# Evidence Based Nursing Guidelines and Patients' Quality of Life after Knee Replacement Surgery

**Shahenda Mohsen Abdallah Abdallah [1], Hayam Ahmed Mohamed [2], Nehal Mahmoud Abu Al-fadl [3], watanya kamel Attia[4]**

*1- Clinical instructor of Medical Surgical Nursing, Faculty of Nursing, Benha University, (2,3) Assistant Professor of Medical Surgical Nursing, Faculty of Nursing, Benha University.(4) Lecturer of Medical Surgical Nursing, Faculty of Nursing, Benha University.*

***Abstract:***

**Background:** Knee replacement (KR) surgery, also known as knee arthroplasty (KA), remains the surgical gold standard treatment for patients suffering from osteoarthritis (OA) to restore the quality of life in patient with knee osteoarthritis. **The aim of the study:** This study aimed to evaluate the effect of evidence-based nursing guidelines on patients' quality of life after knee replacement surgery. **Research design:** Quasi experimental research design **(pre/post)** was used to conduct the aim of this study. **Setting:** The study was conducted in orthopedic department affiliated to surgical department at Benha University Hospital, Qualyubia Governorate, Egypt. **Subjects:** A Convenience sample of all available adult (100) patients undergoing knee replacement surgery. **Tools:** Two tools were used; (1) Patients' structured interviewing questionnaire, it involved the patients' socio-demographic characteristics, medical history and patients' knowledge assessment including (knee joint, KR surgery and health practices regarding well balanced diet, exercises and physical activity, treatment and follow-up post KR surgery. (2) Patients' Quality of life Scale, it involved three domains physical, psychological and social domains. **Results:** The result of this study revealed that, the total mean score of patients' knowledge regarding knee replacement surgery was (21.18 ± 3.47) at pre guidelines implementation which changed to (34.74 ± 1.61) during immediate post, (33.36 ± 1.82) post 3 months and slightly declined to ( 31.03 ± 2.39) post 6 months period of guidelines implementation, with high significant differences (p= <0.001*) and patients' total mean score of quality of life was (51.38 ± 3.83) at pre implementation of nursing guidelines, which changed (47.27 ± 4.27 &31.92 ± 4.89) post 3 and 6 months of nursing guidelines implementation, with high significant differences (p= <0.001*). **Conclusion:** There was a marked improvement in knowledge and all subscales of quality of life about physical, psychological and social status among studied patients post nursing guidelines implementation. **Recommendations:** It is necessary to increase knowledge and awareness about KR in patient with advanced osteoarthritis, continuous development and updating of nursing guidelines for post-knee replacement care with a strong emphasis on patient education and early rehabilitation, regular follow- up for patient with KR to ensure effectiveness of surgery, avoiding complication and revision of KR and encouraging further research on the correlation between nursing interventions and patient quality of life after knee replacement surgery to ensure the provision of high-quality, evidence-based care. Further study should be conducted on larger sample size to assess quality of life among patients.

**Key words**: Nursing guidelines, Quality of life and Knee replacement surgery.

## Introduction

Knee replacement surgery is most commonly performed in individuals with knee osteoarthritis (OA), although it is also performed in patients with rheumatoid arthritis, fractures and malignancies. KR is the most effective surgical procedure to reduce pain, increase mobility and improve patients' health related quality of life (HRQOL) with demonstrably effective treatment in the short term follow-up **(González-Sáenz-de-Tejada et al., 2023).**

Despite the generally positive outcomes, some patients may face challenges in the recovery process, such as prolonged pain, stiffness or difficulty regaining full knee function. These challenges can impact the overall quality of life and highlight the importance of individualized care and support throughout the recovery journey. Moreover, psychological factors, such as patient expectations, mental health, and social support, have also been shown to influence the perceived quality of life after surgery **(Wright et al., 2023).**

Also, factors such as preoperative expectations, age, comorbidities, and the presence of postoperative complications can influence individual experiences and outcomes. Approximately 20% of patients reported persistent pain or functional limitations even years after the procedure. This underscores the importance of personalized patient care, including thorough preoperative counseling and postoperative follow-up to manage expectations and address any complications that may arise according to this study **(Zhang et al. 2024).**

A systematic review conducted by **(Smith et al. 2024)** found that over 85% of patients experienced significant pain reduction and enhanced mobility within the first six months post-surgery. These findings align with earlier research, emphasizing that the primary benefit of knee replacement is the alleviation of pain, which is often the primary motivator for patients undergoing this procedure. Pain relief is typically accompanied by a marked improvement in daily activities, such as walking, climbing stairs, and performing household tasks, leading to greater independence and overall life satisfaction **(Lopez et al., 2024).**

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 **( Mandour et al., 2022).**

The impact of knee replacement surgery on quality of life extends beyond physical health, influencing social and economic aspects as well. Patients who undergo knee replacement surgery often experience enhanced social participation and a return to work or leisure activities that were previously limited by knee pain. This not only improves their social well-being but also reduces the economic burden associated with chronic disability. The economic benefits are particularly significant for working-age patients, as successful knee replacement can lead to increased productivity and reduced absenteeism (**Harrison et al. 2024).**

**Significance of the study:**

knee replacement (KR) 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. In the United States, around 750,000 knee replacement procedures are performed each year (**Mandour., 2022).** In Egypt, There are 10 to 15 thousand knee replacements annually **(EIGanzory, 2016).** The number of patients of undergoing knee replacement surgery was (130) cases annualy **(Benha University Hospital Statistical Office, 2022).**

**Aim of the study:**

**This study aimed to** evaluate the effect of evidence based nursing guidelines on patients' quality of life after knee replacement surgery.

**Research Hypothesis:**

**H1**-The mean score of patients' knowledge could be significally higher post implementing nursing guidelines.

**H2-** The mean score of Patients' quality of life could be significally higher post implementing nursing guidelines.

**H3**-There could be a significant correlation between patients' knowledge and their quality of life.

**II. Subjects and Method**

**Design:** Quasi-experimental design study was used to conduct the study.

**Settings:** The study was conducted in orthopedic department affiliated to surgical department at Benha University Hospital, Qalyubia Governorate, Egypt.

**Subjects:** A Convenience sample of all available adult (100) patients undergoing knee replacement surgery from the previously mention setting within ٦ months ago. The sample size was calculated based on the previous year's census reported admission in the orthopedic department at Benha University Hospital (**Benha University admission office census 2022)**.

