

## The Effect of Postoperative Pain Assessment and Management Monitoring Program on Surgical Nurses' Documentation, Knowledge, Attitudes, and Patients' Satisfaction at Mansoura University Hospitals

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**Abstract: Introduction:** Post operative pain is an expected adverse outcome following surgery and it often delays mobilization and overall recovery. Acute post operative pain is subjective and cannot be measured objectively.

**Aims:** The aim of this study was to: 1- Assess nurses' postoperative pain assessment and management documentation of pain in the first three days postoperatively in the surgical wards at Mansoura University Hospitals. 2-Assess nurses' knowledge of and attitudes toward pain in the surgical wards at Mansoura University Hospitals. 3-Assess nurses' communication with patients and their satisfaction of pain management, and 4-Evaluate the effectiveness of implementing a postoperative pain assessment and management program (POPAM) on improving nurses' documentation, knowledge, attitudes, communication with the patients and their satisfaction of pain management. **Materials and Method:** The POPAM program was implemented for six months from 10 November 2010 to 10 April 2011. Data were collected by interviewing 18 nurses working in surgical wards at Mansoura University Hospitals. The program was evaluated by means of a quasi-experimental pre-post test design. Documentation of pain in the first three days postoperatively in the patients' records were audited, nurses' knowledge of and their attitudes toward pain, and, assessment of nurses' communication about pain with patients and their satisfaction about nurses' intervention were assessed before and after implementing the program. **Results:** The findings illustrated that the implementation of an educational program for nurses was successful. First of all, the patients' records showed a significant difference in the amount and the quality of nursing documentation which reflected the fact that nurses became more aware about the importance of documentation and might also means that they change their practices toward better postoperative pain management. Secondly, the nurses developed the habit of assessing postoperative pain intensity using numeric rating scales, in addition to the assessment of other pain characteristics. Thirdly, the nurses improved their knowledge about postoperative pain, and their attitudes toward it were evidently changed. Finally, the quality of communication with patients about pain and pain management was significantly improved. **Conclusions and Recommendations:** The study concluded that nurses in Mansoura University Hospitals which included in this study possess moderate knowledge and positive attitude towards post operative management. Continuous education in pain management is crucial to improve nurses' knowledge and attitude towards post operative management. The results of this study provided a framework for the development and implementation of continuing education programs for nursing staff which can enhance the quality of patient care in post operative pain management. Therefore, it is imperative that pain assessment should be included as the fifth cardinal vital signs in the nursing curriculum. Another implication related to nursing management is that this study might increase the awareness of the health care professionals and the health institutions administration toward the establishment of team work to induce change with a common purpose in upgrading the quality of pain assessment and management. Managers and supervisors can facilitate the application of educational programs and incorporate with the team to move more quickly in the desired change. Implications of the study may be relevant to nursing education and in continuing education of health care institutions.

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### 1. Introduction

Post operative pain is an expected adverse outcome following surgery and it often delays mobilization and overall recovery<sup>(1)</sup>. Moderate to severe post operative pain is unpleasant but treatable. Adequate level of knowledge and positive attitude

are essential components in the delivery of post operative pain management<sup>(2)</sup>. Ineffective pain management continues to be a complaint of hospitalized patients despite the emphasis laid on the patient's right to appropriate pain management and the increased awareness of the detrimental effects of

pain that is in-adequately treated and managed<sup>(3)</sup>.

Pain is defined by the American Pain Society Quality of Care Committee, as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described by the patients in terms of such damage<sup>(4)</sup>. According to McCaffery et al. (2002)<sup>(5)</sup> the most accurate definition of pain is “Whatever the experiencing person says it is, existing whenever he says it does”. This definition of pain has implications for registered nurses as they assess pain. The patients experiencing pain only can describe the characteristic of their pain.

Insufficient education and training for nurses and patients were amongst the issues reported as poor post operative pain management<sup>(6)</sup>. Although studies have shown that pain education programs increase nurses’ knowledge and improve attitudes towards pain management, the management of post operative pain by nurses still remains a problem<sup>(7)</sup>. Many nurses, are still relying on their personal opinion about patient’s pain, rather than using their recorded assessment to assist them to choose appropriate opioids doses. Appropriate pain assessment tools are not utilized on a regular basis in acute care settings and this also contributes to under-treatment of pain<sup>(5)</sup>. Pain management has been an integral part of nursing practice for many years, yet there are still too many who lack the basic knowledge necessary to manage pain appropriately<sup>(5)</sup>. Further, unrelieved post operative pain may be harmful and adversely affect the quality of life amongst post operative patient<sup>(7)</sup>.

Ongoing assessment is necessary to evaluate changes in pain and the effectiveness of its management. The American Pain Society stresses that health care professionals should consider pain as the fifth vital sign<sup>(8)</sup>. Therefore, the patient’s pain should be assessed at least as often as vital signs are taken. Accuracy in pain assessment is a major factor in measuring the adequacy of pain management. This implies that health care professionals should identify the presence of POP for each patient, and score its intensity using standardized scales<sup>(9; 10; 11)</sup>. Pain scores are documented in writing, making them readily available to all the health care professionals.

Effective postoperative pain management is an essential component in the provision of quality of care<sup>(12)</sup>. It’s unethical to let the patients suffer from pain without adequate efforts to provide high-quality treatment<sup>(13; 14)</sup>. Poorly controlled postoperative pain induces physiological and psychological harmful effects on the patients. These effects include impaired wound recovery, increased metabolic rate and cardiac output, impaired insulin response, increased production of cortisol, and increased retention of fluids, and the risk of developing chronic

pain<sup>(15; 16)</sup>. Additionally, unrelieved pain may cause unnecessary suffering, anxiety, fear, anger, and depression to the patients<sup>(13; 17)</sup>.

