

Assessment of Nurses' Knowledge Regarding Pre and Postoperative Care of Patients with Total Knee Arthroplasty

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Abstract

Background: Total knee arthroplasty (TKA) is one of the most clinically successful and cost-effective medical procedures developed during the last ½ century, and usually used to treat chronic refractory knee pain and loss of movement because of various underlying knee problems, **Aim of the study:** Assess nurses' knowledge regarding pre and postoperative care of patient with total knee arthroplasty, **Research Design:** A descriptive research design was used in the study. **Setting:** The present study was carried out at orthopedic departments affiliated to the Suez Canal University Hospitals, **Sample:** All available staff nurses (80 nurses) were included in the study, **Tools of data collection:** The data was collected by a tool named; self-administered questionnaire to obtain nurses profile data and assess nurses' knowledge regarding pre and postoperative care of patient with total knee arthroplasty, **Results:** Results revealed that 91.2% of nurses had an unsatisfactory level of total knowledge regarding care of patients with TKA, **Conclusion:** Based on the results of the current study, the majority of the studied nurses had unsatisfactory level of knowledge regarding pre and postoperative care of patient with TKA, **Recommendations:** Educational guidelines about standardized protocol of pre and postoperative nursing care of patients with total knee arthroplasty should be conducted. Repeat the study on other orthopaedic procedures to obtain more data and findings that will enhance the quality of nursing care in orthopaedic units. Further researches should be done using a larger sample drawn from other Egyptian regions in order to generalize the results.

Key words: Knee Arthroplasty. Nurses' knowledge. Pre and postoperative care.

1. Introduction

Total knee arthroplasty is one of the medical treatments that has been progressed in the last 150 years that is both clinically and financially successful (*Healy et al., 2013*). Total knee arthroplasty surgery is frequently used to treat musculoskeletal problems in individuals. Unsterilized fractures, congenital deformities, joint

disease, necrotic or infected tissue, and tumours are among the conditions that can be treated surgically. Also severe joint pain and disability often require joint replacement, and conditions that contribute to joint degeneration include osteoarthritis, rheumatoid arthritis, trauma, and congenital deformities (*Marcus & Esiashvili, 2014*).

Total knee arthroplasty involves the

replacement of cartilage with an artificial surface. The knee is not replaced; instead, a metal alloy is put on the ends of the femur and tibia and a piece of medical-grade plastic is inserted in the space between them to act as an artificial substitute for cartilage. Plastic can also be used to replace the cartilage inside the kneecap (*Enab & Bondok, 2013*).

Indications for total knee arthroplasty are based on the patient's age, underlying orthopedic condition, and general physical health and the impact of joint disability on daily activities. Timing of these procedures is important to ensure maximum function. In general, surgery should be performed before surrounding muscles become contracted and atrophied and serious structural abnormalities occur (*Khan et al., 2021*).

Continuous examination of the patient's cardiovascular, respiratory, renal, and hepatic systems is a key component of preoperative assessment and nursing care, which aims to support the patient's best possible health at the time of surgery. Also, it's crucial to check the neurovascular health of the extremity having joint replacement, as well as preoperative leg edema, a history of venous thromboembolism, and varicose veins that raise the risk of deep venous thrombosis (DVT) and pulmonary embolism after

surgery. In order to detect changes and impairments, postoperative evaluation results are finally compared with preoperative assessment data (*Olotu et al., 2019*).

From the moment a patient is scheduled for surgery, nurses play a crucial role in their care, assisting them through the pre-admission process and educating them on what to expect during their hospital stay and recovery process (*Puliti, 2012*). This helps patients recover quickly and safely by managing pain, starting mobilization, and adhering to guidelines for avoiding postoperative complications (*Parker et al., 2011*).

1.2 Significance of the study:

Total knee arthroplasty involves more ambulatory operations than ever before, many of which are novel to nursing and other healthcare professionals. As a result, it is necessary to evaluate the level of nurses' knowledge regarding pre and postoperative care of patients with TKA and to identify the degree of deficiency that certainly affects patient prognosis and outcomes in order to guide nursing authorities in developing future nurse training and education programs. The study also highlights the health issues and post-operative consequences that are reflected in declining death and morbidity rates.

