The Egyptian Journal of Hospital Medicine (January 2018) Vol. 70 (9), Page 1448-1454

Quality of Life of Patients after Total Knee Arthroplasty at King Abdulaziz University Hospital, Jeddah, Saudi Arabia

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ABSTRACT:
Background: osteoarthritis is a degenerative disease affecting both genders and is more prevalent in females. The incidence of osteoarthritis in Saudi Arabia is up to 60%. Management is initially conservative with medications and lifestyle changes. Total knee arthroplasty (TKA) is the surgical option for patients who complain of severe pain and functional disabilities. TKA is correlated with improving quality of life, but despite this evidence, some patients complain of residual symptoms postoperatively which don't meet their pre-operative expectations.
Aim of the work: this study aimed to determine health related quality of life of patients after total knee arthroplasty and to assess the psychological factors affecting the patients after the procedure
Methodology: this retrospective cross-sectional study analyzed all the files of patients who underwent unilateral or bilateral TKA in KAUH from 2010-2017. A total of 78 patients were interviewed by phone using the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and short form quality of life (SF-36) questionnaires.
Result: a total of 78 patients (60 Females and 18 males) were participated in this study. The mean age was 65.7 years old. In general, 41.6% of the patients were satisfied with their usual daily activity, where on the other hand 5.2% of patients reported poor satisfaction and were much worse than before. 59.7% of the patients reported great improvement in comparison with the previous year and 22.1% of the patients reported a somewhat better improvement. 53.2% reported no limitation in their social life regarding physical activity and emotional problems, while 9.1% had physical and emotional problems interfering with their life.
Conclusion: TKA is a very successful and cost effective therapeutic option for treating knee osteoarthritis. Improvement in the quality of life and physical activity of patients supports other conducted previous studies.
Keywords: total knee arthroplasty; Saudi Arabians; quality of life; orthopedic surgery

INTRODUCTION

Osteoarthritis is a degenerative joint disease affecting both gender, but is more common in females. It's incidence increases about 10% with aging [1-3]. The incidence of osteoarthritis in Saudi Arabia is high and it reached 60% [2] . Management of osteoarthritis usually begins with conservative options such as physiotherapy, medications such as NSAIDs, and lifestyle changes. Conservative management usually delays surgery for a few years, but the pain of OA causes more functional disabilities which affects the quality of life (QOL) of those patients [2,3,4]. For this reason, Total Knee Arthroplasty (TKA) is recommended to facilitate patient's quality of life as a therapeutic option in severe cases [3]. Unilateral or bilateral TKA is a common orthopedic procedure that's performed in Saudi Arabia [4]. TKA is considered as one of the cost-effective procedures for improving patient's quality of life [5]. The main outcomes of total knee arthroplasty are relieving patient's symptoms and pain, restoring physical activity and improving sleep quality [6]. Unfortunately, some patients who were undergone TKA have residual symptoms such as mild stiffness, leg numbness and exercise-related pain [2], which do not meet their pre-operative expectations. Most patients expect to return to a completely normal life, as if their joint hadn't been affected. This misperception led to high postoperative expectations is multifaceted including factors involving the surgeon [6,7]. Quality of life according to the WHO is defined as "the individual perception of complete physical, mental and social well-being" [8]. QOL consists of positive, negative and bidirectional aspects [9]. Even with the postoperative advantages, QOL continues to be a concern in deciding the effectiveness of TKA [2].

In general, total knee arthroplasty correlates with improving QOL of patients; their sleeping cycle has greatly improved, along with ease of daily physical activity and elimination of permanent joint pain [3]. The correlation between TKA and QOL was examined in many studies, their findings and results among patients must be considered. There were few studies assessted

Received: 20/12/2017
Accepted: 30/12/2017
DOI: 10.12816/0044667

QOL correlated with the outcomes of TKA in Saudi Arabia. One cross-sectional study was done in Al-Khobar and 2 pilot studies were done in Jeddah [2,4].