Utilizing the following formula **(Tejada and Punzalan, 2012).**

$$n = \frac{N}{1 + N\,(e)2}$$

Where:

n= sample size (100).

N= total population (130).

e= margin error (0.05).

**Tools for data collection:**

**Tool I: Structured interviewing questionnaire;** This tool was designed by the researcher and translated into Arabic language after reviewing recent relevant literatures and scientific references. It was adapted from (***De Klerk et al., 2023)*.** It involved the following three parts as the following:

**First part:** It concerned with patients' demographic characteristics: This part concerned with the assessment of patients' personal data related to their age, sex, marital status, level of education, occupation, residence and the floor which lives in.

**Second part: patients' medical history**, this part designed to assess patients' past and family history. It composed of 10 questions related to patients' family history, duration of knee replacement operation, causes of performing knee replacement operation, type of knee replacement operation.

**Third part: Patients' knowledge assessment:**

It aimed to assess patients' the patients' knowledge regarding KR surgery and it consisted of 38 items divided into (3) sections as follows:

**Section 1:** It concerned with patients' knowledge about knee joint, it included (9) questions about anatomy and physiology of the knee joint, how many bones, ligaments in the knee joint and what causes leading to erosion and changes of knee joint.

**Section 2:** It concerned with patients' Knowledge about KR surgery, it included (7) questions about meaning of knee replacement, causes that leads to knee replacement operation, importance of knee replacement operation, types of operation of knee replacement, measures for diagnosis the need of knee replacement operation and complication of knee replacement.

**Section 3:** It concerned with patients' Knowledge about health practices after KR surgery, it included (22) questions about Nutrition which included (11) questions, Knowledge about exercise which included (7) questions and Knowledge about Medication and follow-up which included (4) questions**.**

**patients' knowledge Scoring system:**

The scoring system of knowledge for patients with KR was calculated as follows one score for correct answer and zero score for incorrect answer. 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. The total knowledge score (=38) score and was considered satisfactory if the score of the total knowledge ≥28 score, while considered Unsatisfactory if it is <28 score.

**Tool II: Patients' Quality of life Scale after knee replacement surgery:** This scale for patient with knee replacement which is a short-form of 36 which adapted from **(Batarfi et al., 2018).** It scale is measured on a likert type scale of (always, sometimes and never). It involved three domains physical, psychological and social domain of patient with KR:

**1- Physical domain which included (16) items**

**2-Psychological domain which included (10) items.**

**3- Social domain which included (6) items.**

**Scoring system of patients' quality of Life scale:**

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 never, one scores for sometimes and two scores for always. For each area of quality of life the score of items was summed- up and multiply by 2 the total number of items giving the mean score for the part. So, the total score is 62 score.

**Evidence based nursing guidelines**:

The guidelines were designed by the researcher based on review of recent related literatures and scientific references **(Larry, L. 2019; West, M,. 2023)** and based on patient initial assessment need. It aimed to promote patient knowledge and quality of life after knee replacement surgery. The designed guidelines were developed and constructed by the researcher in the form of booklet, media and power point. The booklet covered all information about KR surgery, it divided into two parts as follow:

**Part I: The theoretical part;** it aimed to improve patients' knowledge related KR surgery (definition of KR surgery, causes& risk factors , importance, types, , diagnosing ,complication and instructions after knee replacement surgery).

**Part II: The practical part;** it aimed to provide the basis of nursing self care guidelines to improve patients' quality of life after KR surgery as (proper nutrition, exercise, medication and follow-up).

**Ethical considerations:**

The research approval was obtained from the ethical committee in the faculty of nursing before starting the study, the researcher clarified the objectives and aim of the study to patients' included in the study and assured maintaining anonymity and confidentiality of subjects and patients' were informed th at they are allowed to choose to participate or not in the study and they have the right to withdraw from the study at any time without any consequences, verbal consent was obtained from each participants enrolled into the study and all information were gathered used only for their benefit of data and for the purpose of the study.

**II. Preparatory phase:** This phase included reviewing the related literature and scientific research. During this phase, the researcher also visited the study setting to be acquainted with the personnel and setting using evidence-based articles, internet periodicals and magazines in order to collect tools of this study.

**Content validity:**

The face and content validity were ascertained for comprehensiveness, relevance, simplicity, clarity and ambiguity through a panel of five experts from medical surgical nursing department Faculty of Nursing, Benha University, consisted of two professor and three assistant professor. Also, the developed guidelines which covered all items related to knee replacement surgery based on recent current literature was revised by the same experts and all recommended modifications were done.

**Tools reliability:**

All tools of the study were tested statistically for its reliability, it was determined using Cranach's alpha coefficient which was 0.820, qol scale 0.860. This only proves that this tool is an instrument with good reliability.

Total knowledge =38

Satisfactory ≥ 28 score

Un satisfactory <28 score

**Pilot study:**

Pilot study was conducted on 10 % of studied sample (10 patients) in orthopedic department at Benha University Hospital in order to test the clarity and applicability of the study tools and the program, also to estimate the time required for each tool to be filled by the researcher as well as to identify any possible obstacles that may hinder data collection. Based on the results of the pilot study the necessary modifications were done for more applicable tools to collect data. The patients selected for the pilot study were excluded from the study subjects.

**III. Field of work:**

Data collection of the study was carried out through six months, at the beginning of June 2024 till the end of November 2024, the researcher attended the setting three days (Saturday, Monday and Wednesday) per week. from 9 am to 1 pm to collect data from patients with knee replacement. The average time needed for the sheet was around 30/minutes for each patient, the average number interviewed were 3-5 KR patients/day depending on their responses of the interviewers. The study was conducted through four phases:

**-Assessment phase (pre-test):**

Once the researcher explained the aim of the study to all participants in simple Arabic words, the researcher interview the patients individually and assessed them using the structured interview questionnaire **(Tool I)** concerning their sociodemographic characteristic, medical history and patient knowledge. Finally, the researcher asked the patients about their quality of life using **(Tool II )** as a baseline data before the implementation of the nursing guidelines.

**Planning phase:**

Once the initial assessment was finished, the guidelines were designed based on individual needs. The researcher set up a teaching plan covering general and specific objectives.Teaching materials were prepared e.g. booklet media and power point will help in covering theoretical and practical information. The researcher determined the timetable of sessions with the patients for starting program sessions.

