

Quality of Life among Patients with Knee Replacement

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Abstract

Background: Knee replacement results in improved pain symptoms and quality of life, therefore, is one of the most commonly performed orthopedic procedures. **The aim** of this study was to assess the quality of life among patients with knee replacement. **Research design:** descriptive research design was utilized in this study. **Setting:** This study was conducted in Orthopedic Outpatient Clinic at Benha University Hospital in Benha City. **The sample:** Convenient sample of patients attended to previously mentioned setting; the total sample included ١٠٠ patients. **Two tools were used I):** A structured interviewing questionnaire which consists of three parts to assess **a):** Demographic characteristics of patients with knee replacement. **b):** Medical history of patients with knee replacement **٢):** Knowledge of patients with knee replacement and **٣):** Reported practices of patients with KR, **II):** Quality of life scale to assess the effect KR operation on quality of life among the patients. **Results:** ٥٢ % of patients with KR aged from ٥٠ years old or more, ٦٤% of them were female, and ٥٨% of them were married. Regarding the medical history ٦٤% of the patients had total knee replacement, ٢٦% of the patients had good knowledge about KR, ٥٨% of patients with KR had satisfactory total reported practices scores, and ٧٢% of patients with knee replacement had good total quality of life score. **Conclusion:** More than one quarter of the patients with KR had good knowledge about KR operation, while more than half of them had satisfactory practices regarding KR and less than three quarters of patients with KR had a good total quality of life scores. There were statistically positive correlations between total knowledge, total practices score and total quality of life of the patients with knee replacement. **Recommendations:** Health educational program should be developed and implemented for patients with KR to improve, and update them with the most current information about the operation and practices regarding KR operation to enhance their quality of life.

Key words: Knee replacement and Quality of life

Introduction:

Knee Replacement (KR) is a surgical procedure undertaken to replace the weight-bearing surfaces of the knee joint. KR can be performed as a partial, also called unicompartmental, which replaces only the damaged surfaces of the knee or a total KR which involves replacement of all three compartments of the knee, known as the medial compartment (inside aspect of the knee), the lateral compartment (outside of the knee), and the patellofemoral compartment (the joint between the patella and the femur) (*Lei et al., 2019*).

Knee replacement has become a successful procedure for treating end stage OsteoArthritis (OA), with approximately 94- 97% of knee replacements performed for primary or post-traumatic osteoarthritis because of its effectiveness in relieving pain, correcting deformities, and restoring function. KR is performed in patients who have degenerative changes with pain and limitation of function in the knee that has failed with conservative and non-operative measures. Other underlying diagnoses that may be treatable with a knee replacement include Rheumatoid Arthritis (RA), peri-articular fractures, or malignancy of the knee. The continued success of KR is due to improvement in surgical technique, bearing surfaces and implant design (*Khalil et al., 2020*).

The role of KR in improving Quality of Life (QOL) is examined, with a view to assess "physical, mental and social wellbeing" of patients undergoing KR procedure. Pain and functional ability, perceptions of physical and mental health, and quality of life in a global sense, are increasingly used to assess the impact of knee replacement surgery. Improvements in

pain and function following KR have been well established (*Siviero et al., 2020*).

Patients typically achieve more than 60% and 80% of potential improvement after KR, respectively. However, a substantial variation in outcomes, with 16% and 8% of patients reporting either the same or worse patient-reported outcomes after KR, respectively. In addition, after surgery there remains an enduring risk of revision, where implant components are removed, added, or exchanged (*Burn et al., 2020*).

Community Health Nurse (CHN) has an important role and clear responsibilities when dealing with patients with KR to prevent complication and enhance health status. CHN also plays a significant role in disseminating important health information by offering education and counseling about instructions after KR. CHN provides information about importance of physical therapy, regular follow up, taking medication regularly, exercises after KR to be used in combination with healthcare professionals and nutritional regimen. CHN provides ongoing support and encouragement for patients with KR to speed up the recovery process (*Greengard& Dermott, 2020*).