This study aimed to assess the quality of life of patients who have undergone unilateral or bilateral total knee arthroplasty at King Abdulaziz University in Jeddah, Saudi Arabia.

METHODS

This retrospective cross-sectional study was conducted from 2010 to 2017 on 77 patients (59 female, 18 males) aged between 50 to 85 years old (mean age of 65) who underwent unilateral or bilateral total knee arthroplasty at King Abdulaziz University Hospital, Jeddah, Saudi Arabia. The Institutional Ethics Committee of King Abdulaziz University Hospital, Jeddah, Saudi Arabia, approved this study. Participating in this study was voluntary and conducted over the phone. The questions were thoroughly explained in the local language. It was clearly explained to participants that they should truthfully answer the questions without bias and that in no way will this survey affect any further treatment and follow up.

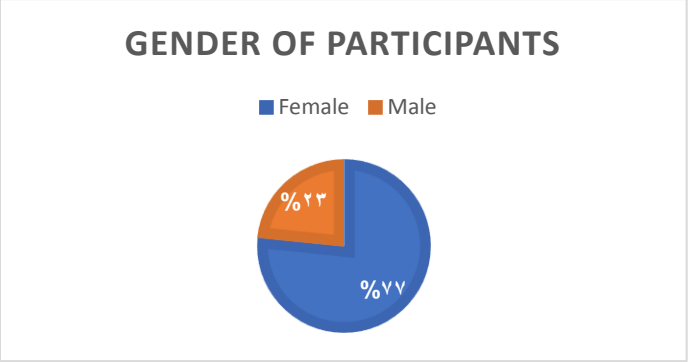
Two validated measurement tools were used. The Western Ontario and McMaster's Universities (WOMAC) Osteoarthritis Index and the Medical Outcomes Study Questionnaire ShortfForm 36 Health Survey (SF-36) was considered. The WOMAC is a well-known, disease-specific instrument for measuring clinical outcome in patients treated for knee osteoarthritis. Using a Likert scale, patients rate themselves on multiple items grouped in three domains: pain, stiffness and difficulty in function. The maximum score was 20 points for pain, 8 for stiffness and 68 points for clinical function. Higher scores indicated greater difficulty [7]. The SF-36 has eight scaled scores; the scores were weighted sums of the questions in each section, scores range from 0 – 100. Lower scores indicated more disabilities and higher scores indicated fewer disabilities. The data were analyzed using SPSS (Statistical Package for the Social Sciences), version 13.0. Data were expressed as the mean ± standard deviation (SD). Statistical significance differences between groups were determined by student's t-test and p values of <0.05 using a 95% confidence Interval (CI) was considered significant. **The study was done after approval of ethical board of King Abdulaziz university**.

RESULTS

77 patientswere participated in this study aiming to assessment of quality of life of patients after total knee arthroplasty. 59 of them were females (76.6%) as shown in **table 1** and **graph 1.**