**The implementation phase (The guidelines intervention):** In this phase the researcher implemented the patients' program sessions in the form of four session (Appendix V1). The duration of each session lasted about 30-45 minutes/ day for average number of 5-7 patients included in the session. The researcher interviewed the patient 3 days per week. An orientation to the intervention and its process were presented. Each session started with a brief summary about what had been given through the previous session, then the objectives of the new topics, taking into consideration the use of simple language to suite the level of all patients' education. Discussion, feedback and reinforcement during the intervention sessions were used to enhance learning. At the end of each session the researcher allowed for patients to ask questions to correct any misunderstanding.

**The content of the sessions was divided as the following steps:**

**-Session one (Theoretical session):** Explanation (definition of the knee replacement, causes and risk , factors, types, importance, diagnosis, instructions, complications post knee replacement surgery).

**-Session two:** It included instruction about the well-balanced diet that the patient should be taken after KR surgery.

**-Session three (Practical session):** It included instruction about exercises that the patient should be practiced and avoided after KR surgery to improve the quality of life.

**-Session four:** It included instruction about medication and regular follow-up that the patient should be done after KR surgery.

**Evaluation phase:** It aimed to evaluate the effect of evidence-based nursing guidelines on patients' knowledge and quality of life by using the same data collection tools through the following phases:

**-Phase1:** Immediately post-test evaluation was performed after implementing the evidence-based nursing guidelines preoperatively (following the teaching session) to evaluate the effectiveness of the guidelines on patients' knowledge **(utilizing tool I)** in order to compare the changes in the studied patients' knowledge.

**-Phase 2:** Evaluation was done after 3&6 months postoperative for following evaluation of patients' knowledge and quality of life **(utilizing Tool I & Tool II)** Comparing between pre and post data collected**.**

**Results:**

**Table (1):** Illustrates the socio-demographic characteristics of the studied patients. It revealed that 49.0% of the studied patients their ages ranged from 50-60 years old with a mean age of 49.13 ± 1.041 years, 60% were females and 71% were married. Concerning occupation 41% of the patients had sedentary work, 44% had intermediate qualification, 56 % lived in urban areas and 40% lived in second or third floors.

**Table (2):** Shows frequency distribution of medical history. It revealed that the majority (78.0%) of the studied patients had 36% of the studied patients were diagnosed with knee arthritis from 5-< 10 years, 33% has positive family history of first degree among 45.5% of them, 53% had previous information about knee arthritis , 49.1% of them had their information from medical team, moreover 41% had knee replacement surgery, especially partial replacement among 34.1%, they reported that the cause of surgery was due to inability to do normal daily activities among 97.6% of them and 48.8% had previous incidence of complications post knee replacement surgery, with the most prevalent complication was incidence of inflammation at the site of surgery among 35%.

**Table (3):** shows that there was highly statistically significant difference regarding to the total mean score of patients' knowledge regarding knee replacement surgery throughout different study periods at (p= <0.001). As Basic patients' knowledge regarding knee joint was the highest mean precent score of knowledge post 6 months followed by healthy practices of healthy balanced diet post knee replacement surgery (86.4% & 81.9%, respectively). Where, the total mean was (21.18 ± 3.47) at pre guidelines implementation which changed to (34.74 ± 1.61) during immediate post, (33.36 ± 1.82) post 3 months and slightly declined to ( 31.03 ± 2.39) post 6 months period of guidelines implementation.

**Figure(1):** Illustrates that there was highly statistically significant difference in total knowledge levels throughout different study periods. Where, 27% of studied patients had satisfactory level of total knowledge about knee replacement surgery pre guidelines implementation, while they had satisfactory knowledge level at immediate post, post 3 and 6 months periods of guidelines implementation among(88%,85%&82%,respectively).

**Table (4):** shows that there was a marked improvement in all dimension of quality of life about physical, psychological and social status among studied patients post implementation of nursing guidelines with a highly statistically significant difference at (P= < 0.001). As psychological status was of highest mean percent score of quality of life dimensions post 6 months followed by physical health status (62.2% & 48%, respectively), with total mean score (51.38 ± 3.83) at pre implementation of nursing guidelines, which changed (47.27 ± 4.27 &31.92 ± 4.89) post 3 and 6 months of nursing guidelines implementation.

**Table (5):** reveals that there was statistically significant relation between the patients' educational level and their total mean score of knowledge at immediate post, 3 months post and 6 months of nursing guidelines implementation at (P=<0.05).

**Table (6):** reveals there was statistically significant difference between patients' medical history in items (time since diagnosis with knee arthritis and previous incidence of complications post knee replacement surgery) with their total mean score of knowledge at pre, immediate post and post 6 months of nursing guidelines implementation at (P= < 0.05).

**Table (7):** shows there was statistically significant relation between total patients' educational level and their total quality of life mean score throughout study phases of nursing guidelines implementation at (P= > 0.05).

**Table (8):** reveals there was no statistically significant relation between patients' medical history and their total mean score of quality of life throughout the study phases of nursing guidelines implementation except at pre guidelines at (P= > 0.05) and there were relation with item (time passed since diagnosis with knee arthritis).

**Table (9):** clarifies that there was a negative and significant correlation between total patients' knowledge with their total quality of life score pre, post 3 and 6 months periods of guidelines implementation with p-value (0.004*, 0.039*, & 0.007*, respectively ).

