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ASSESSMENT OF POST-OPERATIVE PAIN MANAGEMENT AMONG PATIENTS UNDERGOING FOR TOTAL KNEE REPLACEMENT (TKR): A CROSS-SECTIONAL STUDY

Zahida Kussor[1], Capt. Professor Yasmeen Saggu[2], Shahla Arshad[3], Sardar Ali[4], Mahnoor Asghar Shinwari[5], Shireen Hayat[5], Natasha Khurshid[5], Shazia Naz[6], Amir Sultan[7]

[1]Nursing Faculty College of Nursing Armed Forces Post Graduate Medical Institute Rawalpindi

[2]Dean and Professor at Foundation University College of Nursing Islamabad

[3]Lecturer Institute of Nursing Sciences Khyber Medical University, Peshawar

[4]Assistant Professor Institute of Nursing Sciences Khyber Medical University, Peshawar

[5]Final Year MBBS, Northwest School of Medicine Hayatabad Peshawar

[6]Head Nurse, Instructor College of Nursing Layyah, Nursing Superintendent District Head Quarter Hospital Layyah

[7]Associate Professor and Head of Nursing Department, Times Institute Multan, Pakistan

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Corresponding Author:

Sardar Ali, Assistant Professor
Institute of Nursing Sciences
Khyber Medical University
Peshawar Pakistan, Email:
sardar.ins@kmu.edu.pk

ABSTRACT

Background: Osteoarthritis is a common and very devastating disease that affects one or both knees. The aim of the study was to assess the post-operative pain management of patients undergoing for TKR.

Methodology: The current study design was cross-sectional descriptive that was conducted in 5 private and public sector hospitals of Rawalpindi and Islamabad. The total sample size were 60 nurses who deal patients of TKR from 1st April to 5th July 2022 using universal sampling technique. A self-structured tool was used for data collection, while data where analyzed through SPSS 20. The aim and objectives of the study was explained to each participant while data was collected after informed consent.

Results: The findings revealed that majority of the patients 51 (56.7%) among 90 patients undergone for TKR were observed for pharmacological pain management in post-op period that received combined anesthesia through spinal and epidural. There were no pain assessment scale used for the assessment of pain during post-operative management and nor any nursing led pharmacological intervention were used observed in the study findings.

Conclusion: The study concluded on the basis of findings that it is necessary for nurses and orthopedic team that a standardized protocol in care should be used for the pain assessment during post-operative phase. The standard care will not only help in fast recovery but will also promote patient satisfaction, reduction of risk from infection and cost effective.

INTRODUCTION

Osteoarthritis (OA) of the knee is the commonest form of arthritis and estimated to be the fourth leading cause of disability worldwide (Fransen M, et al 2011 and Wylde, et al. 2007). In Pakistan 28% of the urban and 25% of the rural population are reported of having knee osteoarthritis (Iqbal. N, et al. 2011). Many non-surgical therapeutic interventions are being offered to people with chronic knee pain and osteoarthritis, such as medications, self-management programs and physiotherapy (Wylde, et al. 2007). Health and behavior modification including weight loss and patient education helps in delaying progression of disease. When these traditional treatments do not relieve pain, patients may be offered total knee replacement (TKR) (Wylde, et al 2007).