Table 1: gender distribution of participants

Gender	Frequency	Percent
Female	59	76.6
Male	18	23.4
Total	77	100.0

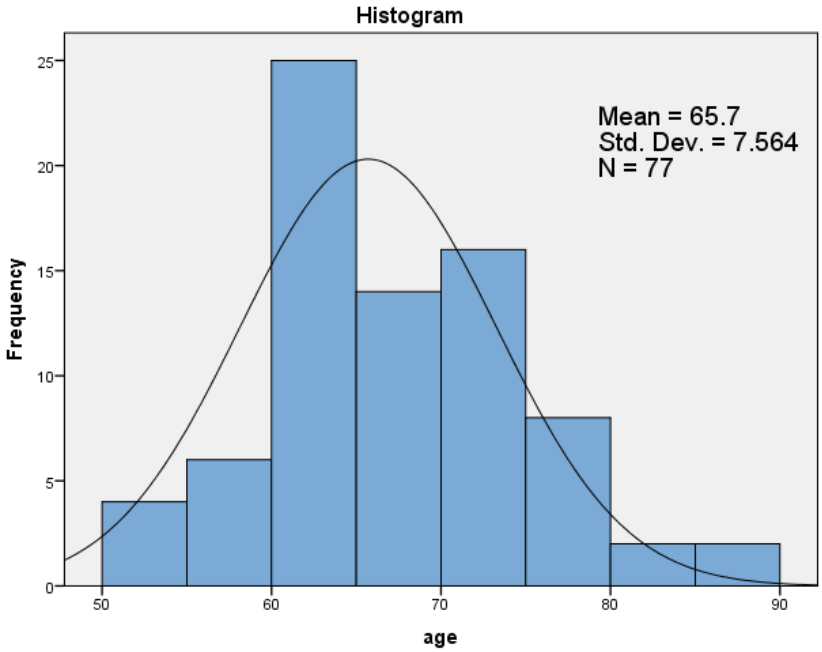


Graph 1: gender distribution of participants

The age of participants ranged from 50 to 85 years old. The mean age was 65.7 years and the standard deviation was 7.6 years as shown in **table 2 and graph 2.**

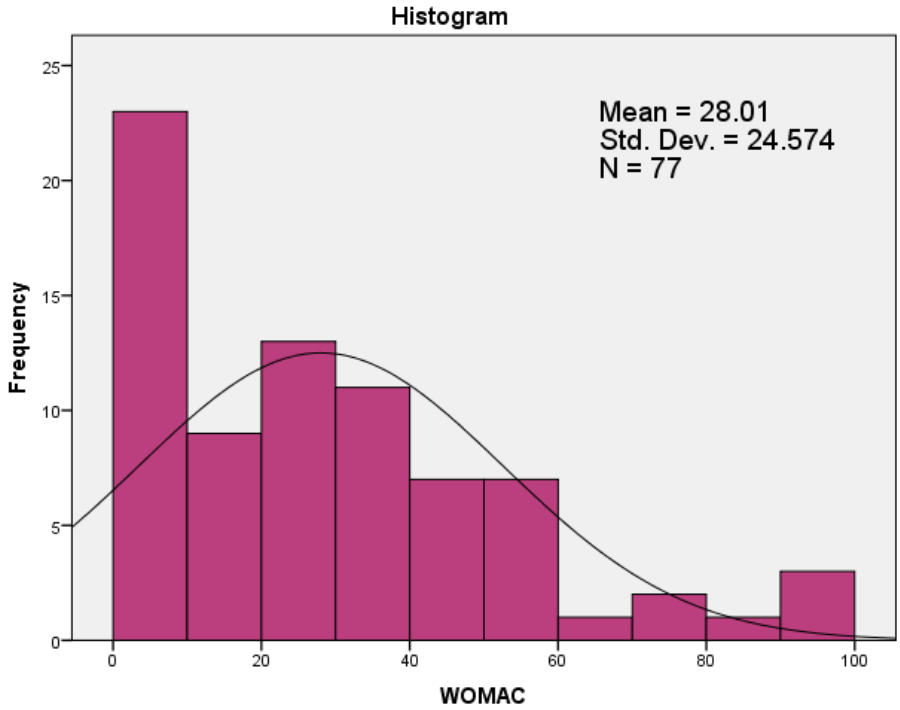
Table 2: age statistics of participants

	N	Minimum	Maximum	Mean	Std. Deviation
Age	77	50	85	65.7	7.6



Graph 2: age distribution of participants

The mean WOMAC score was 28 (SD±24.6), the distribution was shown in **graph 3.** The WOMAC score ranged from 0 to 96 and was divided into 3 categories as shown in **table 3.** The pain category ranged from 0 to 20, where the mean score was 6.2(SD±5.5). The stiffness category ranged from 0 to 8, where the mean score was 2 (SD±2.4). The physical activity category was ranged from 0 to 68, where the mean score was 19.8 (SD±18). Higher scores on the WOMAC indicated worse pain, stiffness and functional limitations.

