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Research Article

### PREVALENCE OF TOTAL KNEE REPLACEMENT AND ITS SATISFACTION AMONG PATIENTS IN MEDINA, SAUDI ARABIA, 2018

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**Abstract:**

**Background:** Recently, the rate of the Total Knee Replacement (TKR) has been steadily increasing due to its effectiveness in improving patients' functioning and quality of life, also in reducing the pain. Nevertheless, there are limited population-based data on the frequency and outcomes of total knee replacement.

**Objective:** The aim of this study was to investigate the epidemiologic characteristics and adverse events of patients submitted to TKR so as to conclude the most common indications and risk factors of the surgery.

**Method:** retrospective cohort study had been carried out in King Fahad Hospital in Madinah and Madinah National Hospital, on 65 patients (Male and Female) who already performed total knee replacement and had been interviewed using Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC).

**Results:** Majority of the patients were females as 53 (81.5%) while only 12 (18.5%) were males. Out of these numbers, nearly all patients (98.5%) had Osteoarthritis with 93.8% underwent TKR and 50.8% done on the bilateral knee, while one-third of them were distributed on both sides. Majority of them complained about swelling 37 (56.9%) as a post-operative complication. (WOMAC) score revealed a mean of 82.8 with a range from 40.5 to 99.2. More than half of them were satisfied with the surgical operation. This project also has indicated a positive relationship between post-operative complication such as stiffness and move limitation against satisfaction toward surgical operation.

**Conclusion:** Based on our findings even after post-operative complication, most patients were satisfied with the procedure. Therefore, after the operation, surgeons need to remind patients to do a regular visit for a post-operative check-up.

**Keywords:** Total knee replacement, WOMAC, Osteoarthritis, Surgery.

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## INTRODUCTION:

Knee replacement surgery is a safe intervention with a low mortality rate [1] indicated for treating chronic refractory joint pain when the conservative therapy has failed. In the last decades, the rate of the Total Knee Replacement (TKR) has been steadily increasing due to its effectiveness in improving patients' functioning and quality of life, also in reducing the pain [1,2,3]. Every year, over 600.000 knee replacements are carried out in the United States. Osteoarthritis (OA) considered as the primary indication for the procedure according to several studies and hypertension was the most common co-morbid condition among patients [1,4,1,2]. Diseases such as inflammatory arthritis fractures, malignancy can also lead to TKR. There is a high risk of developing venous thromboembolism among patients who undergo TKR; however, prophylaxis can reduce the risk when it is given appropriately [5]. A study [1] showed that the quality of life in patients who underwent TKR for OA was significantly improved with overall satisfaction was over 93%. Another study [1] found that a TKR does not restore normal knee function as well as before the onset of their arthritic symptoms but pain-free, although this procedure restores the patient's ability to do many routine activities. In our study, we were aiming to obtain the epidemiology of TKR in King Fahad Hospital, Saudi Arabia to get the most common indication and risk factors related to the surgery.

## METHODOLOGY:

Retrospective cohort study had been carried out in King Fahad Hospital in Madinah and Madinah National Hospital during the year 2018. A total of 65 participants ( male and female ) who already performed a Total Knee Replacment had been interviewd to complete the questionnire and WOMAC score has been used. The purpose of the study was explained, and a verbal informed consent was obtained from the participant.

## STATISTICAL ANALYSIS:

The data had been gathered through MS Excel and after data cleaning and data re-coding, it was then exported to Statistical Packages for Social Sciences (SPSS) version 21 for further tabulation and subsequently for statistical data analyses. Descriptive analysis for 65 patients had been presented as counts and proportions (%) for all categorical variables

while the mean  $\pm$  standard deviation had been applied for all continuous variables. Association of the degree of satisfaction and Post-operative complication had been measured using chi-square test. A level of  $p \leq 0.05$  had been used as cut off points for significant value.