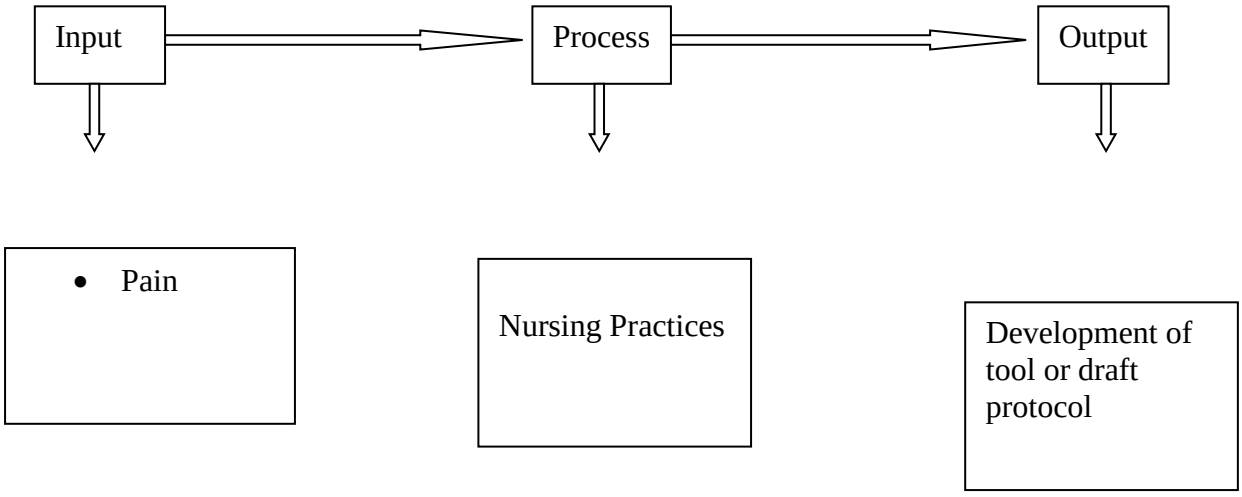
TKR is a surgical reconstruction procedure where the distal head of the femur and the proximal head of tibia are replaced by metal implants (Umer M, et al 2008). Total knee replacement is a current day practice of any Orthopedics unit (Sepah, et al 2011). Even though TKR is a highly expensive operation but it relieve the pain of patients (Symmons, et al. 2006). In addition to surgical expertise, success of these highly advanced surgical procedures is based on accurate and skillful nursing management in the post-operative period. Skilled postoperative nursing care helps to improve functional recovery and financial burden on the hospital. Most importantly good nursing care enhances patient satisfaction and adherence to treatment. There are many post-operative challenges among patients undergone TKR as pain being the most pre-dominant in immediate recovery and subsequent management (Mahoney et al 1990). Pain remains a poorly understood phenomenon and is often ignored and inadequately managed (Khan, T.H 2008). Pain has been accepted as fifth vital sign by WHO, therefore, pain assessment and management is more relevant to the phenomena under study. Pain is frequently aggravated by the ongoing physical therapy that is vital to the long-term outcome of the surgery. Quality of life in the post-operative period depends largely on adequate pain relief (Galloway et al 2011).The researcher has observed that patient with TKR hesitate to mobilize just because of pain. Quality of life in the post-operative period depends largely on adequate pain relief (Galloway et al 2011). Several techniques for postoperative pain management are available for patients undergone TKR. According to WHO pain ladder if pain occurs, there should be rapid administration of drugs, till the patient is free of pain. Additional drugs should be used to calm fears and anxiety. To keep the pain at minimum level, drugs have to be given by the clock that is each 3-6 hours, rather than on request. Pain control requires regular patient assessment postoperatively, at scheduled hours

(VHA/DoD). The nurses must assess the pain status of patient by using pain scale before administering pain medication and must use non-pharmacological nursing interventions along with medication to ease patients. Pain has been accepted as fifth vital sign by WHO therefore should be recorded, assessed and managed as regularly and routinely as other physiological parameters (Shannon. K., & Bucknall T 2003). Relief of pain is a basic human right and, hence, an ethical rather than purely clinical concern for health professionals (Cousins, 2004). Pain is one of many post-operative challenges among patients undergone TKR as being the most pre-dominant, in immediate recovery and subsequent management (Mahoney et al 1990). Unrelieved pain can adversely affect the surgical outcomes and may lead to chronic pain, with associated financial and societal costs (NHMRC, 1999). Pain remains a poorly understood phenomenon and is often ignored and inadequately managed (Khan, T.H 2008 and Manias & Bush, 1999). Although there are remarkable developments in analgesic techniques many patients still continue to experience severe pain. (Apfelbaum. J. L et al 2003 and Yates et al 2001). According to Pyati et al 2007 inadequqte analgesia is related to delay in post-operative recovery and prolonged hospital stay. It was found in a study conducted by Dolin1, S. J. et al (2002) that there are different ways of relieving post-operative pain in TKR patients such as in the past intramuscular (I.M) injections of opioids and more recently, the more effective methods of pain relieving are intravenous (i.v.) patient-controlled analgesia (PCA) and epidural analgesia . They also emphasized that the evaluation of pain after surgery is complex phenomenon and that the pain intensity is accurately represented by visual analogue scale. Singelyn, F. J. et al 1998 reported that postoperative pain was severe in 60% of patients and moderate in 30% and a major concern after TKR. Its inadequate treatment intensifies reflex responses, which can cause serious complications. Although postoperative pain after TKR can be relieved by a number of techniques, but the continuous 3-in-1 block and epidural analgesia provide better pain control than IV, PCA with morphine. They concluded that continuous 3-in-1block is the technique of choice for providing postoperative pain control in TKR patients. The study was conducted with the aim to observe and enlist the post-operative nursing measures adopted in management of pain in TKR patients.

