Effect of Nursing Instructions on Total Knee Replacement Patient's Knowledge

Shalabia Elsayed Abozead[1], Soad M.Sayed[2], Mohamed M .Abd-Alhameid[3],
Hanan A. Abd El-all[4]

[1]Professor of Medical-Surgical Nursing, Faculty of Nursing, Assiut University.

[2]Master of Medical- Surgical Nursing, Faculty of Nursing, Assiut University Hospital.

[3]Professor of Orthopedic and Traumatology Surgery, Faculty of Medicine, Assiut University.

[4]Assistant professor of Medical-Surgical Nursing, Faculty of Nursing, Assiut University.

Abstract: **Patient knowledge decreases anxiety and increases the patient's ability to assist with postoperative care procedures .Aim of the study: To evaluate the effect of nursing instructions on total knee replacement patient's knowledge. Research design: A quasi-experimental study design was utilized setting: the study was conducted in the department of Orthopedic Surgery at Assiut University hospital. Sample: A total number (60) adult patient undergoing total knee replacement divided into study and control group. Tools: Demographic, medical data and assessment of patient's knowledge about total knee replacement. Results: there is a statistically significance difference between the study and control groups during hospitalization, after (2,6)month, but there is no significant difference found after three weeks and after 4 months with p. value (0.500 and 0.105 respectively. Conclusion: Studied patient's knowledge improved after application of nursing instructions for patient with total knee replacement. Recommendation The patients should be provided with effective and satisfactory knowledge through regular educational programs about total knee replacement surgery.**

Keywords: **Patients knowledge, nursing instructions, Total knee replacement.**

1. INTRODUCTION

Knee replacement**:** is a common orthopedic surgery that involves replacing the articular surfaces (femoral condyles and tibial plateau) of the knee joint with smooth metal and highly cross-linked polyethylene plastic. During the procedure, the articular surface of the joint may be replaced, remodeled, or realigned using a number of different procedures. The goal of treatment is to improve joint stiffness or mobility and relieve pain **Evans et al., (2019).** Total Knee replacement (TKR) is a successful treatment for the rapidly increasing population of patients suffering from end stage of osteoarthritis **Parkinson, et al., (2017)** & **Kaur, et al., (2018) .**

knee replacements are the most commonly performed joint replacements, **Abrecht , et al., (2017)**.The goals of perform (TKR) are to improve patient quality of life, relieve pain, restore joint function, and ensure the ability to perform knee flexion activities that improve mobility and independence in patients who suffer from osteoarthritis **Al-Rumaih, (2017)** .

The knowledge and understanding of the causes and biological aspects concerning the knee replacement therapy are important factors for improving the pain and physical activity **Traumer, et al., (2018) Hofmann , et al., (2020)** .

Nurse has an important role assessment the level of knowledge regarding total knee replacement include knowledge assessment, physical activity and expected outcome to identify the needs of patients and improve their expectations regarding surgery's outcome **Souza , et al., (2020)**. Nurses identify patient's knowledge before surgery to promote patients' recovery, reduce patients' length of stay, and eased their financial burden. And due to most patients were elderly people, they were lack of knowledge about disease, and worried about the postoperative recovery, as well as engender to anxiety,

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fear. Nurses should explain about postoperative recovery, and give patient social and family support **De- Achaval, et al., (2016)**.

Nursing instructions for patient undergoing total knee replacement includes the following ; explain necessary postoperative activity restrictions. Teach the patient undergoing TKR how to use the overhead trapeze used for changing positions, the with patient who learns and practices moving techniques before surgery can use them more effectively in the postoperative period. Provide or reinforce teaching of postoperative exercises specific to the joint on which surgery is to be performed. Exercises are prescribed postoperatively to (a) strengthen muscles, providing joint stability and support, (b) prevent muscle atrophy and joint contractures; and (c) prevent venous stasis and possible thromboembolism **Deyle et al., (2020).**