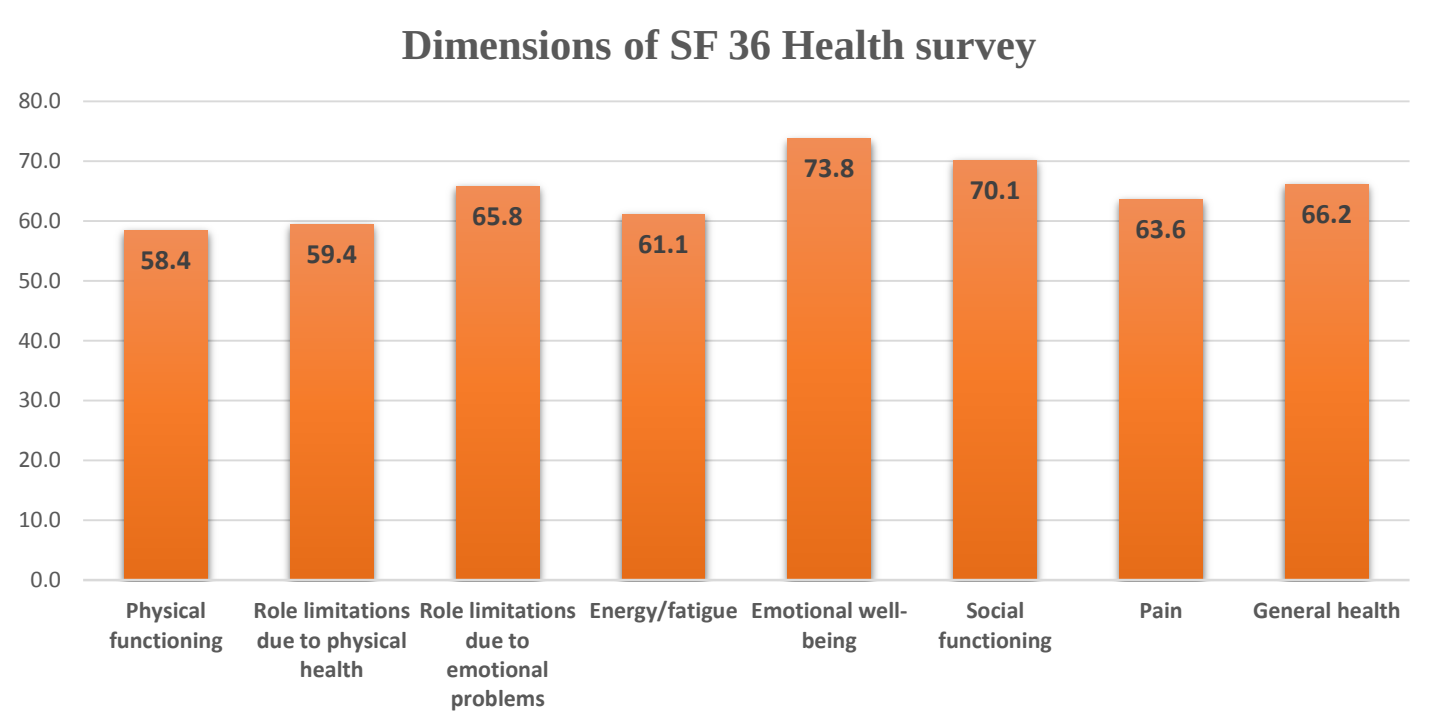


Graph 3: distribution of the WOMAC score

Table 3: results of the WOMAC score in the three categories

WOMAC	Minimum	Maximum	Mean	Std. Deviation
Total WOMAC Score	0	96	28.0	24.6
Pain	0	20	6.2	5.5
Stiffness	0	8	2.0	2.4
Physical Activity	0	68	19.8	18.0

