QUALITY OF LIFE FOR PATIENTS AFTER TOTAL KNEE REPLACEMENT SURGERY

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ABSTRACT

Background: Total Knee Replacement (TKR) remains the surgical gold standard treatment for patients suffering from end-stage osteoarthritis (OA) to restore the quality of life in patients with Knee osteoarthritis. **Aim:** This study aimed to assess quality of life for patients after total knee replacement surgery. **Subjects and Method: design:** A descriptive research design was utilized. **Setting:** study carried out at outpatient clinics in University Mansoura Hospital. **Subjects:** Purposive sample of total knee replacement patients (100). **Tools: Tool I:** A Structured interviewing, It includes two parts, **part 1:** Patient's demographic characteristics, **part 2:** patient history and joint level factors, **Tool II:** Short form survey 36 questions (SF-36) to assess quality of life. **Results:** This study showed that 62% of the studied patients had good quality of life. Also, the only factors associated with quality of life in patients post total knee replacement surgery was joint level factors. As well as clarified that 37% of studied patients had satisfactory in quality of life from one to six months after surgery, while 63% of them had unsatisfactory. Also, 83% of them had satisfactory in quality of life from 7 to12 months after surgery, while 17% of them had unsatisfactory in quality of life. **Conclusion:** About two thirds of the studied patients had good quality of life. The highest percentage of good quality of life was Physical functioning domain followed by Mental Health domain. Also, there was only significant relation between joint level factors and levels of quality of life among patients with total knee replacement. Moreover, The majority of them had satisfactory in quality of life from 7 to12 months after surgery Meanwhile there was only significant relation between floor number and levels of quality of life. **Recommendations:** the study recommended Performing Physiotherapy Exercises and Activities of Daily Self-Care.

Keywords: Quality of life, Total knee replacement.

INTRODUCTION

Total knee replacement (TKR), also known as total knee arthroplasty (TKA), is a surgical operation that involves the replacement of a damaged knee joint with an artificial one. (Jahic, Omerovic, Tanovic, Dzankovic& Campara,2018) Total knee arthroplasty (TKA) is a procedure that is used to treat persistent refractory knee pain and function loss caused by a variety of underlying knee problems. TKA is most commonly performed in individuals with knee osteoarthritis (OA), although it is also performed in patients with rheumatoid arthritis, fractures, and malignancies. (Al-Mohrej et al,2017).

Total knee replacement (TKR) is one of the most commonly performed elective surgical procedures in orthopaedics, with the ability to improve function, relieve pain, and restore quality of life in patients with knee osteoarthritis.. Surgical demand in the United States is expected to increase by 673 percent (3.48 million) between 2005 and 2030. (Fernandes, Poetab, Martins, Lima and Neto,2018). Total knee arthroplasty aims to reduce pain, increase functional mobility (such as walking and stair climbing), and encourage patients to return to physical activity. TKA is well known for reducing post-surgical discomfort. (O'Halloran, 2016).

The World Health Organization (WHO) defines Quality of Life as an individual's view of their place in life in relation to their goals, expectations, standards, and concerns in the context of the culture and value systems in which they live. It is a broad notion influenced by a person's physical health, psychological state, personal values, social interactions, and relationship to key characteristics of their surroundings in a complicated way. (WHO, 2017). Patients' subjective judgments of the effect of a clinical condition on their life, such as their capacity to accomplish physical and social tasks, to feel satisfied in their daily lives, and to live independently, are all represented by Quality of Life. (Perrotti et al, 2019).

Competency in nursing practice is essentially required for nurses who care for patients with Total Knee Arthroplasty. The nursing care should be started at the preoperational period, such as physical and mental preparation, providing advice on conducting pre and post-operation. Pain management, complication monitoring, rehabilitation by promoting exercise of leg muscles and knee are required after operation for patient safety without complications and well rehabilitation. (McDonall , et al.2019)

Significance of the study:

Total knee replacement (TKR) is the gold standard in the treatment of end-stage osteoarthritis of the knee and is one of the most commonly performed elective surgical procedures in orthopaedics, having the ability to enhance function, relieve pain, and restore mobility. (Fernandes, Poeta, de Quadros Martins, de Lima, and Neto, 2018).
The patient's records of Mansoura University Hospital reported that total patients admitted for total knee replacement were 97 patients from April to September 2019.