The professional nurse notifying the patient with TKR to used check wound for signs of infection, severe swelling and redness and drainage that has a bad odor. Sutures (stitches) or staples was removed about 21days after surgery. Do not shower until 3-4 days after surgery, When can shower, let water run. Over incision but do not scrub it or let the water beat down on it. Do not soak in a bathtub, hot tub, or swimming pool. A bruising around wound is normal, and it will go away on its own and the skin around incision may be a little red, this is normal too **Veronese et al., (2018).**

The professional nurses notifying the TKR patient that at least the first 3 months about the following recommendation; sit on chairs that have arms. Using low chairs, low, or reclining chairs may be more difficult initially. The physiotherapist shows how the get in and out of a chair keeping the operated leg out in front of. But crossing the legs and kneeling is not recommended following the surgery **Doig, et al., (2019)**

Teach respiratory hygiene procedures such as the use of incentive stools spirometer, coughing, and deep breathing. Adequate respiratory hygiene is imperative for patient undergoing knee joint replacement to prevent respiratory complications associated immobility and the effects of anesthesia. Also deep breathing exercises promote hyperventilate of the alveoli and prevent them from collapsing again, in "move lung expansion and volume, help to expel anesthetic gases and mucus **Shaw and Shaw (2015).**

Significance of the study:

From the researcher's experience, it was found that patient undergoing (TKR) procedure continues to increase in admission rate to the Orthopedic department with great impact on hospital cost, in addition to (TKR) patients suffer from lake of knowledge needed to maintain knee function in post operation & after hospital discharge . So these nursing instructions designed to help such group of patients to provide them with more important and useful information to adapt to this procedure

Aim of the study: To evaluate the effect of nursing instructions on total knee replacement patient's knowledge.

Research hypothesis:

To fulfill the aim of the study the research hypothesis was formulated:-

The knowledge of the study group patients after nursing instructions higher than the control group.

2. PATIENTS AND METHOD

Research design:

Quasi experimental research design was utilized to conduct this study. (Study and control group).

Experimental and quasi-experimental research designs examine whether there is a causal

Quasi-experimental designs recognize a comparison group that is as similar as possible to the treatment group in terms of baseline (pre-intervention) characteristics. The comparison group captures what would have been the outcomes if the programme/policy had not been implemented (i.e., the counterfactual). Hence, the programme or policy can be said to have produced any difference in outcomes between the treatment and comparison groups

Setting:

This study was conducted in the department of Orthopedic Surgery and Outpatient Orthopedic Clinic at Assiut University Hospital.

Patients:

A total number of (60) adult patient undergoing total knee replacements are included the following criteria; age between 20-65 years, both male and female and agree to participate in this study. The study sample divided in to two groups (study and control) (30 patients for each) were choose randomize.

Randomization technique:

After the patient admitted to the Orthopedic department the first weak were assigned for a study group and patient admitted to department at the second weak were assigned for a control group and so for every weeks. The study group received exercise program, while the control group receive routine hospital.

Sample size: wear calculated by using the epi-info program with confidence level at 95% and the flow rate of patients 160 cases in 6 months so the sample was calculated to be 60 patients taking by randomized methods according to the admission date to the orthopedic department.

Tool:

Two tools in the study were utilized for data collection includes the following:

Tool (I): Structured interview questionnaire: it was developed by the researcher based on the literature review **Thomas (2017), Adie et al., (2019)and Evans et al., (2019)** to assessment patient's personal data , past medical history and patient's knowledge it included two parts

 Part (1): Demographic and medical data assessment

A: Demographic data assessment: as age, gender, occupation and level of education.

B: Medical data assessment: it included (associated chronic illness such as diabetic mellitus, hypertension, renal disease and liver disease).

Part (2): Assessment of patient's knowledge about total knee replacement it contain 11(items) as definition of total knee replacement, if receiving any instructions about total knee replacement, function of knee joint, indication, complications after TKR, assessment of knowledge about exercises as importance, types of knee exercises….etc.

Scoring system as the following: Total knowledge score were 31 degree it classify according to the following level score; good knowledge level was set between (21-31), fair level (16<21), poor knowledge if the score below (<16) **Oktas,   & Vergili,   (2018)**

Face validity and reliability to the study tools:

The face validity of study tools were checked by 5 expert professors in field of nursing and medicine, they reviewed the instruments for clarification, significance, comprehensiveness, comprehension, applicability and ease of administrative minor changes that needed correction were carried out accordingly, tools reliability refers to the degree of consistency with which the instrument measures the thing supposed to be measuring. Reliability of tools was confirmed by Alpha Cranach test (0.95).