**Table (1): Frequency distribution and percentage of the studied patients regarding to their personal data (n=100).**

| Patients' personal data | (No.) | % |
|---|---|---|
| **Age (years)** | | |
| 20- < 30 | 12 | 12.0 |
| 30- < 40 | 12 | 12.0 |
| 40- < 50 | 27 | 27.0 |
| 50 – 60 | 49 | **49.0** |
| ¯ ± **SD** | 49.13 ± 1.041 | |
| **Gender** | | |
| Male | 40 | 40.0 |
| Female | 60 | **60.0** |
| **Marital status** | | |
| Single | 4 | 4.0 |
| Married | 71 | **71.0** |
| Widowed | 13 | 13.0 |
| Divorced | 12 | 12.0 |
| **Educational Level** | | |
| Can't read and write | 11 | 11.0 |
| Read and write | 26 | 26.0 |
| Intermediate qualification | 44 | **44.0** |
| High qualification | 19 | 19.0 |
| **Occupation** | | |
| Sedentary work | 41 | **41.0** |
| Manual work | 14 | 14.0 |
| Not working | 21 | 21.0 |
| Housewife | 24 | 24.0 |
| **Residence** | | |
| Urban | 56 | **56.0** |
| Rural | 44 | 44.0 |
| **Floor where the patient lives** | | |
| Ground | 33 | 33.0 |
| second or third floors | 40 | **40.0** |
| Upper floors | 27 | 27.0 |

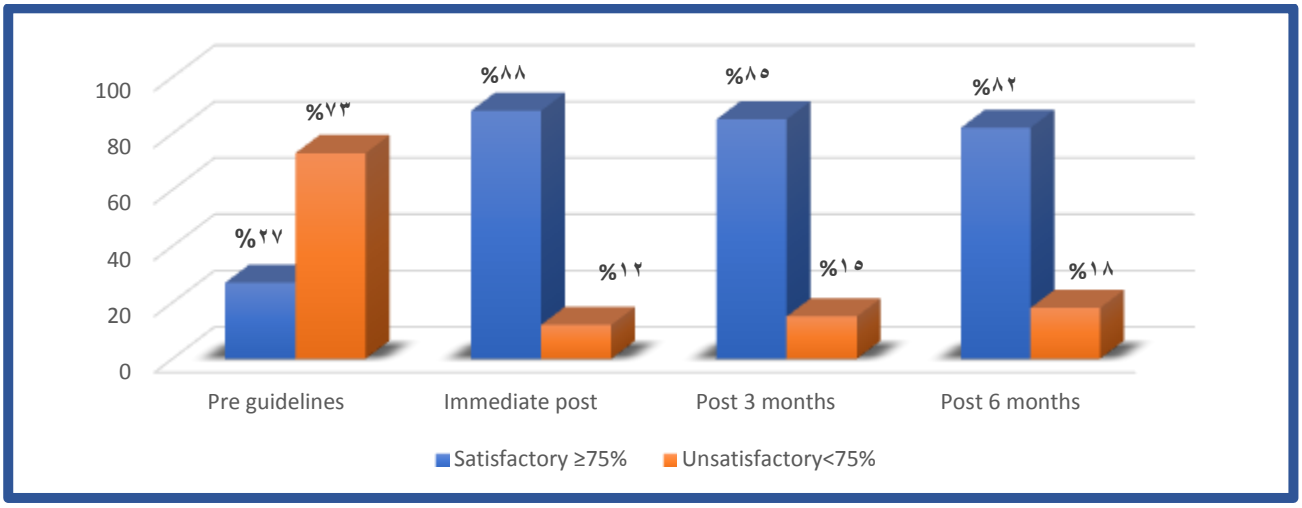
**Table (2): Frequency distribution and percentage ofthe studied patients according to their medical history (n=100).**

| Patients' medical history | (No.) | % |
|---|---|---|
| **Time since diagnosis with knee arthritis** | | |
| < 3 years | 16 | 16.0 |
| 3-< 5 years | 26 | 26.0 |
| 5-<10 years | 36 | **36.0** |
| ≥10 years | 22 | 22.0 |
| **Presence of family history with knee arthritis** | | |
| Yes | 33 | 33.0 |
| No | 67 | **67.0** |
| **If yes, the degree of kinship (n=33)** | | |
| First degree | 15 | **45.5** |
| Second degree | 11 | 33.3 |
| Third degree | 6 | 18.2 |
| Fourth degree | 1 | 3.0 |
| **Having previous information about knee arthritis** | | |
| Yes | 53 | **53.0** |
| No | 47 | 47.0 |
| **If yes, the source of information is (n=53)** | | |
| Medical team | 26 | **49.1** |
| Internet | 17 | 32.1 |
| Radio and TV | 6 | 11.3 |
| Patients with similar medical problem | 4 | 7.5 |
| **Had knee replacement** | | |
| Yes | 41 | 41.0 |
| No | 59 | **59.0** |
| **If yes, the type of surgery is (n= 41)** | | |
| Total knee replacement | 13 | 31.7 |
| Partial knee replacement | 14 | **34.1** |
| Patellar replacement | 7 | 17.1 |
| Total Composite Replacement of Knees | 7 | 17.1 |
| **Causes of knee replacement surgery (n= 41) #** | | |
| Severe pain in the knee joint | 22 | 53.6 |
| Stiffness in the joint | 19 | 46.4 |
| Having difficulty walking | 19 | 46.4 |
| Inability to do normal daily activities | 40 | **97.6** |
| **Previous incidence of complications post knee replacement surgery (n= 41)** | | |
| Yes | 20 | 48.8 |
| No | 41 | **51.2** |
| **If yes, the complications occurred (n=20)** | | |
| Bleeding at the site of surgery | 4 | 20.0 |
| occurrence of blood clots in the legs | 3 | 15.0 |
| Inflammation at the site of surgery | 7 | **35.0** |
| Wound infection | 6 | 30.0 |

**Table (3 ): Comparison betweeen the total mean of patients' knowlege regarding knee replacement throughout study periods (n=100).**

| Total Knowledge | Max score | Pre-nursing guidelines (n=100) Mean ± SD | % of mean | Immediately post nursing guidelines (n=100) Mean ± SD | % of mean | 3 months Post nursing guidelines (n=100) Mean ± SD | % of mean | 6 months Post nursing guidelines (n=100) Mean ± SD | % of mean | $\chi^2$ test P value (1) | $\chi^2$ test P value (2) | $\chi^2$ test P value (3) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic patients' knowledge regarding knee joint | 9 | 4.26 ± 1.78 | 47.3% | 8.20± 0.81 | 91.1% | 8.05± 0.77 | 89.4% | 7.78 ± 0.98 | **86.4%** | -23.963 <0.001** | -23.822 <0.001** | -21.356 <0.001** |
| Basic patients' knowledge regarding knee replacement surgery | 7 | 3.90± 1.29 | 55.7% | 6.29 ± 0.74 | 89.8% | 6.03 ± 0.97 | 86.1% | 5.62 ± 1.06 | 80.2% | -19.052 <0.001** | -17.229 <0.001** | -12.968 <0.001** |
| Healthy practices of healthy balanced diet post knee replacement surgery | 11 | 4.39 ± 2.38 | 39.9% | 10.10 ± 0.85 | 91.8% | 9.57 ± 0.99 | 87.0% | 9.01 ± 1.25 | **81.9%** | -16.856 <0.001** | -13.821 <0.001** | -11.711 <0.001** |
| Healthy practices of exercise and physical activities post knee replacement surgery | 7 | 4.47 ± 1.05 | 63.8% | 6.47 ± 0.54 | 92.42% | 6.24 ± 0.76 | 89.1% | 5.49 ± 1.01 | 78.4% | -19.704 <0.001** | -18.390 <0.001** | -7.926 <0.001** |
| Commitment to the treatment regimen and follow-up post knee replacement surgery | 4 | 2.17 ± 0.99 | 54.2% | 2.68 ± 0.48 | 67.0% | 3.47 ± 0.61 | 86.7% | 3.13 ± 0.73 | 78.2% | -15.101 <0.001** | -14.030 <0.001** | -9.560 <0.001** |
| Total | 38 | **21.18 ± 3.47** | - | **34.74 ± 1.61** | - | **33.36 ± 1.82** | | **31.03 ± 2.39** | - | **-40.485 <0.001**** | **-39.180 <0.001**** | **-31.852 <0.001**** |