In the United States, around 750,000 knee replacement procedures are performed each year. In 2020, the number of people who will have total knee replacement surgery in the United States is estimated to climb to 1,375,574. (Causey-Upton and Howell, 2017). However, prevalence rates vary by region, with prevalence rates ranging from 3.8 to 70% depending on study methodology, such as clinical, radiographic, patient self-reporting, or physician diagnosis. Furthermore, because the incidence and prevalence of osteoarthritis (OA) rises with age, a longer life expectancy will result in a greater number of persons suffering from the disease. In the United Kingdom (UK), 20% to 30% of people over the age of 60 have symptomatic osteoarthritisIn Iraq, Yemen, Saudi Arabia, and Syria, more than one million people suffer from osteoarthritis (OA). Osteoarthritis affects around 85% of people over 75. 40% of people with the disease have substantial issues with daily activities, to the point that they interfere with work or social roles. (AlKuwaity, Mohammad, Hussain , Alkhanani and Alkhanani,2018).

AIM OF THE STUDY

The aim of this study was to assess quality of life for patients after total knee replacement surgery.

This will be achieved through the following research objective:

1- Detect quality of life domains (physical, social, mental) for patients post total knee replacement surgery.
2- Determine factors associated with quality of life in patients post total knee replacement surgery.

Research question:

1- What is level of quality of life in patients post total knee replacement surgery?
2- What are the factors associated with quality of life in patients post total knee replacement surgery?

SUBJECTS AND METHOD

Technical design:

The technical design included the study research design, setting, subjects and tool of data collection.

Research design:

The design that was utilized in this study is a descriptive research design.

Setting:

The study was conducted at orthopedic outpatient clinics in University Mansoura Hospital.

Subjects:

Purposive sample of patients with total knee replacement patients follow up orthopedic Outpatient clinics at Mansoura Hospital University in a period of six months from May, 2020 and completed by end of October 2020 . The total number of patients was 100 patients.

Inclusion Criteria:

Patients who completed 3 months or more after total knee replacement surgery.

Exclusion criteria:

- Patients with communication disorder.
- Complicated cases e.g. Vascular injury- Neural deficit-Stiffness- Malalignment and Patients with communication disorder.

Tools of data collection:

Data for this study was collected using the following tools:

Tool (I): A Structured interviewing which included two parts:

Part (1): Socio-demographic characteristics of the patients contain ten questions (two open questions, four closed questions, four multi choice questions).

It includes age, sex, level of education, marital status, occupation, residence, family member number, lifting condition and family income.

Part (2): patient history and joint factors contain seven questions (one open question, one closed question, five multi choice questions).

It including duration of disease, body mass index (weight/ hight^2) weir, and jan, (2021) , diet and family history of arthritis and joint factors including Acute Joint Injury - Joint Deformity and Muscle Weakness. All this tool developed by the researcher after reviewing and utilizing the most recent and relevant literature (Albilasi.etal., 2018)

Tool II: Short form survey 36 questions (SF-36) to assess quality of life:-

This tool developed by (Ware and Sherbourne, 1992) to assess quality of life. The SF-36 short survey is a generic instrument to measure generic health concepts with 36 items spanning eight domains of QOL. It covers physical functioning domain, which includes 10 items relevant to daily activities such as running, walking, bathing and dressing, climbing stairs, bending and kneeling, and so on, as well as role limitation owing to physical difficulties., which include 4 items, General mental health, which include 5 items like coping abilities, enjoying life, feeling hope, despair, happiness, dissatisfaction, and satisfaction with life, among other topics, Role restriction as a result of an emotional condition, which involves 3 items, Social functioning, which includes 2 items related to relationship with family and friends, participation in social events and feeling of isolation, etc., General health domain, which includes 6 items related to the patient's personal perception of his or her health, bodily Pain domain, which includes 2 items related to the severity of the patient's body pain, and Energy or Vitality domain, which includes 4 items related to the patient's energy or vitality, exhausted and tired. This tool was originally written in English, and then translated into Arabic before being re-translated into English.