Pilot study:

The purpose of this pilot study was of 2 folds: first to ensure the clarity of designated study tools. Second, to examine the utility of the designed tools and identity any difficulties or problems needed to be handled before applying it a pilot study carried out in November (2018) and last for one month in 10% of the study sample (6 patients) the patients involved in the pilot study were included in the study to the actual study sample because no modification of data collection tools was done.

 Method:

1. An official permission was obtained from the head of Orthopedic Surgery department at Assiut University Hospital.

2. Patient's agreement for voluntary participation was obtained after the purpose and nature of the study were explained.

3. Content validity was being checked by expertise from medical and nursing staff.

4. A pilot study was being conducted on 10% of patients to evaluate the applicability and clarity of the developed tools it included in the sample.

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5. The reliability of tools tested by test and retest according to pilot study.

6. Researcher was interviewed the patients to collect the necessary data (post-operative, after 3 weeks by interview for study and control patients and follow up after 2, 4 and 6 months in the Outpatient clinic.

7. For the study group the researcher explains to the patient the Nursing instruction in three sessions ,the duration of each session was around 20- 30 minutes. At the beginning of first session; patients were oriented regarding the guidelines contents, its purpose and its impact on their health condition. By the end of the first session, patients were informed about the time of the next one.

Each of the following   sessions were usually started by briefing about what was discussed in the previous session using simple Arabic language.

Each session ends by summary to its content and a feedback from the patients was elicited to ensure maximized educational benefits. After implementation of the nursing instruction   , reassessment of the patients knowledge immediately post program application, Also to   compared with assessment after 3 weeks, and (2,4 and 6) months in study group.

The participating group patients, study group were interviewed three times; the first interview was done post- operative during hospitalization, the second was after three weeks day after the exercise program and the third interview after 2 month then follow up by telephone and control group to be compared to the study group.

Session 1: Explain to the patient simplified data about the anatomy of the knee, knee joint function, definition of knee replacement, indication, complications and importance of exercises by handout and questioner about patient's knowledge.

Session 2: Notify importance of exercise, demonstrations of the following exercise (ankle pump exercise, getting out of bed and into bed, sitting in a chair, and rising from a chair and walk by walker and crutches.

Session 3: Demonstration of quad sets, hamstring set and straight leg raises exercise technique. hip /knee flexion (bending), knee extension over roll sideway lifts forward lifts, sitting knee flexion and quarter squats exercise technique. Climbing stairs going up, going down ,car transverse and information about discharge instruction for knee replacement surgery ….. ..etc.

• Each patient received a copy of the nursing instruction guidelines .

•   The researcher met separately with each patient, the study and its goals were explained to the patient.

•   After receiving the nursing instruction guidelines, patients were examined and at 3 weak, (2, 4 and 6 months) after receiving the instruction booklet during the follow-up period, patients were conducted by the researchers via telephone and in the Orthopedic clinic to ensure that they follow the instructions and address any questions that may arise.

Ethical considerations:

• Research proposal was approved from ethical committee in the faculty of nursing.

•   There was no risk for study subject during application of the research.

•   The study was following common ethical- principles in clinical research.

•   Informed consent was obtained from the patients who are willing to participate in the study after explaining the nature and purpose of the study.

•   Confidentiality and anonymity were assured.

•   Patient had the right to refuse to participate and or withdraw from the study without any rational any time.

• Patient privacy was considered during collection of data.

Statistical design:

Data was collected &analyzed by computer programmed SPSS. Using necessary statistical manipulation as; number, percentage, mean& standard deviation to determine significant for variables-value was considered to be significant if less than 0.05, high significant if less than 0.01, or insignificant if more than 0.05.

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3. RESULTS

Table (1): This table shows that the majority of the patients in both study and control groups are females (48.3 %), (40%) with age group ranged from (50 - ≥ 65yers) by percent of (50 %, 45 %) years respectively. As regarding to the educational level the majorities of the patients in the study are university education (23.3%) but are illiterate in the control group (16.7%).