**Figure(1). Comparison betweeen the studied patients' total knowledge about knee replacement surgery throughout study phases (n=100)**




** Highly Significant at p ≤0.001.
(1) Difference between knowledge pre and immediately post nursing guidelines implementation
(2) Difference between knowledge pre and 3 months post nursing guidelines implementation
(3) Difference between knowledge pre and 6 months post nursing guidelines implementation

## Table (4 ): Comparison between the total mean score of the studied patients' quality of life throughout study periods (n=100).

| Quality of life dimensions | Max score | Pre-nursing guidelines (n=100) Mean ± SD | % of mean | 3months Post nursing guidelines (n=100) Mean ± SD | % of mean | 6 months Post nursing guidelines (n=100) Mean ± SD | % of mean | t test P value (1) | t test P value (2) |
|---|---|---|---|---|---|---|---|---|---|
| Physical health status | 32 | 25.61 ± 2.82 | 80.0% | 23.17± 3.09 | 72.4% | 15.38 ± 3.38 | 48.0% | - 30.257 (<0.001**) | - 23.093 (<0.001**) |
| Psychological status | 18 | 15.57 ± 1.67 | 86.5% | 14.62 ± 1.98 | 81.2% | 11.21 ± 2.24 | 62.2% | - 24.062 (<0.001**) | - 15.021 (<0.001**) |
| Social status | 12 | 10.20 ± 1.48 | 85.0% | 9.48 ± 1.78 | 79.0% | 5.33 ± 1.78 | 44.4% | - 24.310 (<0.001**) | - 18.453 (<0.001**) |
| Total | 62 | 51.38 ± 3.83 | - | 47.27 ± 4.27 | - | 31.92 ± 4.89 | - | - 43.951 (<0.001**) | - 31.883 (<0.001**) |

* Significant at p ≤0.05. **Highly significant at p ‹0.001.
(1) Difference between total quality of life pre and 3 months post nursing guidelines implementation
(2) Difference between total quality of life pre and 6 months post nursing guidelines implementation

**Table (5): Relation between patients' personal data and their total mean score of knowledge throughout study phases of nursing guidelines implementation (n=100)**

| Personal data | Variables | Total mean score of knowledge | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pre nursing guidelines | Test P value | Immediate post nursing guidelines | Test P value | Post 3 months of nursing guidelines | Test P value | Post 6 months of nursing guidelines | Test P value |
| | | ⁻ ± SD | | ⁻ ± SD | | ⁻ ± SD | | ⁻ ± SD | |
| **Age** | 20- < 30 | 19.58± 3.47 | **F = 2.954 0.036*** | 34.41± 1.44 | **F = 0.213 0.887 n.s** | 32.50± 1.73 | **F = 1.115 0.347 n.s** | 30.16± 1.94 | **F = 1.261 0.292 n.s** |
| | 30- < 40 | 23.58±2.27 | | 34.83±1.40 | | 33.75±1.35 | | 31.16±1.64 | |
| | 40- < 50 | 21.03± 3.98 | | 34.85± 1.56 | | 33.40± 2.18 | | 31.66± 2.41 | |
| | 50 – 60 | 21.06±3.20 | | 34.73±1.75 | | 33.44±1.72 | | 30.85±2.59 | |
| **Gender** | Male | 21.52± 3.35 | **T=0.809 0.421 n.s** | 34.90± 1.56 | **T=0.809 0.420 n.s** | 33.45± 1.98 | **T=0.400 0.690 n.s** | 31.12± 2.12 | **T=0.322 0.748 n.s** |
| | Female | 20.95±3.56 | | 34.63±1.64 | | 33.30±1.73 | | 30.96±2.57 | |
| **Marital status** | Single | 21.25± 4.99 | **F = 0.048 0.986 n.s** | 34.75± 2.98 | **F = 0.581 0.629 n.s** | 33.00± 2.70 | **F = 0.246 0.864 n.s** | 31.00± 2.44 | **F = 0.233 0.873 n.s** |
| | Married | 21.09±3.30 | | 34.61±1.47 | | 33.30±1.82 | | 30.92±2.48 | |
| | Widowed | 21.46± 4.46 | | 34.92± 1.70 | | 33.38± 2.02 | | 31.53± 2.47 | |
| | Divorced | 21.33±3.22 | | 35.25±1.86 | | 33.75±1.48 | | 31.08± 1.97 | |
| **Educational level** | Can't read and write | 20.81± 2.04 | **F = 1.482 0.224 n.s** | 34.45± 1.03 | **F = 8.797 <0.001**** | 33.09± 1.70 | **F = 5.174 0.002*** | 30.18± 1.72 | **F = 3.219 0.026*** |
| | Read and write | 20.07±3.18 | | 33.65±1.71 | | 32.30±1.80 | | 30.07±2.66 | |
| | Intermediate qualification | 21.84± 3.30 | | 35.00± 1.46 | | 33.72± 1.59 | | 31.45± 2.30 | |
| | High qualification | 21.36±4.58 | | 35.78±1.18 | | 34.10±1.91 | | 31.84±2.11 | |
| **Occupation** | Sedentary work | 21.87± 3.59 | **F = 1.119 0.345 n.s** | 34.73± 1.34 | **F = 1.413 0.244 n.s** | 33.31± 2.00 | **F = 0.616 0.606 n.s** | 31.14± 2.35 | **F = 0.896 0.446 n.s** |
| | Manual work | 20.28±2.97 | | 35.28±1.63 | | 33.85±1.16 | | 31.57±1.86 | |
| | Not working | 20.52± 3.28 | | 34.95± 1.82 | | 33.47± 1.74 | | 31.19± 2.37 | |
| | Housewife | 21.08±3.65 | | 34.25±1.77 | | 33.04±1.92 | | 30.37±2.74 | |
| **Residence** | Urban | 20.66± 3.22 | **T=-1.701 0.092 n.s** | 34.60± 1.55 | **T=-0.929 0.355 n.s** | 32.94± 1.82 | **T=-2.626 0.010*** | 30.80± 2.29 | **T=-1.066 0.289 n.s** |
| | Rural | 21.84±3.71 | | 34.90±1.68 | | 33.88±1.71 | | 31.31±2.51 | |