Aim of the study:

To assess the quality of life among patients with knee replacement.

Subject and Method

Research design:

A descriptive research design was utilized to conduct this study..

Setting:

This study was conducted at Orthopedic Outpatient Clinic at Benha University Hospital in Benha City because this place receives large attendance of patients with knee replacement.

Sample:

Convenient sample used in this study and involved 100 patients with knee replacement from the previously mentioned setting from the beginning of June 2020 to the end of September 2020. with the following criteria: Free from any handicap and accepted to participate on the study.

Tools for data collection:

Two tools were used to collect the data

Tool I: A structured interviewing questionnaire: It was developed by the investigator based on reviewing related literature. It was written in simple clear Arabic language and composed of three parts to assess the following (Appendix I):

First part a: It was concerned with demographic characteristics of patients with knee replacement involved in the study. It included 8 questions age, sex, marital status, level of education, occupation, residence, monthly income and type of family.

B: It was concerned with the medical history of patients with knee replacement, this part included 3 questions; duration of knee replacement operation, type of knee replacement operation, causes of performing knee replacement operation.

Second part: It was concerned with the knowledge of patients with knee

replacement which included 8 questions; meaning of knee replacement, causes that leads to knee replacement operation, risk factors, types of operation of knee replacement, importance of knee replacement operation, measures for diagnosis the need of knee replacement operation, instructions after operation of knee replacement and complication of knee replacement and source of information.

Scoring system of the studied patients knowledge was adapted as following:

The scoring system of knowledge for patients with KR was calculated as follows two score for completely correct answer, while one score for incomplete correct answer, and don't know was scored zero. For each area of knowledge the score of items was summed– up and the total divided by the number of items giving the mean score for the part. These score were converted into a percent score.

The total knowledge score was considered good if the score of the total knowledge $\geq 70\%$ (12) point, while considered average if it equals $50-70\%$ (8-12) point and considered poor if it is $\leq 50\%$ (4) point.

Third part: It was concerned with reported practices of patients with KR which included four sections that divided into 1) **Nutrition** which included (9) items; Eating three basic meals of the day in a regular fixed time, eating and drinking products of milk because it has calcium, avoiding foods that contain fats and cholesterol, eating fresh vegetables that contains vitamin d, using oils in cooking, eating meals of fish that contain omega 3, eating nuts that enhance immunity, avoiding drinking sugars and cola drinks, avoiding

smoking and stay away from passive smoking.

٢) Exercise which included (٣) items: Practicing daily sporting exercises for operation at regular basis, practicing relaxation exercises and sitting in an open and quiet place and practicing deep breathing

٣) Compliance of medication and follow-up which included (٤) items; Taking medication at regular time, consulting doctor in case of side effects of medications, following-up on a regular basis and doing the instruction prescribed by the doctor during follow-up.

٤) Precautions after operation of knee replacement which included (٧) items; Avoiding completely standing to avoid pain, depending on healthy knee for going upstairs until the new joint gets used to, standing up during bathing and avoid knee bending, moving feet and ankles so that blood flow to the leg muscles increases and the risk of blood clots or swelling decreases, avoiding bending the hip joint more than ٩٠ degrees, avoiding bending over to pick things up from the ground to avoid knee bending and avoiding wrapping the leg and take care when turning around.

Scoring system of the reported practice:

The scoring system is graded according to the items of questionnaire. The scoring system for patients with KR reported practice

was calculated as follows two score for always, while one score for sometimes and zero for never practicing. For each area of reported practice the score of items was summed– up and the total divided by the number of items giving the mean score for

the part. These score were converted into a percent score

The total reported practices scores was considered satisfactory if the score of the total reported practice $> ٦٠\%$ equal and more (١٤) point, while considered unsatisfactory if it is $\leq ٦٠\%$ equal and less (١٤) point.