Concerning to the occupation above half of the both group are retired (38.3%), (30%). As regarding to past medical history the two third of the sample in the study (33.3%) and half of control group (25 %) are hypertension.

Moreover; there is no statistical significant difference between study and control groups regarding demographic characteristics except in gender and occupation

Table (2): Reveals that there is a statistically significance difference between the study and control groups during hospitalization, after (2,6)month, but there is no significant difference found after three weeks and after 4 months with p. value (0.500 and 0.105 respectively).generally the there is a statistically significance difference between the study and control groups regarding total knowledge scores.

Figure (1): Reveals that there is a significant improvement of the study group patients' total knowledge level after the application of the exercise program and the percentage of good level among the study group increased after the 6 months of exercise program application.

Table (1): Baseline demographic characteristics of study vs. control groups among patient undergoing total knee replacement (n=60).

Variables	Study group N=30		Control group N=30		Significance
Age	n	%	n	%	
20- >35year	0	0.0	1	1.7	
35- > 50years	0	0.0	2	3.3	0.206 ns
50- ≥ 65	30	50.0	27	45.0	
Gender					
Male	1	1.7	6	10.0	0.051*
Female	29	48.3	24	40.0	
Occupation					
Work	2	3.3	1	1.7	
Routine work	1	1.7	11	18.3	0.004 **
Manual work	4	6.7	0	0.0	
Retired	23	38.3	18	30.0	
Education level					
Illiterate	8	13.3	10	16.7	
Read and write	1	1.7	4	6.7	0.253 ns
Primary school	1	1.7	3	5.0	
Secondary school	6	10.0	6	10.0	
University	14	23.3	7	11.7	
Past medical history					
Diabetes Mellitus	6	10.0	11	18.3	0.126 ns
Hypertension	20	33.3	15	25	0.211 ns
Renal disease	2	3.3	2	3.3	0.694
Liver disease	2	3.3	2	3.3	0.500 ns

Chi-Square Tests non significance p>0.0   Significance *p<0.05   highly significance *p≤0.01**

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Table 2: Comparison between total patients knowledge as regarding to total knee replacement among study and control group (n=60)

Variables	Follow up							
	Total knowledge total score 7-31							
		Good (21-31)		Fair (16-<21)		Poor(<16)		p.v
		n	%	N	%	n	%	
During hospital	Study group	21	70.0	7	23.3	2	6.7	0.001**
	Control group	13	43.3	1	3.3	16	53.3	
After threeweeks	Study group	25	83.3	0	0.0	5	16.7	0.500 ns
	Control group	26	86.7	0	0.0	4	13.3	
After 2 month	Study group	27	90.0	0	0.0	3	10.0	0.001**
	Control group	15	50.0	0	0.0	15	50.0	
After 4 months	Study group	21	70.0	0	0.0	9	30.0	0.105 ns
	Control group	26	86.7	0	0.0	4	13.3	
After 6 months	Study group	28	93.3	0	0.0	2	6.7	0.001**
	Control group	15	50.0	0	0.0	15	50.0	
Total knowledge	Study group	24	80.0	1	3.3	5	16.7	0.001**
	Control group	19	63.3	0	0.0	11	36.7	