Conceptual Framework

A framework of this study guides the development of the study and enables the researcher to link the findings to the body of the nursing knowledge.

Figure 1Conceptual Framework



Methodology

A descriptive cross-sectional study design was used to determine the post-operative pain management of TKR patients. It observes and enlists the post-operative nursing measures adopted in pain management of TKR patients. The study design explains the purpose of current study which is to develop a protocol of nursing practice for management of TKR patients. Therefore, this design suited best for the study purpose. The study was carried out at Rawalpindi and Islamabad, Pakistan while the data was collected from following five hospitals from both public and private sectors;

1. Shifa International Hospital Islamabad
2. Pakistan Institute of Medical Sciences (PIMS) Hospital Islamabad
3. Kalsoom International Hospital Islamabad
4. Combined Military Hospital (CMH) Rawalpindi.
5. Quaid-e- Azam International Hospital Rawalpindi.

To achieve the objectives, no fix sample size was planned rather universal sampling technique was used. A descriptive cross-sectional study was carried out from 1st April to 5th July 2022. All

patients undergoing TKR in this duration were included in the study. All nurses of both genders working in orthopedic units from 1st April to 5th July 2022 and are willing to participate in the study were included in the study while patient who are not willing to be voluntary participant are excluded from the study. A self-designed structured data capture sheet Proforma was used as a tool for the data collections. The tool consists of nurses and patient demographics and a variable as pain, which was observed by the researcher in the study setting areas. The tool was content validated by three experts. Data was collected by the principal investigator. The purpose of study was explained to the nurses who were managing the patients of TKR in the orthopedic units of the hospitals, for their regular observation in the study setting hospitals. A universal sampling method was used for this study. Once the voluntary written consent was obtained from the study participants they had been told that they would be observed by the researcher while providing care to TKR patients The data collection started in the 1st week of April 2022, and it continued till the 1st week of July 2022. 61 Nurses providing care to 90 TKR patients were observed in the study setting. All the analysis was done using the Statistical Package for Social Sciences (SPSS) version 22.0. Analysis was limited to descriptive statistics. The study was conducted as per recommendation of Helsinki Declaration. Ethical approval to conduct the study was obtained from Ethical Review Committee (ERC) of University of Health Sciences, Lahore. Ethical clearance was also obtained from Ethical Review Committee of Pakistan Institute of Medical Sciences. Institutional consent was taken from the responsible authority of Shifa International Hospital Islamabad, Pakistan Institute of Medical Sciences (PIMS) Hospital Islamabad, Kalsoom International Hospital Islamabad, Combined Military Hospital (CMH) Rawalpindi and Quaid-e-Azam International Hospital Rawalpindi. A voluntary written informed consent was taken from the participants in the language that the participant could understand and comprehend prior to the data collection.

Participation in this study was voluntary and there was no compensation given for participation in this study by the institute. However, to appreciate the participants' contribution in the study, a token of thanks was given to each participant. However, occasionally, during the data collection process, the nurses or participants' became reluctant that they were being observed. They were offered support and given the choice to discontinue. Moreover, they have an option to refuse to participate in the study. However, none of the participants opted to discontinue or refused to participate in the study.

Results

60 Nurses providing care to 90 TKR patients were observed in the study setting of which 53 (88.3%) were female and 7 (11.7%) were male with age ranging from 20 - 59 years. Majority of nurses 32 (53.3%) were in 20-29 years of age group. Among these participants 6 (10%) were with Bachelor of Science in nursing (BSN), 3 (5.0%) with post basic qualification and 3(5%) were with diploma in Teaching and Administration. Majority of Nurse 48 (80%) were having diploma in General Nursing (RN) and diploma in Midwifery Nursing. The work experience of the participants in Orthopedic Units where majority of participants n=39 (65%) were in the range of 0-2 years, n=15 (25%) were in the range of 3-4 years, n=6 (10.0%) were in the range of 5-6 years (see table 1).