Preoperative assessment and nursing care are aimed to promote patient's optimal health at the time of surgery through continues evaluation of cardiovascular, respiratory, renal, and hepatic functions. Patients experience a wide range of physical health problems following TKA including; pain, limited functional mobility, fatigue, leg edema, sleeping disorders and problems with appetite and bowel function, Knowing long-term health problems are essential to facilitate resource planning, assessment, and early interventions to promote patient health. (Evans et al., 2019).

The aim of the study: Assess nurses' knowledge regarding pre and postoperative care of patient with total knee arthroplasty.

Research Question:

Are nurses have a satisfactory level of knowledge regarding pre and postoperative care of patients with total knee arthroplasty?

2. Subjects and Method

Study design: A descriptive research design was used in the study.

Study setting: The present study was carried out at orthopedic departments affiliated to the Suez Canal University

Hospital.

The sample of the study: All available staff nurses (80 nurses) who working at the previously mentioned setting.

Tools of data collection:

A Self-administered Questionnaire:

It was developed by the researcher based on recent relevant literature review and studies (William, 2021., Vera, 2019., Morrison, 2017., Sandstrom et al., 2014., Lippincott, 2012., and Smeltzer et al., 2010.). It was composed of two parts.

Part (1): Nurses profile, it was concerned with demographic and work related data of the studied nurses as age, level of education, years of experience outside the orthopedic departments, years of experience in orthopedic departments, and previous training program related to knee replacement patient care.

Part (2): It was concerned with assessing nurses' level of knowledge regarding pre and postoperative care of patient with total knee arthroplasty which include basic knowledge regarding TKA, preoperative care of patient with TKA, postoperative care when patient returns to inpatient ward, immediate and long term postoperative complications for patients with

TKA, follow-up instructions and long term plan for patients with TKA.

Scoring system:

The total score of nurses' knowledge of 50 questions was ranged from 0 to 50. The respondent was given zero for the incorrect answer, and one point for the correct answer. The total score less than 70% considered an unsatisfactory level of knowledge, and a total score of 70% or more considered a satisfactory level of knowledge (*Bakr Abo El-Ata et al., 2019*).

Validity of the study Tool:

Tool of data collection was already tested for its content validity. Comprehensiveness and applicability by 5 experts: one expert from the Medical Surgical Nursing Department at Faculty of Nursing in Port Said University, one expert from Medical Surgical Nursing Department at Faculty of Nursing in Suez Canal University and 3 experts from Orthopedic Surgery Department at faculty of medicine in Suez Canal University to determine whether the included items are comprehensive, understandable, applicable, clear and suitable to achieve the aim of the study.

Reliability of the study Tool:

Tool reliability was tested using a Cronbach alpha coefficient to assess the internal consistency of the tool and its value was (0.7).

Pilot study

Tools of data collection were tested on ten percent of subjects (8 nurses) and they were excluded of the entire sample of research study. The results of the data obtained from the pilot study helped to modify the tools: items were corrected and added as needed. Accordingly, modifications were done and the final form was developed.

Field work:

The researcher gave nurses who accepted to take part in the study a brief explanation of its goal. The actual fieldwork was done from the beginning of December 2021 to the end of May 2022.

Administrative design:

The director of the orthopaedic surgery departments gave official authority to gather data after receiving a formal letter from the dean of the nursing faculty at Suez Canal University. The study's objectives and anticipated results were explained to the

examined nurses.

Ethical considerations:

Written consent was taken from each nurse prior to participation in the study after simple explanation of the aim and the expected outcomes. The researcher assured voluntary participation, anonymity and confidentiality of the information.

Statistical design:

Upon the completion of data collection, the gathered data were organized and coded prior to computer entry. The data were imported into statistical package for social sciences (SPSS version 23) software for statistical analysis.

3- Results

Table (1): Shows that 43.8% of studied nurses' ages was between 25 to less than 30 years with mean age of 26.71 ± 4.26 , while 61.3% of studied nurses are female, and 57.5% of studied nurses had technical degree, also 51.3 of the studied nurses had less than 3 years of experience in orthopedic department. Moreover 97.5% of studied nurses did not attend courses regarding total knee arthroplasty patient care.