## RESULTS:

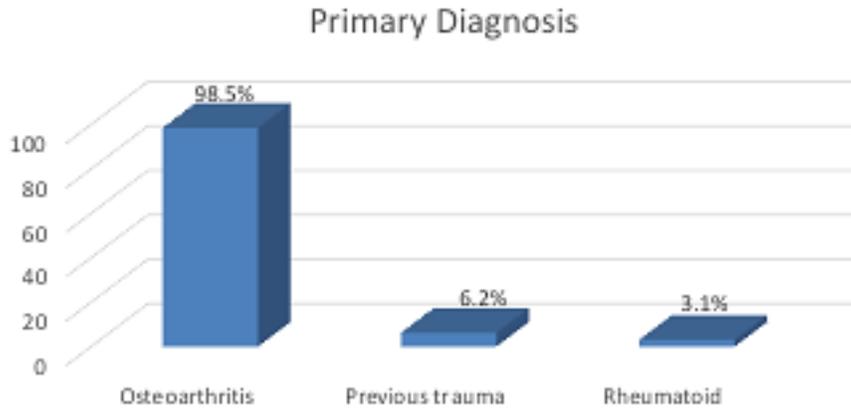
(Table 1) presents the description of qualitative variables where socio-demographic characteristics of 65 patients had been elaborated. The Majority of the patients were females as 53 (81.5%) while only 12 (18.5%) were males. Out of these numbers, 52 (80.0%) were Saudi and 13 (20.0%) were non-Saudi. With regards to educational level, 35.4% of them had a primary school, 26.2% were having intermediate school, 27.7% had a secondary school and only 10.8% were having university school. Nearly all patients were living inside Madinah (95.4%) with only 3 patients coming from outside Madinah. More patients were not employed (72.3%) compared to those who were employed (12.3%) and retired (15.4%). 60% of the patients were having hypertension, 41.5% were having Diabetes Mellitus, 9.2% were having Coronary Heart Disease and 24.6% were having other co-morbidities. In relation to vitamin D level, 70.8% of them had low level while 29.2 were having a normal level. Only 8 patients were smokers with 9 patients had a history of Trauma/RTA whereas 86.2% of them had long-term medication with 5 cases had a history of surgery at the site of operation. The primary diagnosis of patients shows, 64 (98.2%) had Osteoarthritis, 04 (06.2%) had previous trauma and 02 (03.1%) had Rheumatoid (Figure 1). Approximately all participants (93.8%) had total knee replacement with only 4 cases had a revision of knee. 50.8% of them had bilateral knee operation while both right and left knee operation registered 16 cases each respectively. Regarding post-operative complication, 56.9% of them had swelling, 24.6% had bluish or redness, 13.8% had stiffness, 21.5% had move limitation and 15.4% had other complication. 86.2% of them had a revision after surgery with 55.4% had revision less than a month after surgery, 30.8% had revision one month or more after surgery whereas the indication for revision shows, 87.7% had a follow-up visit and 12.3% had complications.

**Table 1: Description of qualitative variables**

Study Variables	N (%) (n=65)
Gender	
• Male	12 (18.5%)
• Female	53 (81.5%)
Nationality	
• Saudi	52 (80.0%)
• Non Saudi	13 (20.0%)
Educational Level	
• Primary school	23 (35.4%)
• Intermediate school	17 (26.2%)
• Secondary school	18 (27.7%)
• University	07 (10.8%)
City of residence	
• Inside Madinah	62 (95.4%)
• Outside Madinah	03 (04.6%)
Occupation	
• Unemployed	47 (72.3%)
• Employed	08 (12.3%)
• Retired	10 (15.4%)
Comorbidities	
• Diabetes Mellitus	27 (41.5%)
• Hypertension	39 (60.0%)
• Coronary Heart Disease	06 (09.2%)
• Others	16 (24.6%)
Vitamin D level	
• Low	46 (70.8%)
• Normal	19 (29.2%)
Smoker	
• Yes	08 (12.3%)
• No	57 (87.7%)

**Table 2: Description of qualitative variables (cont'd.)**

Study Variables	N (%) (n=65)
History of Trauma/RTA	
• Yes	09 (13.8%)
• No	56 (86.2%)
Long-term medication	
• Yes	55 (84.6%)
• No	10 (15.4%)
History of surgery at the site of operation	
• Yes	05 (07.7%)
• No	60 (92.3%)
Primary diagnosis	
• Osteoarthritis	64 (98.5%)
• Previous trauma	04 (06.2%)
• Rheumatoid	02 (03.1%)
Type of arthroplasty	
• Revision knee replacement	04 (06.2%)
• Total knee replacement	61 (93.8%)
Operated knee	
• Left	16 (24.6%)
• Right	16 (24.6%)
• Bilateral	33 (50.8%)
Post-operative complication	
• Swelling	37 (56.9%)
• Stiffness	09 (13.8%)
• Bluish	16 (24.6%)
• Move limitation	14 (21.5%)
• Other	10 (15.4%)
Revision after surgery	
• Yes	56 (86.2%)
• No	09 (13.8%)
When did have a revision?	
• Less than a month after surgery	39 (55.4%)
• One month or more after surgery	20 (30.8%)
• No revision	09 (13.8%)
What was the indication for revision?	
• Follow up visit	57 (87.7%)
• Complication	08 (12.3%)