Chi-Square Tests non significance p>0.0   Significance *p<0.05**   highly significance *p≤0.01
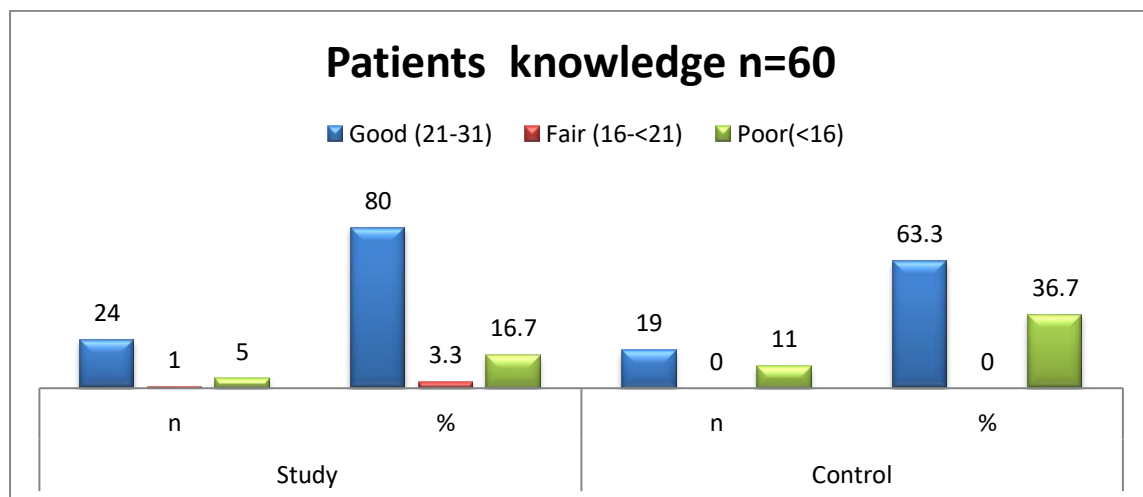

Figure (1): Total patient knowledge level among study and control group as regarding total knee replacement (n=60).

4. DISCUSSION

The orthopedic nurse should be assess the patient's knowledge and understanding of the planned operative procedure. Provide further explanations and clarification as needed. It is important that the patient have a clear and realistic understanding of the surgical procedure and expected results, knowledge decreases anxiety and increases the patient's ability to assist with postoperative care procedures. And obtain a nursing history and physical assessment, including range of motion of the affected joints providing enough information for the patient also increased their sense of responsibility to have a successful surgery and promoted their belief that they can adapt to and cope with the surgery. **Bernstein et al., (2018).**

As regards age of the study samples; the present study demonstrates that the majority of both groups their ' ages ranged from 50 to less than 65 years old. The study result concurs with **Goh, et al., (2017) and Tew, et al., (2020)** they have recorded that TKR procedure in mostly patients younger than 60 years of age.

The present study demonstrate that the majority of the study samples in both groups were females ,this agree with **Peyron ,et al.,(2016)** who verified that the prevalence of TKR is greater for women than for men.

As regards occupation of the study samples; the present study demonstrates that the majority of both groups their retired because ages ranged from 50 to less than 65 years old this agree with **Marker ,et al.,(2019)** they have recorded that TKR procedure in mostly patients are retired.

Regarding to patients medical history of chronic diseases; the present study found that around two third of the study group and half control group suffered from hypertension. This agrees with **Akamo, et al., (2017)** they added that chronic diseases as hypertension was widely recognized have been proposed to contribute to the development of osteoarthritis. It has been theorized that hypertension might affect osteoarthritis via narrowing of blood vessels and ischemia, which would initiate cartilage degradation that lead to the need to TKR procedure. And in the same line with the study by **Veronese, et al., (2018)** who demonstrated that higher prevalence of hypertension in patient undergoing to TKR.

The present study revealed that there was a statistically significance difference between the study and control groups regarding total knowledge scores. The results also revealed that there was a significant improvement of the study group patients' total knowledge level and the percentage of good knowledge level among the study group increased after the 6 months of the program application. This match with **Abreu et al., (2018)** who founded that the educational program for patients undergoing TKR includes set of planned educational activities organized to provide the patients knowledge and increased competence necessary to minimize complication after knee replacement and improved daily activity.

From the researchers' point of view; nursing guidelines must be tailored to the patients based on knowledge and health needs, many patient education sessions may be required to facilitate adequate knowledge gains; for example definition of knee replacement, indication, complications and importance of exercises participation in exercise therapy for TKR patient.

5. CONCLUSION

Improvement in patients knowledge level post application of teaching protocol for studied group more than the control group.

6. RECOMMENDATION

⊠ The patients should be provided with effective and satisfactory knowledge through regular educational programs about total knee replacement surgery.

⊠ Replication of the study on a larger probability sample acquired from different geographical areas in Egypt to figure out the main aspects of this problems.

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