The results of the 36-Item Short Form Survey (SF-36) was calculated based on the instructions of the RAND health system as shown in **table 4 and graph 4.**



Graph 4: mean score of each of the dimensions of the "SF-36 Health Survey"

The detailed average score of each item and each dimension was shown in **table 4**. The mean score of physical functioning was 58.4 and it was 59.4 for role limitations due to physical health. The mean score of role limitations due to emotional problems was 65.8 and for energy/fatigue was 61.1 . The mean score of emotional wellbeing was 73.8 and for energy/fatigue it was 70.1.The mean score of pain was 63.6 and for general health it was 66.2 . The dimension with the highest mean score was emotional wellbeing (73.8) and the least dimension was physical functioning (58.4).

Table 4: results of the SF-36 health survey (Items and dimensions)

Results of the SF-36 Health survey		
Items and Dimensions	Mean	Std. Deviation
Q3	40.9	41.1
Q4	66.9	41.0
Q5	53.9	43.5
Q6	49.4	42.5
Q7	64.9	40.6
Q8	40.9	40.3
Q9	49.4	41.7
Q10	64.3	38.8
Q11	75.3	38.6
Q12	78.6	35.8
Physical functioning	58.4	26.3
Q13	59.7	49.4
Q14	59.7	49.4
Q15	59.7	49.4
Q16	58.4	49.6
Role limitations due to physical health	59.4	46.1
Q17	67.5	47.1
Q18	64.9	48.0
Q19	64.9	48.0
Role limitations due to emotional problems	65.8	45.2
Q23	56.6	32.8
Q27	58.7	34.7
Q29	67.3	31.9
Q31	61.8	34.1
Energy/fatigue	61.1	24.7
Q24	74.0	30.4
Q25	79.7	28.0
Q26	69.1	32.7
Q28	78.2	30.5
Q30	67.8	35.1
Emotional well-being	73.8	24.4
Q20	75.6	32.2
Q32	64.6	37.9
Social functioning	70.1	31.6
Q21	59.7	33.5
Q22	67.5	36.5
Pain	63.6	32.4
Q1	70.5	30.8
Q33	62.0	33.1
Q34	50.0	36.0
Q35	72.1	29.0
Q36	76.3	32.2
General health	66.2	17.8

DISCUSSION

Knee osteoarthritis is a progressive degenerative disease, which has multiple factors affecting its severity including genetic influence, obesity, and lifestyle. Some external factors such as social support, mental status and comorbidities have an influence on the outcome of TKA [2].

This study was designed to assess health-related quality of life (HRQOL) of patients after TKA, in the orthopedics clinic at King Abdulaziz University Hospital, Jeddah, Saudi Arabia and involved 77 patients. An interview used two validated questionnaires by phone was used; the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the Medical Outcomes Study Questionnaire Short Form 36 Health Survey (SF-36) was considered.

Reliability of the Arabic version of the RAND-36 Health Survey and its equivalence to the US-English version was supported by a study on a convenience sample of bilingual (English and Arabic) Saudi citizens (n=415) at Saudi ARAMCO Company, Dhahran, Saudi Arabia by Coons [9]. The overall satisfaction and improvement of QOL was studied in Saudi Arabia by **Al-Omran** [4] between June and September 2013, AlKhobar, Saudi Arabia. The overall satisfaction and improvement of QOL in male patients was 93.77%, and 92.77% in female patients. All patients indicated that they would recommend others to undergo the same procedure to improve their QOL. **Bachmeier *et al.*** [11] used WOMAC and MOS SF-36 questionnaires to detect significant and clinically meaningful changes in outcome after hip and knee replacements. The mean age for the knee replacement group was 72 . WOMAC scores (means and standard deviations) 12 months postoperatively in the patient group undergoing knee joint replacement surgery were, 21.8 for physical function, 5.1 for pain and 2.7 for the stiffness score. Those WOMAC scores were almost similar to the scores obtained in our study. The "SF-36" scores were 70.2 for general health, 57.8 for bodily pain, 49.7 for physical function, 49.5 for the physical role function, 77.6for the social function, 77.7 for mental health, 64.7 for the emotional role function, and 58.8 for vitality, which wasn't too different from the scores in our study.