Tool (II): Quality of life scale of patient with KR which a Short-Form ٣٦ score adapted from (Batarfi et al., ٢٠١٨). The scale was measured on a Likert type scale of (always, sometimes and never) which included three domains physical, psychological and social domain of patient with KR.

١- Physical domain which included (١١) items: Health status hinders self caring such as personal hygiene and wearing clothes, avoiding activities that require exertion, finding difficulty to go up stairs, finding difficulty during walking for mile or more, finding difficulty in bending knees over and stand up, health affects on the tasks related to daily activities such as shopping, carrying groceries or supermarkets, finding difficulty in

doing activities and personal needs, finding changes in the sleep rate, health status preventing home care, changing nutritional habits after KR operation and health affects on the work, such as the inability to complete tasks and reducing work hours and need additional time to perform tasks.

٢- Psychological domain which included (١٠) items: Feeling unable to adapt with disease, feeling unsatisfied with the life and current health condition, feeling the loss of hope, feeling nervous and worried about

the future, feeling dissatisfied with general appearance after having KR operation, feeling loss of psychological support from family, avoiding the painful and distressing situations, feeling become a load on family after getting disease, worrying about the cost of treatment and staying stress with less reason.

٣- Social domain which included (٧) items: Such as knee replacement operation affects on the social relationships, knee replacement operation affects on the exercise and hobbies with others, illness cause isolation from others, avoiding talking about health status with the friends and neighbors, feeling difficulty in enjoying life with others,

avoiding participation with family and social events and finding it difficult to communicate or dealing with others after the occurrence of the disease.

Scoring system of quality of Life adapted as following:

The scoring system is graded according to the items of questionnaire. The scoring system of quality of Life for patients with knee replacement scale score was calculated as zero scores for always, one scores for sometimes and two scores for never. For each area of quality of life the score of items was summed– up and the total divided by the number of items giving the mean score for the part. These score were converted into a percent score. The total quality of life score was considered good if the score $\geq 70\%$ (٤٢) points while considered average if its ٥٠- ٧٥% equal (١٤- ٤٢) points equals and considered poor if it $\leq ٥٠\%$ (١٤) points.

Pilot study

The pilot study was carried out on ١٠% (١٠)

patients of the sample size, to test the tool clarity, time needed to fill each sheet and applicability of the study tool. Completing the sheet consumed about ٣٠ minutes. No modifications were done, so the pilot study sample was included in the total sample.

Content validity:

The tools validity was done by three of Faculty's Staff Nursing experts from the Community Health Nursing Specialties who reviewed the tool for clarity, relevance, comprehensiveness, and applicability and easiness for administration, implementation and according to their opinion minor modifications were required.

Reliability:

The reliability of tools was applied by the investigator for testing the internal consistency of the tools reliability was measured by using structured interviewing questionnaire. The reliability proved to be high based on the values of cronbach alpha co-efficients. The reliability for knowledge of patients with knee replacement was ٠.٥٩, the reliability for reported practice of patients with KR was ٠.٧٥ and the reliability for quality of life of patients with KR was ٠.٩٠.

Field work:

This study was conducted at Orthopedic Outpatient Clinic at Benha University Hospital in Benha City. The process of data collection was during ٤ months started at the beginning of June ٢٠٢٠ to the end of September ٢٠٢٠. The process of data collection was two days per week (Saturday and Thursday) from ٩ am to ١ pm to collect data from patients with knee replacement. The average time needed for the sheet was around ٣٠/minutes for each patient, the average number interviewed at the

outpatient clinics were 3-5 KR patients/day depending on their responses of the interviewers.

Statistical analysis:

All data collected were organized, tabulated and analyzed by using the Statistical Package for Social Science (SPSS version 20), which was used frequencies and percentages for qualitative descriptive data and was used for quantitative data, spearman correlation test (r) was used for correlation analysis and degree of significance was identified.