(n.s) Not Statistically Significant at >0.05 (*) Statistically Significant at ≤0.05 (**) Highly statistically significant at ≤0.001

**Table (6): Relation between patients' medical history and their total mean score of knowledge throughout study phases of nursing guidelines implementation (n=100)**

| Medical history | Variables | Total mean score of knowledge | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pre nursing guidelines | Test P value | Immediate post nursing guidelines | Test P value | Post 3 months of nursing guidelines | Test P value | Post 6 months of nursing guidelines | Test P value |
| | | ¯□ ± SD | | ¯□ ± SD | | ¯□ ± SD | | ¯□ ± SD | |
| **Time since diagnosis with knee arthritis** | < 3 years | 18.68± 3.00 | F = 10.694 <0.001** | 34.00± 1.31 | F = 3.400 0.021* | 32.12± 1.20 | F = 3.279 0.024 * | 29.81± 1.22 | F = 2.451 0.068 n.s |
| | 3-< 5 years | 19.46±3.25 | | 34.26±1.82 | | 33.38±1.79 | | 30.69±2.92 | |
| | 5-<10 years | 22.69± 3.11 | | 35.11± 1.42 | | 33.66± 1.86 | | 31.50± 2.19 | |
| | ≥10 years | 22.54±2.73 | | 35.22±1.57 | | 33.72±1.90 | | 31.54±2.42 | |
| **Presence of family history with knee arthritis** | Yes | 21.81± 3.70 | T=1.293 0.199 n.s | 35.06± 1.39 | T=1.403 0.164 n.s | 33.93± 1.47 | T=2.270 0.025* | 31.39± 2.31 | T=1.066 0.289 n.s |
| | No | 20.86±3.34 | | 34.58±1.69 | | 33.07±1.92 | | 30.85±2.43 | |
| **Had knee replacement** | Yes | 22.07± 3.30 | T=2.182 0.032 * | 35.29± 1.40 | T=2.969 0.004 * | 33.07± 1.84 | T=1.596 0.114 n.s | 31.70± 2.22 | T=2.412 0.018 * |
| | No | 20.55±3.48 | | 34.35±1.64 | | 33.11±1.79 | | 30.55±2.41 | |
| **Previous incidence of complications post knee replacement surgery** | Yes | 20.85± 3.40 | T=-0.473 0.637 n.s | 34.40± 1.63 | T=-1.055 0.294 n.s | 33.05± 1.60 | T=-0.846 0.399 n.s | 30.20± 1.90 | T=-1.749 0.660 n.s |
| | No | 21.26±3.51 | | 34.82±1.60 | | 33.43±1.88 | | 31.23±2.47 | |

(n.s) Not Statistically Significant at >0.05 (*) Statistically Significant at ≤0.05 **(****)** Highly statistically significant at ≤0.001

**Table (7): Relation between patients' personal data and their total quality of life mean score throughout study phases of nursing guidelines implementation (n=100)**

| Personal data | Variables | Total mean score of quality of life | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pre nursing guidelines | Test P value | Post 3 months of nursing guidelines | Test P value | Post 6 months of nursing guidelines | Test P value |
| | | ¯□ ± SD | | ¯□ ± SD | | ¯□ ± SD | |
| **Age** | 20- < 30 | 51.25± 3.46 | F = 0.174 0.914 n.s | 47.58± 3.75 | F = 0.140 0.936 n.s | 32.58± 5.23 | F = 0.567 0.638 n.s |
| | 30- < 40 | 50.66±3.36 | | 47.75±3.46 | | 30.91±2.74 | |
| | 40- < 50 | 51.44± 4.09 | | 46.88± 4.18 | | 31.22± 5.30 | |
| | 50 – 60 | 51.55±3.95 | | 47.28±4.69 | | 32.38±5.02 | |
| **Gender** | Male | 51.35± 4.09 | T=-0.064 0.949 n.s | 47.65± 4.95 | T=0.724 0.471 n.s | 32.50± 5.09 | T=0.968 0.336 n.s |
| | Female | 51.40±3.67 | | 47.01±3.77 | | 31.53±4.75 | |
| **Marital status** | Single | 51.50± 5.19 | F = 0.595 0.620 n.s | 49.25± 4.57 | F = 0.674 0.570 n.s | 32.00± 5.09 | F = 0.060 0.981 n.s |
| | Married | 51.60±3.69 | | 47.15±4.42 | | 32.04±5.03 | |
| | Widowed | 51.38± 4.71 | | 48.15± 4.07 | | 31.61± 4.07 | |
| | Divorced | 50.00± 3.33 | | 46.33± 3.52 | | 31.50± 5.31 | |
| **Educational level** | Can't read and write | 51.72± 4.62 | F=3.596 0.016* | 50.18± 3.89 | F=2.838 0.042* | 35.90± 4.52 | F=11.217 <0.001** |
| | Read and write | 53.19±2.82 | | 47.73±4.94 | | 34.65±4.74 | |
| | Intermediate qualification | 50.93±4.03 | | 47.04± 4.00 | | 30.59± 4.38 | |
| | High qualification | 49.73±3.26 | | 45.63±3.80 | | 28.94±2.95 | |
| **Occupation** | Sedentary work | 52.48± 2.90 | F=3.932 0.011* | 48.60± 4.22 | F=3.229 0.026* | 33.17± 5.09 | F=1.678 0.177 n.s |
| | Manual work | 52.50±4.03 | | 46.42±5.38 | | 31.71± 4.92 | |
| | Not working | 50.33± 4.41 | | 47.52± 4.20 | | 30.66± 5.18 | |
| | Housewife | 49.70±3.87 | | 45.37±3.29 | | 31.00±3.94 | |
| **Residence** | Urban | 51.33±3.54 | T=-0.090 0.928 n.s | 46.62± 4.27 | T=-1.773 0.079 n.s | 31.66± 5.31 | T=-0.596 0.553 n.s |
| | Rural | 51.40±4.17 | | 48.15±4.31 | | 32.25±4.33 | |