Table (2) Illustrates that mean score of

the total nurses' knowledge was (27.35 ± 5.29) out of 50. Also reveals that, 91.2% of studied nurses had unsatisfactory level of knowledge regarding pre and postoperative care of patient with total knee arthroplasty while only 8.8% of studied nurses had a satisfactory level of knowledge.

Table (3): Demonstrates that there was no statistical significant correlation between total scores of the studied nurses' knowledge and their profile data.

4. Discussion

Total knee arthroplasty (TKA) is thought to be the most frequent therapy for end-stage knee osteoarthritis (OA). This procedure also makes a lot of sense for a number of other underlying reasons, such as inflammatory arthritis, fracture (posttraumatic OA or deformity), dysplasia, and malignancy (*Ghosh & Chatterji, 2019*).

Regarding nurses profile data, the mean age of the most studied nurses was less than thirty years oldest, these result was in identical line with *Aldakheel, (2021)*, who assess nurses' knowledge concerning knee arthroplasty and illuminated that more than half of the studied nurses aged between (20-

29) years old.

On the same line, this result agreed with the study conducted by *El-Sayed et al. (2016)* about “Effect of nursing care standards for preventing deep vein thrombosis among patients undergoing hip surgery on nurses' performance and patients' outcome” and founded that about half of the studied nurses were in the age category >30 years old with mean age of (31.3667). This young age of present study may reflect the early graduation from technical institute as more than half of them graduated from the technical nursing institute.

Regarding educational level, more than half of the studied nurses had technical degree, but these result disagrees with *El Shemey & Elsaay (2015)*, who reported that most studied nurses in orthopedic department had a Baccalaureate degree in nursing education, also not agreed with *Taha & Ibrahim, (2021)*, which revealed that two thirds of studied nurses in orthopedic department had a secondary school nursing education.

Most of the studied nurses in orthopedic units had a technical degree and this may reflect that the most of Baccalaureate nurses are directed to the

critical areas in the hospital as ICUs and Operation Rooms, in addition to preference of Baccalaureate nurses to join critical areas to gain more knowledge and practices.

Concerning years of experience in orthopedic unit, more than two thirds of studied nurses ranged from (1-6) years of experience in orthopedic unit, these results was in line with *Aldakheel, (2021)*, that revealed that most of studied nurses had between (1 to 8) years of experience,

Moreover, those results concur with a study done by *Causey-Upton, (2020)*, to assess orthopaedic nurses' perceptions of preoperative education for total knee replacement, revealed that most of nurses working in the orthopedic departments ranged from (1-10) years of experience. The nurses of the present study had a decreased years of experience in orthopedic department and this may reflect increasing level of nurses' transmission between departments and increasing turnover rate, as well as the old nursing staff directed to the critical areas in the hospital.

The present study showed that most nurses had not attended previous training courses about TKA, this finding is supported by *Aldakheel, (2021)*, which revealed that

less than one quarter of studied nurses participated in the training courses related to knee replacement nursing care.

Concerning total score of nurses' knowledge regarding pre and postoperative care of patient with total knee arthroplasty, the majority of the studied nurses had unsatisfactory level of knowledge regarding pre and postoperative care of patient with total knee arthroplasty, those results were in the same line with *Aldakheel, (2021)*, who assess nurses' knowledge concerning knee arthroplasty which revealed that two thirds of nurses had unsatisfactory general knowledge regarding pre and postoperative care of patient with total knee arthroplasty

Moreover, the present results were in accordance with the study done by *Taha & Ibrahim, (2021)*, that entitled "Effect of Educational Program on Nurses' Knowledge, Practices and Patients' Outcomes Post Total Knee Arthroplasty" which showed that nearly about two thirds of studied nurses had unsatisfactory level of knowledge regarding pre and postoperative care of patient post total knee arthroplasty

Additionally, those results were in agreement with the study done by *Kiekkas et al, (2014)*, which showed that the nurses

have insufficient post-operative care knowledge and illustrating the need for pre-graduate and continuing education of nurses. Also these results were in agreement with the study done by *El Shemey & Elsaay, (2015)*, a study entitled "Efficacy of Implementing Nursing Care Protocol on Total Hip Replacement Patient's Outcome" which showed that the majority of nurses had unsatisfactory level of knowledge regarding immediate care after hip joint replacement.