Associations between items were considered as the following:

(p value)

P. value > 0.05 Not significant

P. value < 0.05 Statistically Significant

P. value < 0.001 Highly statistically significant

Results:

Table (1) Shows that; 52.1 % of patients with KR their age were 50 years or more with mean was 50.98 ± 16.00 , 74.1% of them were females and 58% of them were married. Regarding the level of education, 54.1 % of patients had university education or more, 38% of them were employee, while 72% of them lived in rural areas, and 56% of them had enough income/ month and 44% of them lived in nuclear family.

Table (2): Shows that; 98% of patients with KR had complete of correct answer regarding importance of KR operation,

while 10% of them didn't know the types of KR operation.

Figure (1): Illustrates that; 38% of the patients with knee replacement had average total knowledge score regarding KR operation, and only 26% of them had good total knowledge score regarding KR operation.

Figure (2): Reveals that; 74% of patients with KR had satisfactory total reported practices scores regarding precautions, while 56% of them had unsatisfactory total reported practices scores regarding nutritional practices.

Figure (3): Reveals that; 58% of patients with KR had satisfactory total reported practices scores after KR. And 42% of them had unsatisfactory total reported practices scores.

Figure (4): Reveals that; 92% of patients with knee replacement had good total quality of life score and only 8.0% of the patients had poor quality of life.

Table (5): Reveals that; there were statistically positive correlations between total knowledge, total practices score and total quality of life of the patients with knee replacement. There were statistically positive correlations between total quality of life of the patients with knee replacement and their total knowledge score.

Table (١): Distribution of the studied patients with knee replacement regarding their demographic characteristics (n=١٠٠).

Demographic characteristics	No.	%
Age/year		
<٣٠	١٢	١٢.٠
٣٠-٤٠	١٢	١٢.٠
٤٠-٥٠	٢٤	٢٤.٠
٥٠ -	٥٢	٥٢.٠
Mean ٥٠.٩٨±١٦.٥٥		
Sex		
Male	٣٦	٣٦.٠
Female	٦٤	٦٤.٠
Marital status		
Single	١٠	١٠.٠
Married	٥٨	٥٨.٠
Widowed	٢٤	٢٤.٠
Divorced	٨	٨.٠
Level of education		
Can't read and write	١٠	١٠.٠
Read and write	١٠	١٠.٠
Basic education	١٤	١٤.٠
Secondary education	١٢	١٢.٠
University education or more	٥٤	٥٤.٠
Occupation		
Employee	٣٨	٣٨.٠
Free business	١٢	١٢.٠
Retired	١٤	١٤.٠
House wife	٣٢	٣٢.٠
Not working	٤	٤.٠
Residence		
Urban	٣٨	٣٨.٠
Rural	٦٢	٦٢.٠
Monthly income		
Enough and saving	١٦	١٦.٠
Enough	٥٦	٥٦.٠
Not enough	٢٨	٢٨.٠
Type of family		
Individual	٢	٢.٠
Nuclear	٧٤	٧٤.٠
Extended	٢٤	٢٤.٠

Table (٧): Distribution of the studied patients' knowledge regarding knee replacement (n=١٠٠).

Knowledge	Complete correct Answer		Incomplete of correct answer		Don`t know	
	No.	%	No.	%	No.	%
Meaning of KR.	٢٦	٢٦.٠	٣٨	٣٨.٠	٣٦	٣٦.٠
Causes that leads to KR operation.	٢٨	٢٨.٠	٣٤	٣٤.٠	٣٨	٣٨.٠
Risk factors that leads to KR operation.	٣٢	٣٢.٠	٤٠	٤٠.٠	٢٨	٢٨.٠
Types of KR operation.	٢٢	٢٢.٠	١٨	١٨.٠	٦٠	٦٠.٠
Importance of KR operation.	٧٨	٧٨.٠	٨	٨.٠	١٤	١٤.٠
Measures for diagnosis the need of KR operation.	٢٨	٢٨.٠	٤٠	٤٠.٠	٣٢	٣٢.٠
Instructions after operation of KR.	٤٦	٤٦.٠	٣٢	٣٢.٠	٢٢	٢٢.٠
Complications of KR.	٣٨	٣٨.٠	٤٦	٤٦.٠	١٦	١٦.٠