Table 1: Demographic data of the participants

Domains	*Frequency (n-60)*	*Percentage*
Age		
20-29	32	53.3 %
30-39	24	40.0 %
40-49	2	3.3 %
50-59	2	3.3 %
Qualification		
BSN	6	10 %
RN, RM	48	80 %
ICU, OT	3	5 %
RN, RM, DWA, DTA	3	5 %
Experience		
0-2 years	39	65 %
3-4 years	15	25 %
5 and above	6	19 %

RN: registered nurse, RM: registered midwifery, OT: operation theatre, ICU: intensive care unit,

DWA: diploma in ward administration, DTA: diploma in teaching and administration. BSN: Bachelor of science in nursing.

Pharmacological management of TKR patients

The study finding on pain assessment showed that no pain scale was used for pain assessment during post operative management by study participants.

Among 90 patients who were observed for pharmacological pain management in post op period, 25(27.8%) had undergone TKR through spinal anesthesia, 11(12.2%) had undergone TKR through general anesthesia. Majority of patients 51(56.7%) had undergone TKR surgery through combine spinal and epidural anesthesia. The pharmacological pain management at zero postoperative day of TKR surgery. The study finding shows that among total patients' n=90, 42(46.7%) were given continuous epidural analgesia, where as narcotics were administered as per requirement. Among these 43(47.8%) were given intravenous inj Toradol Infusion + inj Nalbin QID as prescribed for post op management of TKR patients.

The pharmacological pain management on 1st postoperative day of TKR surgery. The study finding shows that among total patients' n=90, 42 (46.7%) were given Tab Codogesic QID, 43(47.8%) were given Intravenous Inj Nalbin QID, and only 5(5.6%) were given I/V Inj Felgan + Toradol with sos Inj Morphine as prescribed in post op management. The pharmacological pain management on 2nd postoperative day of TKR surgery. The study finding shows that among total patients' n=90, 33 (36.7%) were given Tab Codogesic QID, 38 (42.2%) received Intravenous Inj Nalbin QID as prescribed in post op management. Similarly findings were found on 3rd post-operative day the pharmacological pain management of TKR surgery. The study finding shows that among total patients' n=90, 30 (33.3%) were given Tab Codogesic QID, 42 (46.7%) were given Intravenous Inj Nalbin QID as prescribed in post op management. Results on non-pharmacological pain management of TKR surgery showed that non of the non pharmacological nursing interventions were used at all (see table 2).

Table 2: Pharmacological management of TKR patients

Domains	*Frequency*	*Percentage*
Types of anesthesia		

Spinal anesthesia	25	27.8%
General anesthesia	11	12.2%
Spinal and epidural anesthesia	51	56.7%
Epidural anesthesia	3	3.3%
Pain medication (Post-op day)		
Continuous epidural analgesia + narcotics (if required)	42	46.7%
IV inj: Toradol Infusion + inj: Nalbin QID	43	47.8 %
Inj: Toradol IV TID and SOS	3	3.32%
Inj: Felgan + Inj: Toradol with SOS morphine	2	2.22%
Pain medication (1st post-op day)		
Tab codogesic QID	42	46.7 %
Inj: Nalbin QID	43	47.8 %
Inj: Felgan + Inj toradol IV with SOS inj: Morphine	5	5.6 %
Pain medication (2nd post-op day)		
Tab codogesic QID	33	36.7%
Inj: Nalbin QID	38	36.7%
Inj: Paracetamol + Inj tramol TID	13	13.33%
Inj: Toradol IV TID and SOS	4	4.46%
Inj: Felgan + Inj toradol IV with SOS inj: Morphine	2	2.22%
Pain medication (3rd post-op day)		
Tab codogesic QID	33	33.3 %
Inj: Nalbin QID	46	46.6 %
Inj: Paracetamol + Inj tramol TID	13	13.33 %
Inj: Toradol IV TID and SOS	6	6.36 %
Inj: Felgan + Inj toradol IV with SOS inj: Morphine	2	2.22 %
SOS: As needed, TID: Three times a days, QID: four times a day, IV: intravenous, TAB: Tablet, Inj: Injection		