So that in the current study most of nurses in orthopedic units had an unsatisfactory level of knowledge regarding pre and postoperative care of patient with total knee arthroplasty. A possible interpretation of those results may be due to standard protocol of nursing care related to TKA surgeries were not explained clearly in the curriculum, also may be due to lack of clinical education and continuous hospital training courses.

5. Conclusion:

In the light of the current study findings, it can be concluded that, the majority of the studied nurses had unsatisfactory level of knowledge regarding pre and postoperative care of patient with total knee arthroplasty.

6. Recommendations:

In the light of the finding of this study, the following recommendations are proposed:

1- Educational programs should be conducted regarding standardized protocol of pre and postoperative nursing care of patients with total knee arthroplasty.

2. Repeat the study on other orthopaedic procedures to obtain more data and findings that will enhance the quality of nursing care in orthopaedic units.

3- Further researches should be done using a larger sample drawn from other Egyptian regions in order to generalize the results.

Table (1): Percentage Distribution of the Studied Nurses According to their Profile Data.

Nurses Profile Data	Total Sample (N=80)	
	N	%
Age (Years)		
25 to <30	35	43.8
20 to <25	29	36.2
30 to <35	10	12.5
≥35	6	7.5
Mean ±SD	26.71±4.26	
Gender		
Female	49	61.3
Male	31	38.7
Education		
Technical Institute of Nursing, Suez Canal University	46	57.5
Suez Canal University Nursing School (5years)	20	25.0
Suez Canal University Nursing School (3years)	14	17.5
General experience (Orthopedic Department)		
<3 y	41	51.3
3 to <6 y	26	32.5
6 to <9 y	8	10.0
>9 y	5	6.2
Mean ±SD	3.38±3.32	

Cont., Table (1): Percentage Distribution of the Studied Nurses According to their Demographic Characteristics.

Nurses Profile Data	Total Sample (N=80)	
	N	%
General experience (out orthopedic unit)		
Mean ±SD	3.28±3.89	
Courses attendance of Total Knee Arthroplasty patient care		
No	78	97.5
Yes	2	2.5

Table (2): Mean Scores of Nurses' Knowledge Regarding Pre and Postoperative Care of Patient with Total Knee Arthroplasty (N=80).

Nurses Knowledge	Mean±SD
Knowledge regarding TKA	5.20±1.49
Knowledge regarding preoperative care for patient with TKA	5.78±1.35
Knowledge regarding postoperative care	5.80±2.25
Immediate and long term postoperative complications	5.36±1.48
Knowledge regarding the follow-up instructions and long term plan for patients with TKA	5.20±1.61
Mean±SD (50 items)	27.35±5.29

Table (3): Relation between Nurses Profile Data and Knowledge Level.

Nurses Profile Data	Knowledge level	X ² (P value)
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	Satisfactory		Unsatisfactory		
	N	%	N	%	
Age (Years)					
20:<25	4	13.8	25	86.2	1.46 (0.747)
25:<30	3	8.6	32	91.4	
30:<35	0	0	10	100	
≥35	0	0	6	100	
Gender					
Male	2	6.5	29	93.5	0.335 (0.563)
Female	5	10.2	44	89.8	
Education					
School 3y	0	0	14	100	1.30 (0.566)
School 5y	2	10	18	90	
Technical	5	10.9	41	89.1	
General experience (out orthopedic unit)					
<3y	6	14.6	35	85.4	2.39 (0.449)
3:<6	1	3.8	25	96.2	
6:<9	0	0	8	100	
>9y	0	0	5	100	
Experience (orthopedic unit)					
<3y	5	10	45	90	0.605 (1.000)
3:<6	2	10	17	90	
6:<9	0	0	4	100	
>9y	0	0	7	100	
Courses					
Yes	7	9	71	91	.aaa
No	0	0	2	100	

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