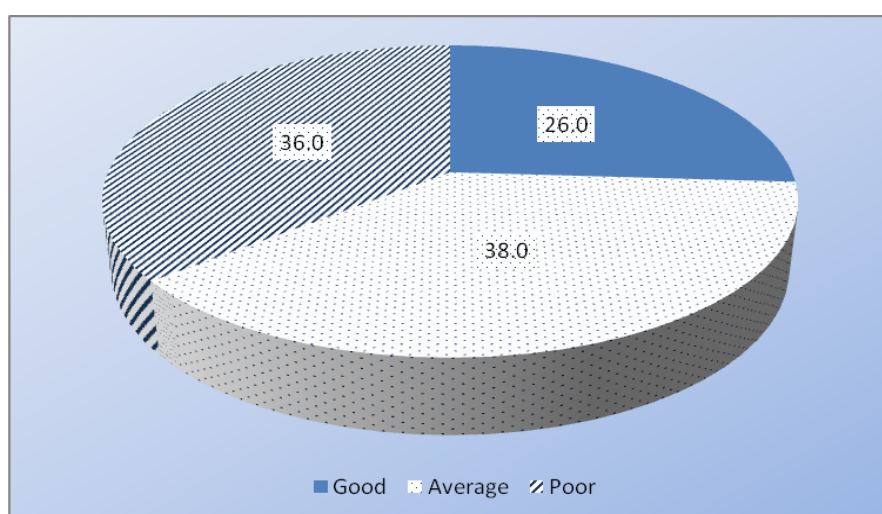


Figure (١): Percentage distribution of studied patient with knee replacement regarding their total knowledge score about knee replacement (n=١٠٠).

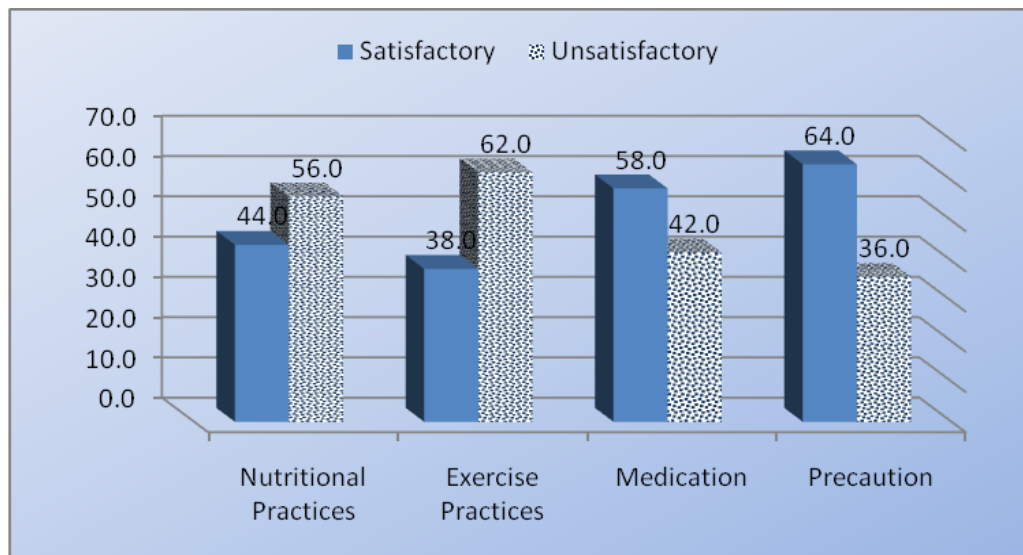


Figure (٧): Percentage distribution of the studied patients with knee replacement regarding their total reported practices items scores related to knee replacement (n=١٠٠).

