you been troubled by pain from your knee at night? No nights 4 Only 1-2 nights 3 Some nights 2 Most nights 1 every nights 0 total score 48

Table 2: Characteristics of the study population

category	Number
Age/ years	
< 60 years	24 54.5%
60-69	18 40.9%
=>70 years	2 4.5%
Total	44 100%
Mean± SD	58.07±7.494
Gender	
Male	8 18.2%
Female	36 81.8%
Total	44 100%
HT	
No	28 63.6%
Yes	16 36.4%
Total	44 100%
DM	
No	40 90.9%
Yes	4 9.1%
Total	44 100%

Table 3: Patient satisfaction according to age, gender and comorbidity at 3rd month post operatively.

	OKS category after 3 months association between satisfaction and presence of DM after 6 months post operatively had the same importance like that after 3 months while HT had no role in affecting patient satisfaction			
category		Dissatisfied	Satisfied	Total	P-value
age	< 60	3 6.8%	21 47.64%	24 54.54%	0.007
	60-69	4 9.1%	14 31.74%	18 40.9%	
	=>70	0 0%	2 4.54%	2 4.54%	
	Total	7 15.9%	37 84.1%	44 100%	
gender	Male	0 0%	8 18.18%	8 18.18%	0.129
	Female	7 15.9%	29 65.9%	36 81.81%	
	Total	7 15.9%	37 84.09%	44 100%	
HT	No	4 9%	24 54.54%	28 63.64%	0.922
	Yes	3 6.81%	13 29.54%	16 36.36%	
	Total	7 15.9%	37 84%	44 100%	

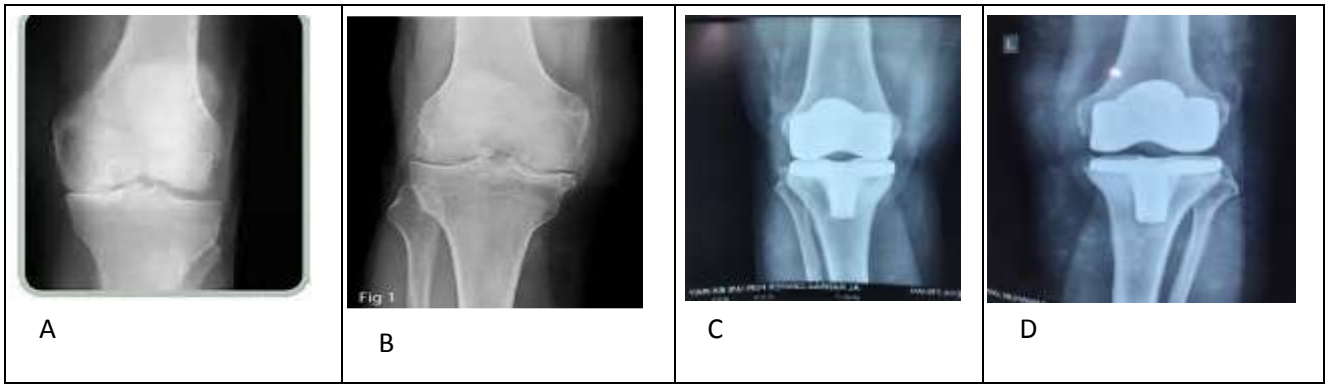
DM	No	4 9%	36 81.81%	40 90.9%	0.001
	yes	3 6.81%	1 2.27%	4 9.09%	
	Total	7 15.9%	37 84.1%	44 100%	

Table 4: Patient satisfaction according to age, gender and comorbidity at 6th month post operatively.

	OKS category after 6 months				
Category		Dissatisfied	Satisfied	Total	P-Value
Age	< 60	0 0%	24 54.54%	24 5454%	0.098
	60-69	3 6.82%	15 34.08%	18 40.9%	
	=>70	0 0%	2 4.54%	2 4.54%	
	Total	3 6.82%	41 93.18%	44 100%	
gender	Male	0 0%	8 18.18%	8 18.19%	0.398
	Female	3 6.81%	33 75.00%	36 81.8%	
	Total	3 6.82%	41 93.18%	44 100%	
HT	No	3 6.82%	25 56.81%	28 63.63%	0.175
	Yes	0 0%	16 36.37%	16 36.37%	
	Total	3 6.82%	41 93.18%	44 100%	
DM	No	1 2.28%	39 88.64%	40 90.92%	0.000
	yes	2 4.54%	2 4.54%	4 9.08%	
	Total	3 6.82%	41 93.18%	44 100%	

Table 5 t-test show the difference of OKS at 3 and 6 months. One-Sample Test

	Test Value = 0					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
OKS After 3 months post op	35.486	43	.000	30.636	28.90	32.38
OKS After 6 months post op	49.832	43	.000	42.000	40.30	43.70



Picture 1; A and B ; severe OA knee, B and C; TKR

Discussion:

OA of the knee is a relatively prevalent condition that can progress to a point where it starts to be debilitating, It adversely affects the patient's quality of life due to pain and function limitation. In this regard, TKR has been shown to be safe and effective in addressing end-stage OA of the knee. This procedure is common due to its effectiveness in alleviating pain and improving function, and will continue to play a key role in the management of OA. While TKR has been touted as an effective treatment modality, several studies have reported that not all patients are satisfied with it [3-27].The present study shows that patient satisfaction is correlated with post-operative OKS. Robertsson *et al*. [17] reported a correlation between satisfaction and improvement in both pain and function outcomes. In a study by Yuan et al patient satisfaction rate was 91%. [], the study of Nunez et al that involving 112 patients, they reported 86% satisfaction rate. [28] The results of the present study are consistent with those results. Noble *et al* [15] reported satisfaction rate of 75% which is far from our results, this might be due to different age group he included.Regarding age, we found a good correlation between patients age and satisfaction specially at 3rd month post operatively.Robertsson *et al.* [29] found no correlation between satisfaction and age, just like what we found Noble et al [15] found patient satisfaction to decreases with advanced age. Regarding gender, most TKRs are performed in women [32], females seem to have increased risk of persistent pain after TKR. [33]. However, Lignard et al [32] showed that female gender had no influence on outcome after TKR. In our results, we demonstrated that gender is not affecting patient satisfaction. This observation is consistent also with findings of Fortin et al. [33]. Some studies correlate the presence of medical comorbidities with a poorer outcome. [32,34]. Few studies evaluated the effect of diabetes on outcome following TKR, Serna *et al* [35] suggested the necessity to examine the degree of glucose control in terms of its effect on final outcome. In diabetic patients, sensory and autonomic neuropathy can exist at subclinical levels [37], and the resulting loss of pain perception may contribute to change in pain scores in patients with DM. Papagelopoulos *et al* [37] reported lower function score with DM patients. Those authors recognized that diabetes Mellitus might influence clinical outcome just like what was found in this study. The greatest improvement is reported within the first six months after surgery. [12,13] We found increasing patient satisfaction from 3 to 6 months post operatively with P-value of <0.0001.

Strength and limitation:

The strength of our study include the use of reliable, valid and responsive instrument for assessing outcomes of TKR and data collected prospectively with good rate of follow up. The present study was not without limitation. It had a relatively small sample and that other potential variables were not collected for the study, Such as psychological problems and Body Mass Index.

Conclusions:

TKR is an effective treatment modality for end-stage OA of the knee regarding postoperative pain and function especially after six months of the operation, age and DM can affect outcome.

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