Scoring system for QOL domains: The SF-36 survey consists of eight scaled scores, which are the weighted sums of the questions in their section. The scoring is done in two steps. Step 1: Precoded numeric values are recoded using the scoring key provided; note that all items are scored so that a high score defines a more favorable health status. Furthermore, each item was scored on a scale of 0-100, with 0-100 being the lowest and greatest possible values. Step 2: To create the 8 scale scores, items from the similar scales are averaged together. These scores were transformed into a percent score based on a cut point of 60% for each domain of QOL. **(Silva, Santana, Silva, and Novaes, 2019)**. The patient was regarded to have a good quality of life if the percent score was equal to or

greater than 60 percent, and if it was less, the patient was considered to have a poor quality of life.

II. Operational Design:

The study has gone through several stages, including different phases which were preparatory phase, Validity and reliability, pilot study and field work.

A- Preparatory phase:

The researcher used books, journals, periodicals, magazines, and internet explorer like as PubMed, Ebesco, El- Sevier to evaluate pertinent current, previous, local, and foreign literature addressing various elements of the topic.

B- Validity:

All of the research tools were determined by nine academic experts in the fields of nursing and medicine. Their thoughts on the study tools' clarity, comprehensiveness, applicability, and practicality were solicited.

C- Reliability:

The Cronbach alpha coefficient was used to evaluate the proposed method's internal consistency, which was then utilized to determine its reliability. Cronbach's alpha value for Arabic type in the self-care behavior evaluation questionnaire tool was 0.829.

D- Pilot Study:

It was carried out to test the validity and applicability of the tool, as well as to estimate how long it would take to complete out the study instruments. The quality of life measure was used on ten % of total knee replacement patients. The results of the pilot study, as well as expert revisions of the tools, were taken into account. The study did not include patients who took part in the pilot project.

E- Field Work:

This study's data was gathered during a six-month period, beginning in May 2020 and concluding in October 2020. The researcher spent two days a week in the aforementioned hospital's orthopaedic outpatient clinics. The interview, which lasted about 20 to 25 minutes, was then started by the researcher. Approximately 1 to 3 patients were interviewed at a time using the data gathering methods. After filling out each tool, the researcher checked each item on each sheet in front of the patient to ensure that no points were overlooked.

III-Administrative design:

The dean of Port Said University's nursing faculty wrote an official letter to the director of Mansoura Hospital University, requesting authorization to collect data at Mansoura Hospital University's orthopedic clinics**.**

IV-Ethical Consideration:

Before data collection, the scientific research ethics committee in the college of nursing obtained ethical approval. Following a clarification of the study's goal and process, the university director of Mansoura Hospital offered his approval to conduct the study. The protocol for this study was approved by the ethics and science research committee. Patients gave their agreement to participate in the study after the study was explained to them and they were guaranteed that the data collected would be kept confidential and used only for the study's purposes. The researcher informed the study participants that they had the right to withdraw from the study at any moment without explanation.

V- Statistical design:

Data entry was done with the Epi-Info 6.04 computer software package, and statistical analysis was done with the statistical Package for Social Science (SPSS) version 25.0. Descriptive statistics in the form of frequencies and percentages were employed for qualitative variables, while means and standard deviations were used for quantitative data. To compare qualitative variables, the chi-square test was performed. When the p. value is less than 0.05, the significant level is considered. (Anova, T-test, and bi variate analysis) were used to determine the correlation between dependent and independent variables.

RESULTS

Figure (1): Clarifies that, 62% of the studied patients had good quality of life for patients with total knee replacement**,** while 38% of them had poor total quality of life.

Table (1): illustrates that, the highest domain of quality of life domains of the patients with total knee replacement was Physical functioning with mean of (22.52±5.580), while the lowest domain of them was social functioning with mean of (5.30±2.488).

Table (2): represents that, the highest percentage of good quality of life was Physical functioning followed by Mental Health (75% and 64%) respectively, while highest percentage of poor quality of life was Role limitation due to physical health 75%.

Chart (1): shows that 37% of studied patients had satisfactory in quality of life from one to six months after surgery, while 63% of them had unsatisfactory. Also, 83% of them had satisfactory in quality of life from 7 to12 months after surgery, while 17% of them had unsatisfactory in quality of life.

Table (3): clarifies that, there was only significant relation between floor number and levels of quality of life.

Table (4): demonstrates that, there was only significant relation between joint factors and level of quality of life.