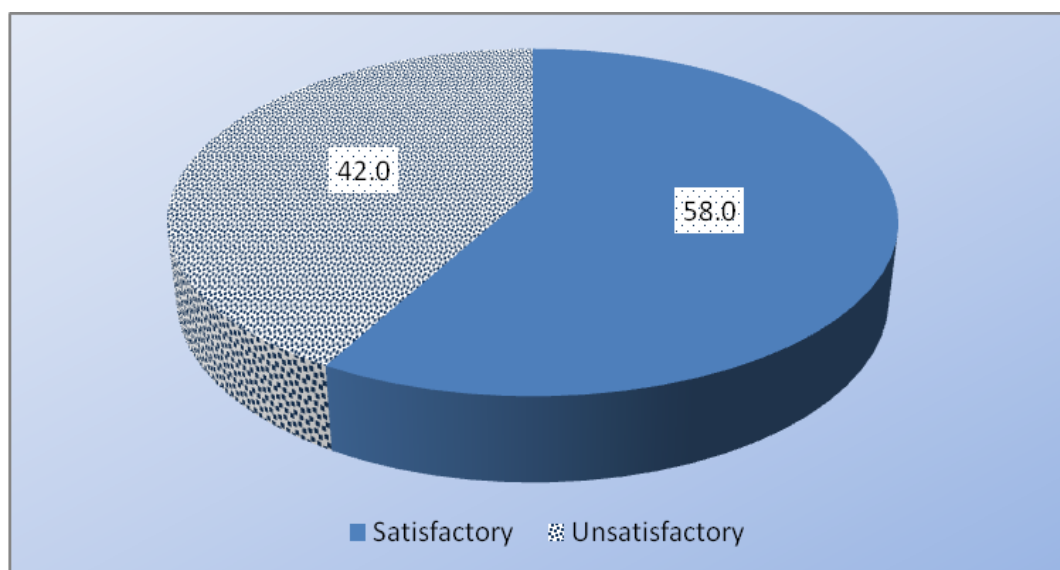


Figure (٨): Percentage distribution of studied patients with knee replacement regarding their total reported practices scores regarding KR (n=١٠٠).

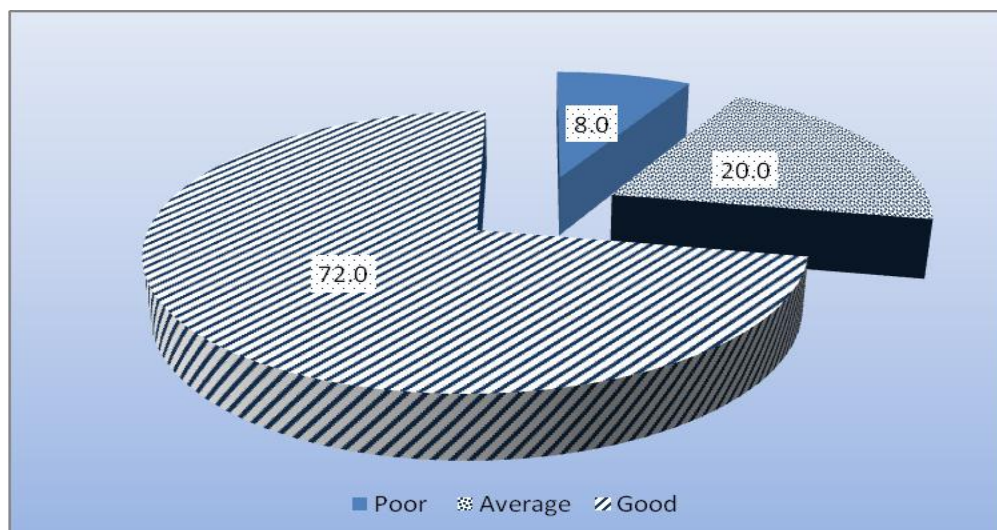


Figure (٤): Percentage distribution of studied patients with knee replacement regarding their total quality of life domains scores (n=١٠٠).