**Figure 1: Distribution of primary diagnosis**

The description of quantitative variables had been described at **(Table 2)**. The mean age of patients was 61.4 years (SD 08.0), the mean height was 161.9 (SD 06.2), the mean weight was 80.4 kg (SD 13.2) and the mean BMI was 30.9 kg/m<sup>2</sup> (SD 05.9). The mean age of menopausal shows 48.9 years (SD 03.1) while the mean age at the time of operation was 59.9 years

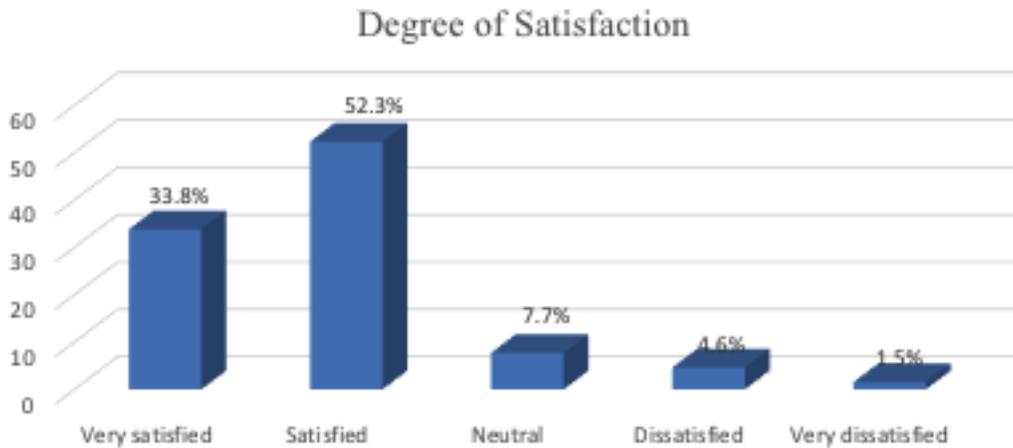
(SD 07.8). The mean duration of pain before surgery was 05.8 years (SD 04.9) and the mean severity of pain at the scale from 1 to 10 was 08.4 (SD 01.4). With regards to the mean of (WOMAC) score it shows, 82.8 (SD 14.5) with the median of 88 points and the minimum score was 40.5 while the maximum score was 99.2.

**Table 3: Description of quantitative variables**

Study Variables	Mean $\pm$ SD (n=65)
Age in years	61.4 $\pm$ 08.0
Height in cm	161.9 $\pm$ 06.2
Weight in kg	80.4 $\pm$ 13.2
BMI in kg/m <sup>2</sup>	30.9 $\pm$ 05.9
Age of menopausal (years)	48.9 $\pm$ 03.1
Age at the time of operation (years)	59.9 $\pm$ 07.8
Duration of pain before surgery (years)	05.8 $\pm$ 04.9
The severity of pain	08.4 $\pm$ 01.4
WOMAC score	82.8 $\pm$ 14.5
• Median (min-max)	08 (40.5 – 99.2)

**(Figure 2)** shows the distribution of the degree of satisfaction for surgery. Based on the results, 33.8% were very satisfied, 52.3% were satisfied, 7.7% were

neutral, 4.6% were dissatisfied and 1.5% were strongly dissatisfied.



**Figure 2: Distribution of degree of satisfaction for surgery.**

We used chi-square test at (Table 3) to measure the relationship between postoperative complication and degree of satisfaction with p-values which indicates whether the relationship is statistically significant and we used  $p \leq 0.05$  as a cutoff point for the level of significance. Majority of the patients were satisfied in the operation even after the post-operative swelling, however, we found a negative relationship to the degree of satisfaction ( $p=0.083$ ). Complaint of

stiffness showed only in a limited number of cases and it showed the positive relationship ( $p=0.025$ ). Bluish or redness complications were still significant in satisfied patients however the relationship between postoperative complication and the degree of satisfaction was negative ( $p=0.017$ ). Other complications also manifested yet were still negatively related to the degree of satisfaction ( $p=0.077$ ).