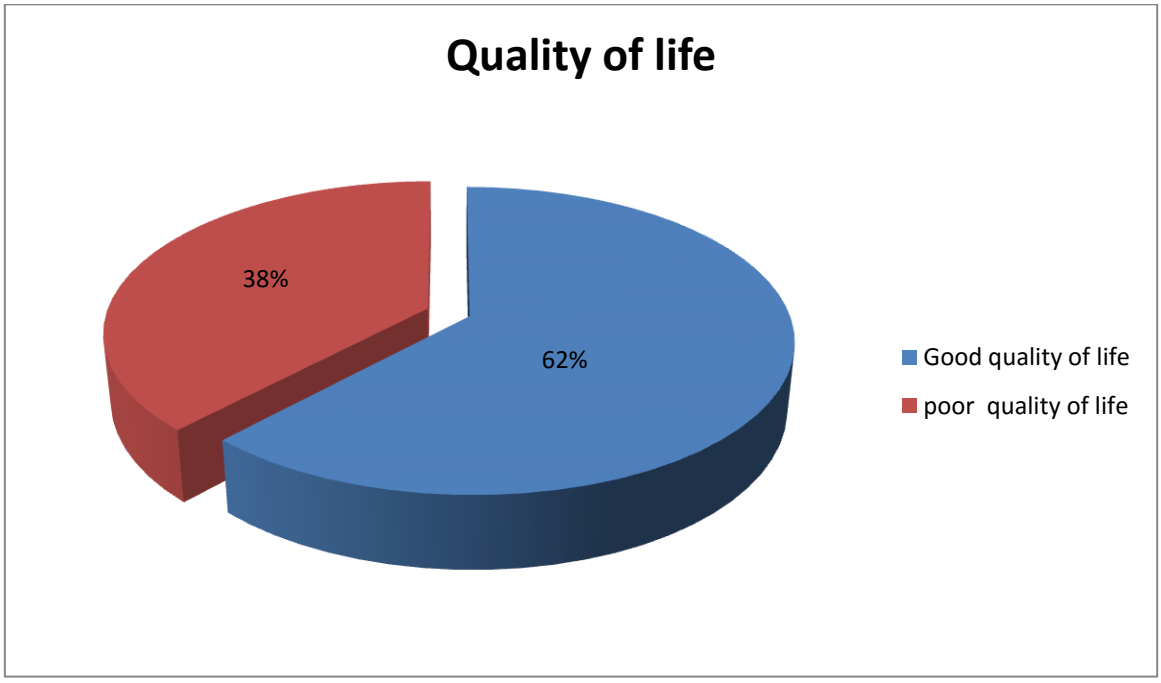

Figure (1): Levels of quality of life among patients with total knee replacement (n=100)

Table (1): Mean of Quality of life domains of the patients with total knee replacement (n=100)

Quality of life domains	Mean ± SD
Physical functioning (PF)	22.52±5.580
Role limitation due to physical health (RP)	4.79±.1.149
Badly pain (BB)	6.72±2.995
General health perception (GH)	18.47±4.272
Vitality (VH)	14.41±3.470
Mental health (MH)	20.13±5.210
Social functioning (SF)	5.30±2.488
Role limitation due to emotional problems (RE)	4.73±.1.392
Total quality of life	97.07±21.880

Table (2): Levels of quality of life domains for patients with total knee replacement (n=100)

Quality of life domains	Poor quality N (%) (< 60%)	Good quality N (%) (≥ 60%)
Physical functioning (PF)	25 (25.0)	75 (75.0)
Role limitation due to physical health (RP)	75 (75.0)	25 (25.0)
Bodily pain (BP)	63 (63.0)	37 (37.0)
General health (GH)	49 (49.0)	51 (51.0)
Energy/Vitality (VH)	45 (45.0)	55 (55.0)
Social functioning (SF)	69 (69.0)	31 (31.0)
Mental Health (MH)	36 (36.0)	64 (64.0)
Role limitation due to emotional problems (RE)	43 (43.0)	57 (57.0)
Total quality of life	38 (38.0)	62 (62.0)