Table (٣): Correlation between studied patients with KR total knowledge scores, total reported practices scores and total quality of life scores (n=١٠٠).

		Total knowledge	Total practices	Total quality Of life
Total knowledge	r	١	٠.٢٦٦	٠.٣٩٢
	p-value		٠.٠٧*	٠.٠٠٠**
	N	١٠٠	١٠٠	١٠٠
Total practices	r	٠.٢٦٦	١	٠.١٥٢
	p-value	٠.٠٧*		٠.١٣٠
	N	١٠٠	١٠٠	١٠٠
Total quality of life	r	٠.٣٩٢	٠.١٥٢	١
	p-value	٠.٠٠٠**	٠.١٣٠	
	N	١٠٠	١٠٠	١٠٠

Discussion:

Knee Replacement is usually considered as the final route for treatment of severe disease of the knee. KR has been widely used in recent years, mainly due to the increased functional requirements, the consequent aging of population, the development and application of new materials and more sophisticated surgical techniques. After the failure of conservative medical therapy, knee replacement has become a significant choice in the management of patients with advanced arthritis of the knee. Because of the constant increase in the number of KR in worldwide annually, it has been one of the most effective orthopedic procedures resulting in a substantial and sustained improvement in quality of life for patients with severe knee problems (Guo et al., 2018).

According to demographic characteristic of the patients with KR, the finding of the present study showed that, about more than half of the patients with KR their age were from 50 years old or more with mean was 50.98 ± 16.00 and more than three fifths of the patients with KR were female (table 1). This might be due to the aging effect on the knee especially the hyaline cartilage that gives an extremely smooth surface for the knee function which more common in women than men. This finding agreed with Michel et al. (2019), who conducted study on the "Knee replacement incidence and social deprivation, in France," (N=99), who reported that over 87% of patients with KR their age were 60 years old, and 62% of them were women.

In relation to marital status, the result of the present study showed that about more than half of the patients with KR were married (table 1). This finding was in same line with

Lashgarizad et al. (2018), who conducted study on the "Investigating knowledge of patients undergoing total knee replacement, in Iran", (N=140), who reported that (89, 3%) of the patients with KR were married. Also this finding agreed with Ihekweazu et al. (2018), who conducted study on the "Socio-demographic factors impact time to discharge following total knee arthroplasty, in America", (N= 806), who reported that 86% of the patients with KR were married.

The present study revealed that approximately more than half of the patients with KR had university education or more (table 1). This finding supported by Stark (2016), who mentioned that two thirds of the patients with KR had university education. However this finding disagreed with Lashgarizad et al. (2018), who reported that 43% of the patients with KR had secondary education.

The present study revealed that slightly more than one third of the patients with KR were employee (table 1). This finding agreed with Ihekweazu et al. (2018), who reported that 43.1% of the patients with KR were employed.

The results of this study revealed that more than three fifths of patients with KR lived in rural areas (table 1). This might be due to lack of health services in rural areas. This finding disagreed with Lashgarizad et al. (2018), who reported that the patients with KR were mostly from urban areas 92.9%, only 9.1% were from rural areas. Also this finding disagreed with Schilling et al. (2018), who studied the "Predictors of inpatient rehabilitation after total knee replacement, in Australia", (N=30 389), who reported that more than half of studied sample from urban area.

The present study revealed that slightly less than three quarter of the patients with KR lived in nuclear family (table 1). This finding agreed with **Billon et al.** (2014), who conducted study on the "Prospective assessment of patients' Knowledge and informational needs and of surgeon-to-patient information transfer before and after knee or hip arthroplasty, in Bethesda", (N=63), who reported that 86% of the patients with KR were living with a partner.