(n.s) Not Statistically Significant at >0.05 (*) Statistically Significant at ≤0.05 **(****) Highly statistically significant at ≤0.001

**Table (8): Relation between patients' medical health history and their total mean score of quality of life throughout study phases of nursing guidelines implementation (n=100)**

| Medical history | Variables | Total mean score of quality of life | | | | | |
|---|---|---|---|---|---|---|---|
| | | Pre nursing guidelines | Test P value | Post 3 months of nursing guidelines | Test P value | Post 6 months of nursing guidelines | Test P value |
| | | ⁻ ± SD | | ⁻ ± SD | | ⁻ ± SD | |
| **Time since diagnosis with knee arthritis** | < 3 years | 53.06± 3.04 | F=3.159 0.028* | 47.37± 4.78 | F=1.395 0.249 n.s | 32.12± 3.64 | F=0.576 0.632 n.s |
| | 3-< 5 years | 51.30±3.86 | | 48.42±3.79 | | 32.34±3.90 | |
| | 5-<10 years | 51.80± 3.60 | | 46.22± 3.81 | | 31.08± 5.07 | |
| | ≥10 years | 49.50±4.05 | | 47.68±5.22 | | 32.63±6.33 | |
| **Presence of family history with knee arthritis** | Yes | 51.18± 3.98 | T=-0.344 0.731 n.s | 47.48± 4.40 | T=298 0.767 n.s | 32.78± 5.67 | T=1.249 0.215 n.s |
| | No | 51.46±3.75 | | 47.20±4.33 | | 31.49±4.44 | |
| **Had knee replacement** | Yes | 50.87± 3.89 | T=-1.075 0.285 n.s | 46.92± 4.69 | T=-0.715 0.476 n.s | 31.56± 4.70 | T=-0.610 0.543 n.s |
| | No | 51.71±3.75 | | 47.55±4.09 | | 32.16±5.04 | |
| **Previous incidence of complications post knee replacement surgery** | Yes | 52.15± 4.05 | T=1.022 0.309 n.s | 47.35± 4.51 | T=0.057 0.954 n.s | 32.15± 4.17 | T=0.234 0.816 n.s |
| | No | 51.17±3.75 | | 47.28±4.32 | | 31.86±5.07 | |

(n.s) Not Statistically Significant at >0.05 (*) Statistically Significant at ≤0.05

**Table (9): Correlation between total knowledge with quality of life scores among the studied patients pre, post 3 and 6 months periods of nursing guidelines implementation (n=100)**

| | Study periods | Total knowledge score | |
|---|---|---|---|
| | | R | P value |
| **Total quality of life score** | Pre nursing guidelines | -0.288 | 0.004* |
| | Post 3 months of nursing guidelines | -0.207 | 0.039* |
| | Post 6 months of nursing guidelines | -0.266 | 0.007* |

*** Significant at p ≤0.05**

**Discussion**

Knee replacement surgery (KR), also known as knee arthroplasty (KA), is a surgical operation that involves the replacement of a damaged knee joint with an artificial one. It is a procedure that is used to treat persistent refractory knee pain and function loss caused by a variety of underlying knee problems. KA is most commonly performed in individuals with knee osteoarthritis (OA), although it is also performed in patients with rheumatoid arthritis, fractures, and malignancies **(Sun et al, 2022).**

According to age, the current study revealed that, about less than half patients their age ranged from 50-60 years with a mean age of 49.13 ± 1.041 years. From the researcher point of view this attributed to the musculoskeletal system's aging changes make people more susceptible to osteoarthritis which considers the main indication of Knee Replacement Surgery. The current result concurs with **Taha & Ibrahim (2021**) findings who conducted a study entitled "Effect of Educational Program on Nurses' Knowledge, Practices and Patients' Outcomes Post Total Knee Arthroplasty" who stated that the majority of the study group and over half of the control group were between the ages of 51 and 60.

Regarding gender, the results of the present study revealed that less than two thirds of them were females. This finding may be due to osteoporotic changes that occur in women after menopause due to variation in some factors such as anatomic structures, genetic issues, hormonal influences **Lu et al., (2021).**This finding is consistent with **Rittharomya et al., (2020)** who conduct a study about "The Effectiveness of Preoperative Quadriceps Exercise and Diet Control Program for Older Adults Waiting for Total Knee Arthroplasty" discovered that women made up the "majority of both groups.

Concerning marital status, the present study revealed that, less than three quarters of the studied patients were married. These findings were supported with agreement with **Mandour et al., (202٢)** who conducted a study about "Quality of Life for Patients After Total Knee Replacement Surgery" and reported that about two thirds of the sample were married.

Concerning occupation, less than half of them had sedentary work, this result was contradicted with **Xing et al., (2020)** who made a study about" Factors influencing selfcare in outpatients with external fixation in China" who
found that more than half of participants engaged in work that requires physical activity.

Concerning of education level, the current study's findings showed that less than half of them had intermediate qualifications. which is supported by **Bazied et al. (2022)** who conducted a study entitled " The effects of a home-based exercise intervention on elderly patients with knee osteoarthritis: a quasi-experimental study " and found that the majority of the sample under study had a high school diploma.

As regards residence, it was observed that more than half of them lived in urban areas and less than half of them lived on the second or third floors. The result comes in consistent with **Mohamed et al., (2020)** who conducted a study entitled "Nurses Performance Regarding Orthopedic Patients with External Fixation at Zagazig University Hospitals" and found that half of sample studied live in rural.

According to the medical history of the studied patients the result of the present study Presented that, that more than one third of patients were diagnosed with knee arthritis for 5-< 10 years. These findings are consistent with those of **Taha & Ibrahim (2021).** They found that knee problems dating back more than ten years were reported by two-fifths of the study and control groups.