A research was done by **Oliveira *et al.*** [12] to study the quality of life (QL) and social characteristics of patients submitted to total knee arthroplasty (TKA) using the Brazilian validated version of the SF-36 Quality of Life Questionnaire. They stated that TKA can bring a significant improvement to quality of life. The postoperative mean scores of the different dimensions of the SF 36 score were 59.06 for functional capability, 54.96 for limitation due to physical factors, 63 for pain, 77.31 for the general state of health, 77.33 for vitality, 81.25 for social factors, 70.83 for limitations due to emotional factors, and 85 for mental health.

Pivec *et al.* [13] used the Short-Form 36 (SF-36) Survey to evaluat the longitudinal variations in SF-36 physical and mental scores after TKA. Pre-operatively, the mean physical component score was 33.0 points (95% CI 32.1–33.9 points), which peaked at one year (47.8 points; 95% CI 46.9–48.7 points). The mental component was 52.9 points; 95% CI 51.6–54.2 points pre-operatively and reached a maximum at a one-year follow-up (55.9 points; 95% CI 55.0–56.7 points).

Šantić *et al.* [14] reported that primary total knee arthroplasty patients expressed significant improvement in all the parameters excluding mental health assessment. They also found that total hip or knee arthroplasty significantly enhanced health-related quality of life in elderly patients. The same result also detected by **Ethgen*et al.*** [15] in a qualitative and systematic review of literature regarding health-related quality of life in total hip and total knee arthroplasty. Their studies described substantial improvements in the scores of physical health, such as those for pain and physical functioning. Comparatively greater and faster improvements were noted with respect to the pain score. The greatest improvement seemed to take place within the first three to six months after surgery. Studies with longer-term follow-up described long-lasting improvement. Improvement in mental and social health was less obvious.One-year postoperative assessment of patients who underwent SB-TKA revealed a mean (SD) WOMAC score of 63.85 (±10.97) of 20 patients (9 men and 11 women), all of whom underwent SB-TKA for bilateral end-stage primary OA in a study by **Mohammad *et al***. [2].

Fernandez-Cuadros *et al.* [1] carried out a quasi-experimental intervention study before and after design in a sample of 125 patients with knee osteoarthritis who were assessed before and after the operation. They all were operated by the same orthopedic surgeon and with the same type of total knee arthroplasty between the year 2008 and 2012. They concluded that TKA significantly improves HRQOL in

all its dimensions and components, except for physical functioning and physical-role, although they also improved over time after the operation. **Alentorn-Geli *et al.*** [16] performed a study to assess the QOL in patients who had undergone TKA by comparing two groups of ages. The first group included patients less than 80 years old and the second group was for patients who were 80 years and older. The sample size was 439 patients, and the data was collected using the SF-36 questionnaire demonstrated preoperatively and one year postoperatively.

In conclusion: the present results revealed that patients 80 years and older had a similar outcome in regards to improve quality of life in comparison with the first group.

CONCLUSION

We can concluded that TKA improved health-related quality of life (HRQOL) of patients, and the WOMAC and SF 36 scores that we obtained in this study were very similar to those reached by other studies. Further deeper studies are required to compare health-related quality of life both before and after total knee arthroplasty.

ACKNOWLEDGMENT

We thank people who helped us in data collection: Adel Ali Alfozan, Ahmad Mohammed Rambo, Anas Mohammed Nabil Abbas, Rawan Ahmed Haimed and Khadijah Tareq Alshatri.

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