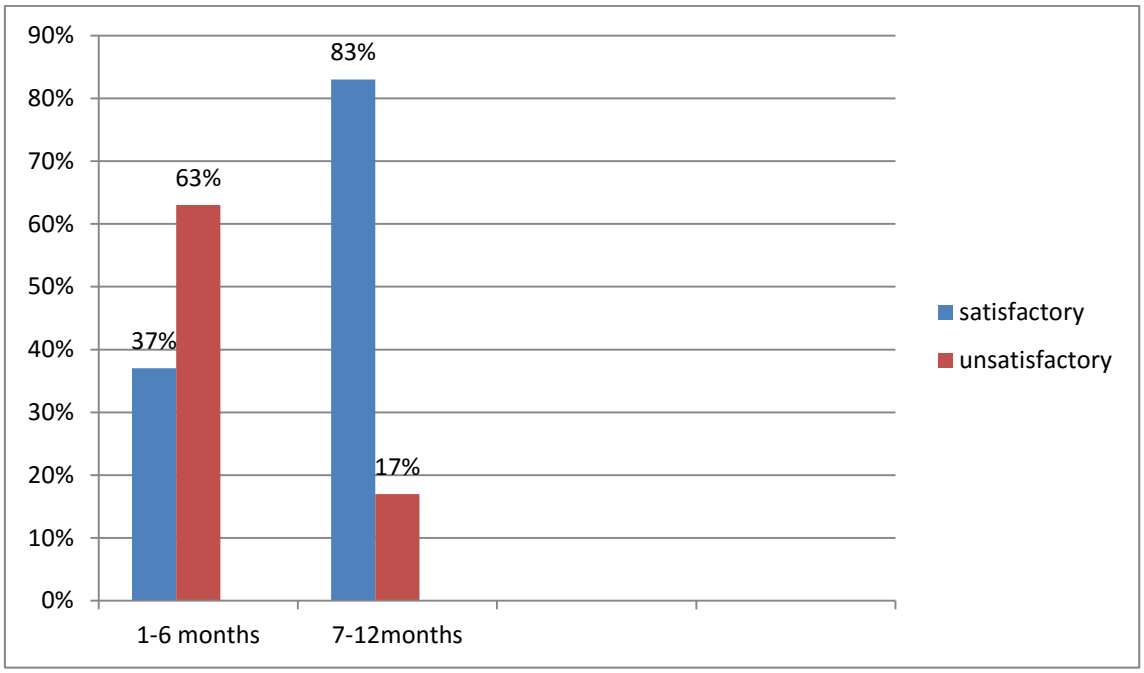

Chart (1): Satisfactory and unsatisfactory Levels of health related quality of life for patients with total knee replacement (n=100).

Table (3): Relation between levels of quality of life and socio-demographic characteristics of patients with total knee replacement (n=100).

socio-demographic characteristics	Poor quality 38 (%)	Good quality 62 (%)	Test	P- value
Age/years				
50 – 59	32 (32.0)	44 (44.0)	x^2 #	
60 < 69	5 (5.0)	17 (17.0)	1.254	.302
≥ 70	1 (1.0)	1 (1.0)		
Educational level				
Illiterate	7 (7.0)	19 (19.0)		
Read and write	13 (13.0)	18 (18.0)	x^2 #	.576
		19 (19.0)		
Secondary	10 (10.0)	6(6.0)	.852	
University	8 (8.0)			
Work			x^2#	
working	26 (26.0)	32 (32.0)	53.270	.686
Not working	12 (12.0)	30 (30.0)		
Gender			x^2#	
Male	13 (13.0)	28 (28.0)	64.241	.298
Female	25 (25.0)	34 (34.0)		
Marital status				
Single	2 (2.0)	2 (2.0)		
Married	24 (24.0)	45 (45.0)	x^2#	387.
Divorced	1 (1.0)	3 (3.0)	1.073	
Widowed	11 (11.0)	12 (12.0)		
Family income			x^2#	
Enough	12 (12.0)	21 (21.0)	64.194	.300
Not enough	26 (26.0)	41 (41.0)		
Number of family members			X^2#	
2-4	24 (24.0)	31 (31.0)	57.912	.516
5-8	14 (14.0)	31 (31.0)		
BMI				
Normal Weight (18.5- 24.9)	1 (1.0)	7 (7.0)	X^2#	.204
Overweight (25- 29.9)	8 (8.0)	18 (18.0)	1.304	
Obesity ≥ 30	29 (29.0)	37 (37.0)		
Floor number				
First	27 (27.0)	43 (43.0)	x^2#	.036*
Second	8 (8.0)	18 (18.0)	1.602	
Third	29 (29.0)	1 (1.0)		
Presence of elevator			X^2#	
Yes	3 (3.0)	1 (1.0)	69.618	.162
No	35 (35.0)	61 (61.0)		