Discussions

Osteoarthritis (OA) of the knee is the commonest form of arthritis and the fourth leading cause of disability worldwide (Fransen M, et al 2011 and Wylde, et al. 2007). According to WHO, 2007 the worldwide prevalence of OA was found to be 143. 7 million in 2002. OA has affected about 8.5 million people in the United Kingdom and an estimated 26.9 million in the United States. Similarly in Pakistan 28% of the urban and 25% of the rural population reported of having knee osteoarthritis (Iqbal. N, et al. 2011 and Gibson T et al 1998). This study estimated that the most common cause (97.8 %) of TKR among the 90 patients in the study setting was OA, which is consistent with the results of studies conducted in developed and developing countries. This data is comparable to other reported studies in Pakistan, and other developing countries.

The success of TKR surgery is directly related to a well defined process or protocol during immediate and subsequent post operative management. Therefore nurses are expected to care these patients as per protocols. This study estimated that there is no nursing protocol for nurses for provision of standardized care of TKR patients

The findings of current study showed that nurses were not using any pain scale for pain assessment of patients. The study conducted by Ene, Nordberg, Bergh, Johansson, and Sjorstrom, in 2008 showed that as nurses are working in close proximity with the patients in post-operative units so have a significant professional role in post-operative pain management and that nurses usually did not use proper pain scale.

Dolin1 S. J. et al conducted a study in 2002 and was found that the evaluation of pain after surgery is complex phenomena and that the pain intensity was accurately represented by visual analogue scale. Coyne et al. (1999) indicated that one of the main factor influencing nurses' pain management practices might be the different educational backgrounds of nurses. As the results of current study showed that most of nurses were diploma holders and were not undergone any formal training for pain management.

There are different ways of relieving post operative pain in TKR patients such as the intramuscular injections of opioids and intravenous (i.v.) patient-controlled analgesia (PCA) and epidural analgesia. The current study also shows that the patients who received combined spinal and epidural anesthesia and continuous epidural analgesia for zero post op days need less analgesia postoperatively and they have fewer difficulties in post op mobility. This study also indicates that better pain control in the early post op period improves; post op mobilization fast

recovery, patient satisfaction level, it also reduces cost, length of hospital stay and risk of infection. Singelyn, F. J. et al 1998 reported that although postoperative pain after TKR can be relieved by a number of techniques, but the continuous epidural analgesia provide better pain control than IV, PCA with morphine. They concluded that continuous epidural analgesia is the technique of choice for providing postoperative pain control in TKR patients. According to Crowley and Fischer (2006) there are two main benefits of regional anaesthesia: Firstly it reduces the need of additional post surgery analgesia in comparison to general anaesthesia secondly it increases the acute phase rehabilitation as well as the outcome of the total knee replacement.

Pharmacological intervention alone may not be sufficient in addition, non pharmacological interventions for relief of post op pain are necessary. Results on non pharmacological pain management of TKR surgery showed that nurses are not using any of non pharmacological interventions for relief of post op pain during first four post operative days of TKR surgery. Alam, Waliwllah and Shamsuddin's study (2008) and (Twycross, 2006) found that the use of analgesics alone in relieving pain during the post-operative period is ineffective and they recommended the combination of pharmacological and non pharmacological measures for pain management.

Conclusion

To summarize the findings of the present study, it was observed in that not any standardized nursing protocol exist in any of institution in which the study was conducted. The ongoing care was based only on orthopedic surgeon orders it suggests that there is a dire need of surgical protocol for the post op management of TKR. This highlights the need for greater attention to be paid to the surgical health and well-being of patients. Appropriate interventions are required on an urgent basis to equip the nurses with knowledge of orthopedic care / training. To develop a draft protocol there is a need to establish a team of orthopedic surgeons and nurses of different hospitals to develop a standardized protocol for TKR patients. This study also indicates that better pain control in the early post op period improves; post op mobilization fast recovery, patient satisfaction level, it also reduces cost, length of hospital stay and risk of infection.

Recommendations :

- The hospitals should develop TKR protocols & Organize in-service lectures and sessions
- There is a need to conduct the study country wide and to explore other aspects of post op management TKR patients which may contribute to the development of protocal so as to plan health facilities.

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