**Table 4: Relationship between Post-operative complication and degree of satisfaction (n=65)**

Complication	Strongly Dissatisfied N (%)	Dissatisfied N (%)	Neutral N (%)	Satisfied N (%)	Strongly Satisfied N (%)	P-value §
Swelling	01 (100%)	03 (100%)	04 (80.0%)	21 (61.8%)	08 (36.4%)	0.083
Stiffness	01 (100%)	01 (33.3%)	02 (40.0%)	03 (08.8%)	02 (09.1%)	<b>0.025 **</b>
Bluish/Redness	0	0	03 (60.0%)	09 (26.5%)	04 (18.2%)	0.264
Move Limitation	01 (100%)	01 (33.3%)	03 (60.0%)	08 (23.5%)	01 (04.5%)	<b>0.017 **</b>
Other	01 (100%)	01 (33.3%)	01 (20.0%)	06 (17.6%)	01 (04.5%)	0.077

§P-value has been calculated using Chi square test. \*\*Significant at  $p \leq 0.05$  level.

### DISCUSSION:

Total knee replacement has been widely regarded as the best surgical remedy on pain in the knee. According to the American Academy of Orthopaedic Surgeons, "Total knee replacements are one of the most successful procedures in all of the medicine [1]. In our study findings, 98.5% had Osteoarthritis with 93.8% underwent total knee replacement while only 4 patients who underwent revision of knee. Half of them were done on the bilateral knee with one-third of them for both left and right knee. Most of them

complained swelling after surgery with small proportion complained about stiffness, bluish or redness and move limitation. Points on WOMAC index showed a range of 40.5 to 99.2 with the mean score of 82.8. 86.1% of the patients were either strongly satisfied or satisfied with the surgical operation and post-operative complication such as stiffness and move limitation was having a positive relationship with the degree of satisfaction.

One of the researchers from Al Khobar, Saudi

Arabia, published an article about “The Quality of Life (QOL) after Total Knee Arthroplasties among Saudi Arabians [7]. He interviewed 52 patients. Based on his findings, 34.5% had undergone a bilateral knee operation, 16 patients were the right side and the rest have the left side. The overall percentage of satisfaction between the patients was 93.% These study findings, appeared to be relatively close to our study results where both of our studies results showed more than 30% undergone bilateral knees operation and overall satisfaction were both accounted more than 80% to more than 90% degree of satisfaction. Another article published in Jeddah, accounted for 41.6% of the patients were satisfied with their usual daily activity after surgical operation, 5.2% reported poor satisfaction and 59.7% reported great improvement [1]. The results in WOMAC score based on their study showed that mean value was 28 (SD 24.6) and the range was from 0 to 96 which were less convenient and showed lower success rate than the results of our study.

Although the latter study tackled the quality of life of patients after total knee arthroplasty, however, we both exemplified the satisfaction of patients after surgery and we both used WOMAC index to measure the health status of the patients which in our study outcome revealed far better in mean compared to their results. Another group of researcher from Riyadh, Saudi Arabia provided further examination of the complications following total knee replacement [1]. They reported that 39% undergone both right and left knee replacement with less on bilateral with 22%. They also elaborated that Urinary Tract Infections got the highest rate among other complications followed by surgical site infections. Hypertension was the commonest co-morbidity in their study next was diabetes. When talking about patients who underwent surgical procedures, both of our studies displayed different results where they registered higher in unilateral knee operation while our study reported higher in bilateral knee operation. Meanwhile, we equally exhibited similar findings of co-morbidities but showed different findings in the complication of patients after surgery.

In Nigeria, 45 patients had undertaken TKR among 45 patients only 7 of them had undergone a bilateral knee operation [1]. Osteoarthritis was the indication for the TKR in 34 knees (75.6%) while 11 TKR’s were done on knees with secondary arthritis following previous trauma or surgery. They further demonstrated that 31.6% of the patients were hypertensive with 1 patient with diabetes and 3 patients with both co-morbidities. In the United States, they reported that the rate of primary total

knee replacement was about ten times higher than the rate of revision total knee replacement and the commonest diagnosis was Osteoarthritis [1]. However, in Brazil, researchers reported 166 hospitalizations for knee replacement with 84.9% being registered with Osteoarthritis and 62.1% of the patients were hypertensive and some patients with either diabetic or having congestive heart failure [1]. These three international articles provided further evidence that TKR has been widely acknowledged as the best solution for ailing knee and it has been further validated in our study findings. Although each of our projects has its own description of findings nevertheless the clear scenario was that TKR brings new hope to those patients who endure a lot of pain due to Osteoarthritis and other secondary arthritis diseases.

### CONCLUSION:

Despite different methods available for the treatment of Osteoarthritis, TKR is deemed to be the most effective remedy to alleviate pain. Although it is costly, this surgical procedure improves the quality of life of the patient. Furthermore, based on our finding even after post-operative complication, most patients were still satisfied with the procedure. Therefore, after the operation, surgeons need to remind patients to do a regular visit for post-operative check-up.

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