* Significant level considered when P-value ≤ 0.05 x^2# → Chi square test

Table (4): Factors associated with levels of quality of life among patients with total knee replacement (n=100).

patients' history	Poor quality N (%)	Good quality N (%)	Test	P- value
Family history of arthritis (n-47)	21 (21.0)	26 (26.0)	X^2# 56.577	.565
Degree of relatively First degree Second degree Third degree	 9 (9%) 9 (9%) 3 (3.0)	 19 (19.0) 6 (6.0) 1 (1.0)	X^2# .754	.638
Joint factors Acute joint injury joint injury Muscle weakness Joint roughness	 5 (5.0) 1 (1.0) 5 (5.0) 27 (27.0)	 13 (13.0) 7 (7.0) 7 (7.0) 35 (35.0)	X^2# 2.170	.004*
Chronic disease (DM) Yes No	 19 (19.0) 19 (19.0)	 21 (21.0) 41 (41.0)	X^2# 59.097	.472
Rheumatoid arthritis Yes No	 20 (20.0) 18 (18.0)	 22 (22.0) 40 (40.0)	X^2# 61.070	.401
Chronic gout Yes No	 14 (14.0) 24 (24.0)	 11 (11.0) 51 (51.0)	X^2# 59.911	.442
Taking corticosteroid Yes No	 16 (16.0) 22 (22.0)	 15 (15.0) 47 (47.0)	X^2# 55.898	.591

*Significant level considered when P-value ≤ 0.05 x2# → Chi square test

DISCUSSION:

Total Knee Replacement (TKR) is a common surgical procedure performed for treatment of advanced knee osteoarthritis, rheumatoid arthritis, meniscus tears, joint infections as well as prolonged knee pain. (Price, et al., 2018). Total knee replacement could affect patient self- care activities that individuals perform to maintain health, life,

and well-being. (Konopka, et al., 2018). On the other hand quality of life (QOL) is abroad multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life. (Alexiou, et al., 2018).

The current study results concerning quality of life levels for patients with total knee replacement, showed that three quarters of the studied patients had good quality for physical functioning; More than half of them had good quality of life at role limitation due to emotional problems and had good quality of life at total quality of life .This finding come in the same line with the study Gobbi, et al., (2021) about Clinical outcomes in elderly patients with knee osteoarthritis in Italy which said that more than half of patients had good quality of life at total quality of life. Conversely, this result was inconsistent with the study Cho, et al., (2017) about Quality of life following total knee arthroplasty in U.S.A which found that one third of patients had good quality of life at psychological status. From the researcher point of view, this result may be because patients with total knee replacement could adapt to their life after surgery and practice their life normally.

Moreover, the current study results revealed that more than three fifths of the studied patients had good quality of life for patients with total knee replacement, while more than one third of them had poor quality of life. This current study result was in congruence with the study Saad, et al., (2018) about Health related quality of life in patients with knee replacement in England which said that more than half of participants had good total quality of life for patients with total knee replacement. Conversely, this result was in disagreement with the study Beswick, et al., (2018) about Chronic pain after total knee replacement in Bristol, UK which found that one third of participants had good total quality of life for patients with total knee replacement .this result may be due to high self-care management of patients with total knee replacement.

On the other hand the current study results concerning satisfactory and unsatisfactory of health related quality of life for patients with total knee replacement, demonstrated that more than one third of studied patient had satisfactory in quality of life from one to six months after surgery, while more than three fifths of studied patients had unsatisfactory. Also, the majority of them had satisfactory in quality of life from 7 to12 months after surgery This result was in accordance with the study Bierke and Petersen., (2017) about The first year after uncomplicated total knee replacement in Australia which

found that majority of patients had satisfactory in quality of life within the first year after total knee replacement. Also, this result was in agreement with the study Barton, et al., (2019) about Satisfaction with knee replacement in Canada which reported that three quarters of patients had satisfactory in quality of life within the first year after total knee replacement. From the researcher point of view, this result may be due to patients with total knee replacement were compliant the instructions and guidelines about their disease .Also this may be because the poor function of the knee joint was smoothened by TKR in the early stages after the operation.