The present study revealed that; more than one quarter of the patients with KR had completely correct answer regarding the causes that leads to KR operation (table 2). This result agreed with **Cronström et al.** (2020), who conducted study on the " On the waiting list for joint replacement for knee osteoarthritis: Are first-line treatment recommendations implemented, in Sweden", (N=229) who found that the 38% of the patients with KR know reasons of KR operation.

Regarding to the knowledge of the patients with KR about knee replacement, the present study revealed that; less than fifth of the patients with KR did not know the complications of KR operation (table 2). This finding disagreed with **Al-Rumaih et al.** (2014), who conducted study on the "Assessment of community knowledge toward joint replacement therapy, in Jeddah", (N=962) who reported that, the majority of the patients with KR didn't know the complications of KR operation.

Regarding the total knowledge score of patients with KR the present study revealed that, only more than one third of the patients with KR had good total knowledge scores regarding KR operation (figure 1). This might be due to decreased accessibility of health services in rural areas and they didn't see doctors unless there was problem. This result supported by **Mohrej et al.** (2018), who conducted study on the "Knowledge and attitude towards total knee

arthroplasty among the public, in Saudi Arabia", (N=1040) who found that the studied sample knowledge was adequate in only 29.1%.

Regarding the reported practices of precautions after operation of KR of the patients with KR, the present study revealed that more than two fifths of the patients with KR always avoided bending over to pick things up from the ground to avoid knee bending (figure 2). This finding agreed with **Loth et al.** (2018), who reported that only the minority of patients who take risk of bending over.

Regarding total reported practices items scores regarding knee replacement, the present study revealed that, more than three fifths of patients with KR had satisfactory total reported practices scores regarding precautions after KR (figure 3). This might be due to that patients follow instructions of medical team to gain the functions of the knee rapidly and to avoid complications.

Regarding the total practices score of the patients with KR, the present study showed that, more than half of patients with KR had satisfactory practices regarding KR (figure 3). This result might be due the patients with KR know the importance of doing healthy practices to increase comfort and decrease the risk of injuries. This finding agreed with **Owsley** (2016), who stated that, the majority of the patient's with KR had good healthy lifestyle practices.

Regarding total quality of life score of the patients with KR the present study revealed that; less than three quarters of patients with KR had good quality of life scores (figure 4). This finding agreed with **Lan et al.** (2020), who conducted study on the "How we are measuring cost-effectiveness in total joint arthroplasty studies, in USA", (N=140), who

reported that patients with KR had significantly good health-related quality of life than the general population. This finding also agreed with **Leem et al. (٢٠١٩)**, who reported that ٦٠.٧% of studied sample had a good quality of life.

Regarding correlation between patient's total knowledge and total reported practices score with KR operation and their total quality of life score this study revealed that; there were statistically positive correlations between total knowledge, total practices score and total quality of life of the patients with KR (table ٣). These findings might be due to knowledge play important role for a change of behavior leading to change of practices and affect on the quality of life. As when the patients have good and enough knowledge the patients will know everything about KR operation and perform good practice as taking medication, regularly follow up and following precautions to avoid complication after operation then patient will notice improvement in quality of life and will be satisfied.

Conclusions

Based on the result of the present study and research questions, the following can be concluded:

More than one quarter of the patients with KR had good knowledge about KR operation, while more than half of them had satisfactory practices regarding KR and less than three quarters of patients with KR had a good total quality of life scores. There were statistically positive correlations between total knowledge, total practices score and total quality of life of the patients with knee replacement.

Recommendations

In the light of the results of the present study, the following recommendations are suggested:

- ١- Health educational program should be developed and implemented for patients with KR to improve, and update them with the most current information about the operation and practices regarding KR operation to enhance their quality of life.
- ٢- Regular follow up for patient with KR to ensure effectiveness of operation, avoiding complication and revision of KR.
- ٣- Further studied need to be focusing on improving quality of life among patients with KR.

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