According to family history, more than two third of the studied patients had family history with knee arthritis and one third of them had a positive family history of first degree among nearly half of them. These findings were in an agreement with **Mandour et al., (202٢)** who found that more than half of the sample has a first-degree positive family history of arthritis.

Regarding to had knee replacement surgery, it was observed that half of them had knee replacement, especially partial replacement among about one third of them reporting that the cause of surgery was due to an inability to carry out normal daily activities among most of the patients. From the researcher's perspectives this finding might be because Knee Replacement Surgery is generally accepted as a definitive treatment for advanced knee arthritis after a patient fails non-operative treatments.These results are in the same line with **Fawzy et al. (2020)** who reported that about three-quarters of patients under study were candidates to the TKR due to knee osteoarthritis.

As regards previous incidence of complications, the results of the present study revealed that there was previous incidence of complications post knee replacement surgery among half of them, with the most prevalent complication was incidence of inflammation at the

site of surgery among more than one third of them. This finding was in contrast with **Al-Otaibi, (2021)** who conducted a study about "Total knee replacement at Southwestern Saudi Arabia: A single-center experience" and reported that there was incidence of complications post knee replacement surgery The most common complications in our patients were superficial infection.

As regards to total mean of knowledge regarding knee replacement, the results of the present study revealed that there was highly statistically significant difference regarding to patients' total mean of knowledge throughout different study periods, in term of improvement in knowledge score at (p= <0.001). As Basic patients' knowledge regarding knee joints was of highest mean precent score of knowledge post 6 months followed by healthy practices of healthy balanced diet post knee replacement surgery in the majority of studied patients.

This finding was in an accordance with **Hashizaki et al. (2023)** who conducted a study about "Effectiveness of a 3-week rehabilitation program combining muscle strengthening and endurance exercises prior to total knee arthroplasty" and showed that after three months of program implementation, the fair knowledge level had improved from 63.3% post-surgery to 76.6% after one month. With p values of 0.001**, there was a very significant difference in knowledge level post-surgery, after two weeks, and after one and a half months between the study and control groups.

Concerning the total mean score of quality of life, the present study showed that there was a highly statistically significant difference regarding over all Qol in post nursing guidelines implementation compared with before. From the researcher's point of view, this indicate the effective of evidence nursing guidelines implementation that was given to the studied patient in improving their over all Qol.

This finding was in the same line with **Dong et al., (2023)** who conducted a study about "Evidence-based nursing reduces complications and negative emotions and improves limb function in patients undergoing hip arthroplasty" and showed well relieved negative emotions in both groups after nursing intervention.

As regards to relation between patients' personal data and their total mean score of knowledge throughout study phases of nursing guidelines implementation, The present study showed that there was statistically significant relation between total patients' knowledge and their personal data at pre nursing guideline implementation as age at (P= < 0.001). This result was inconsistent with **Abdelall et al., (2024)** demonstrates that the patients' age and the total score of knowledge about total knee replacement had a statistically significant difference and negative connection (r= -.390 P= 0.033). Furthermore, two weeks following the operation, there was a statistically significant positive association (r=0388) between the patients' occupation and their overall knowledge score about total knee replacement and their age.

According to the relation between patients' personal data and their total quality of life mean score throughout study phases of nursing guidelines implementation, the present study illustrated that there was statistically significant relation between total patients' quality of life at pre nursing implementation with their personal data as educational level and occupation at (P= < 0.001). While there was no statistically significant relation with age, gender, marital status and residence at (P= > 0.05). These findings disagreed with **Mandour et al., (202٢)** who clarified that there was only a significant relation between floor number and levels of quality of life.

In addition, the results revealed that there was a highly significant relation with educational level in the post 6 months. Also, there was a statistically significant relation with educational level and occupation post 3 months at (P= < 0.05). While there was no statistically significant relation with age, gender, marital status and residence post 3 and 6 months and finally with occupation post 6 months post-implementation nursing guidelines at (P > 0.05). this result was in disagreement with the study **Dennis, et al., (2023)** who conducted a study about "post-operative patient-related risk factors for chronic pain after total knee replacement" and reported that there was no relation between levels of quality of life and socio-demographic characteristics of patients with total knee replacement.

Regarding relation between patients' medical health history and their total mean score of quality of life throughout study phases of nursing guidelines implementation, the current study revealed that there was statistically significant relation between total patients' quality of life at pre nursing implementation and their medical history as time since diagnosis with knee arthritis at (P= < 0.001). In addition, the results revealed that there was no statistically significant relation with time since diagnosis with knee arthritis, presence of

family history with knee arthritis, having knee replacement and previous incidence of complications post knee replacement surgery post-implementation nursing guidelines at (P > 0.05).

This finding was in the same line with **Sveinsdóttir et al., (2021)** who found a significant association between higher mean scores of quality of life and medical history of patients during different period of the study.

Pertaining to correlation between total patients' knowledge and total quality of life scores among the studied patients at pre and post periods nursing guidelines implementation, This present study mentioned that there was a negative and significant correlation between total patients' knowledge and total quality of life score pre and post months periods of guidelines implementation with p-value (0.004*, 0.039*, & 0.007*, respectively).

These results in the same line with **Huang et al. (2021)** who conduct a study entitled "Exploring the relationship between knowledge and quality of life in participants with medial knee osteoarthritis: a cross-sectional study" and reported a negative relationship between knowledge and quality of life.

**Conclusions**

**According to the findings of this study, it concluded that:** there was a marked improvement in knowledge and all subscales of quality of life about physical, psychological and social status among studied patients post implementation of nursing guidelines. There were statistically negative correlations between total knowledge and total quality of life for the patients with knee replacement surgery at ($p \leq 0.05$). Moreover, the study finding supported the research hypothesis.

**Recommendations**

**In the light of the findings of the current research, the following recommendations are suggested:**

- Continuous development and updating of nursing guidelines for post-knee replacement care with a strong emphasis on patient education and early rehabilitation.
- Regular follow- up for patient with KR to ensure effectiveness of surgery, avoiding complication and revision of KR.
- Encouraging further research on the correlation between nursing interventions and patient quality of life after knee replacement surgery to ensure the provision of high-quality, evidence-based care.
- Further study should be conducted on larger sample size to assess quality of life among patients.

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