As regard to relation between levels of quality of life and socio-demographic characteristics of patients with total knee replacement, the current study clarified that there was only significant relation between floor number and levels of quality of life. This result was in accordance with the study Burn, et al., (2018) about Cost-effectiveness of unicompartmental compared with total knee replacement in England and Wales which said that there was relation between floor number and levels of quality of life Conversely, this result was in disagreement with the study Dennis, et al., (2017) about Post-operative pain after total knee replacement , in Bristol, UK which found that there was no relation between levels of quality of life and socio-demographic characteristics of patients with total knee replacement. From point of view of researcher, this result may be due to majority of patients with total knee replacement were living on the first floor as a result this reduce overload or stress on their knees, also this is reduces fraction during ascending and descending.

Concerning factors associated with quality of life of patients with total knee replacement, the current study revealed that there was only significant relation between joint level factors and level of quality of life. This result was supported with the study Yakobov, et al., (2018) about Health and quality of life outcomes in Iran which explained that there was only relation between joint level factors and levels of quality of life of patients with total knee replacement. Conversely, this result was in consistent with the study Briani, et al., (2018) about Interventions can improve quality of life of individuals with knee replacement in Britain which found that there was no statistically significant relation between joint level factors and levels of quality of life of patients with total knee replacement.

CONCLUSION:

According to the findings of the current study, it can conclude that about two thirds of the studied patients had good quality of life. The highest percentage of good quality of life was Physical functioning domain followed by Mental Health domain. Also, there was only significant relation between joint level factors and levels of quality of life among patients with total knee replacement. Moreover, The majority of the studied patients had satisfactory in quality of life from 7 to12 months after surgery Meanwhile there was only significant relation between floor number and levels of quality of life.

RECOMMENDATION:

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

1. Before and after total knee replacement surgery, patients and their families should be given knowledge and practice through videos, models, and printed materials.
2. All total knee replacement patients should be engaged in rehabilitation Exercises**.**

Further Research: -

Comprehensive Training Program for Knee Rehabilitation after total knee replacement surgery.

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تدابير الرعاية الذاتية للمرضي بعد جراحة إستبدال الركبة وعلاقتها بجودة حياتهم

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الخلاصة

يظل الإستبدال الكلي لمفصل الركبة هو العلاج الجراحي للمرضى الذين يعانون من المرحلة الأخيرة من إلتهاب المفاصل وذلك لإستعادة جودة الحياة لدى مرضى التهاب مفاصل الركبة .**هدف البحث:** تقييم الرعاية الذاتية للمرضي بعد جراحة إستبدال الركبة على جودة حياتهم. **طرق وأدوات البحث:** أجريت الدراسه الهادفة علي100مريض من مرضي الإستبدال الكلي لمفصل الركبة المترددين علي العيادات الخارجية بمستشفى المنصورة الجامعي.حيث تم تجميع البيانات عن طريق إستمارة تدابير الرعاية الذاتية للمرضي بعد جراحة إستبدال الركبة وعلاقتها بجودة حياتهم و تتضمن أداتين ، الأداه الأولى : استبيان المقابلات المنظمة وتنقسم إلي جزئين،الجزءالأول:الخصائص الاجتماعية الديموجرافية ، الجزء الثاني : تاريخ المريض وعوامل مستوى المفاصل، الأداه الثانية:إستبيان تقييم جودة حياةالمريض.**النتائج:** أظهرت هذه الدراسة أن 62٪ من المرضى الخاضعين للدراسةكانوا يتمتعون بجودة حياة جيدة. أيضًا ، كانت العوامل الوحيدة المرتبطة بجودة الحياة لدى المرضى بعد جراحة الاستبدال الكلي للركبة هي عوامل مستوى المفاصل .**الإستنتاجات**: يمكن أن نستنتج أن معظم المرضى الخاضعين للدراسة يتمتعون بجودة حياة جيدة. كانت أعلى نسبة من جودة الحياة الجيدة هي مجال الأداء البدني يليه مجال الصحة العقلية. أيضا ، كانت هناك علاقة معنوية فقط بين عوامل مستوى المفاصل ومستويات جودة الحياة بين المرضى الذين يعانون من استبدال الركبة الكلي.

علاوة على ذلك ، كان معظمهم يشعر بالإرضاء الذاتي في جودة الحياة من 7 إلى 12 شهرًا بعد الجراحة. وفي الوقت نفسه ، كانت هناك علاقة ذات دلالة إحصائية فقط بين عدد الطوابق ومستويات جودة الحياة.

الكلمات المرشدة : الإستبدال الكلي للركبه، جودة الحياه.