It has been suggested that the key issue of postoperative pain management strategies is to “make the pain visible”. This can be done by accurate pain assessment documentation, as well as monitoring the efficacy of pain treatment and the documentation should also include the patient’s satisfaction<sup>(18)</sup>. For the safety of the patients, documenting daily nursing care in patients’ records is vital. The primary purpose of documentation is to communicate patient’s care among health team members and to provide legal evidence of the delivered care<sup>(14)</sup>. Postoperative pain assessment and management should be documented routinely in a systematic format. It can be documented as part of the vital signs record form<sup>(8; 19)</sup>.

The content of the documentation consists of information about the patients’ condition, his or her responses to illness, and the care that is provided. The ultimate purpose is promotion of the quality of care<sup>(20)</sup>. Additional documentation of patient’s pain history, clinical problems, treatment, and follow-up actions are needed to improve practice and research<sup>(21)</sup>. The nurse is responsible for the assessment, analysis, planning, implementation and evaluation of patient’s nursing care. In 1991, the Committee on Quality Assurance Standards of the Acute Pain Service (APS) developed quality assurance standards for relief of acute pain. Guidelines on Acute Pain Management Standards emphasized that pain should be assessed and documented on admission, after pain-producing procedures, new complaints of pain, routinely, and at regular intervals that depend on the severity of pain. The documentation should include all assessment and management measures in addition to the patients’ responses to pain and pain management<sup>(5)</sup>. Unfortunately, previous studies showed that nurses’ documentation of assessment, interventions, and treatment outcomes were inconsistent and infrequent<sup>(22; 21)</sup>.

Postoperative pain management should be based on a well-organized health care system that emphasizes consistent nursing education regarding proper pain management techniques<sup>(23; 18)</sup>. Education to support nurses with knowledge should be included in the hospitals’ quality improvement programs<sup>(15)</sup>. Results of recent studies in the field of pain control showed that the use of educational programs to enhance the nurses’ knowledge about POPAM, significantly improved postoperative pain control<sup>(24; 25; 26)</sup>. Also, many studies highlighted the effects of educating nurses on the delivery of high quality nursing care for postoperative patients. For example, Hansson, et al, (2006)<sup>(27)</sup> evaluated the effects of an

educational program on pain management routines. This study results revealed that nurses' assessment of pain with rating scales increased after the intervention, and their knowledge and management routines had improved.

Pain control in patients in the surgical setting remains a significant problem in health care. Recognition of the widespread under-treatment of postoperative pain has prompted recent corrective efforts from health care professionals throughout the world. Also, studies indicated that nurses still have negative attitudes that stand in the way of delivering a quality of nursing care to patients suffering from postoperative pain. Nevertheless, the literature did not convey any information implying that nurses holds the same negative attitudes or describe obstacles related to the quality of care regarding postoperative pain. Furthermore, there is clear evidence in the literature that nursing education through a well established pain management program improves patients' satisfaction with the pain services, and consequently improving the quality of nursing care. However, these studies discussed the application of the educational programs in western countries and not in parts of the world from the Middle East. This study took the initiatives of introducing such programs in this un-researched geographical area and the results might be looked at as the starting point for improving nursing care of patients with postoperative pain.

This knowledge is mostly concerned with the examinations of the patient's responses toward pain management services. However, limited research has been conducted in the area of studying nurses' experiences in working with patients having postoperative pain. Although many studies (28; 29) investigated the nurses' knowledge of postoperative pain and nurses' attitudes towards its management, these studies were conducted generally in the western world. There were only a few studies that have investigated postoperative pain in the Middle East area. This has left a large gap in the area of research investigating the nurses' knowledge, attitudes, and views in relation to postoperative pain. Consequently, this study originates from the need to investigate the current status of postoperative pain assessment and management in the surgical departments at Mansoura University Hospitals. Such knowledge is important in the encouragement of improving nursing care that aims in delivering high quality of nursing practice for patients having pain in the postoperative period. Moreover, this study provides evidence based data that are necessary for further development of nursing curricula for the under- and postgraduate nursing programs as well as in-service education in hospitals.

**The aims of this study were to:** 1-Assess nurses' documentation of pain assessment and management in the first three days postoperatively in the surgical wards at Mansoura University Hospitals. 2-Assess nurses' knowledge of and attitudes toward pain in the surgical wards. 3- Assess nurses' communication with patients and their satisfaction of pain management and, 4-Evaluate the effectiveness of implementing a postoperative pain assessment and management program (POPAM) on improving nurses' documentation, knowledge, attitudes and communication with patients and their satisfaction of pain management.

### Hypotheses

- H1** Nurses' documentation of pain assessment and management in the first three days postoperatively at the surgical wards will be improved after implementing a postoperative pain management program
- H2** Nurses' knowledge and attitudes toward postoperative pain assessment and management will be improved at the surgical wards after implementing a postoperative pain management program
- H3** Nurses' communication with patients and their satisfaction of pain management will be improved after implementing a postoperative pain management program
- H4** There will be a significant difference before and after implementing a postoperative pain management assessment and program on nurses' documentation, knowledge, attitudes and communication with patients and their satisfaction of pain management at the surgical wards.

## 2. Materials and Methods

### Materials

**Design:** Quasi-experimental study. A pre-post intervention design was used.

### Sample:

Nurses:

Eighteen female nurses (18) employed in general surgical wards, with various age, different level of education, held nursing positions, and from different surgical wards, they had a minimum of two years experience in the surgical wards, and willing to share, accepted to participate in the study and complete the questionnaires.

### Patients:

The inclusion criteria for the selection of patients whose records to be reviewed were: adult patient 18 years of age and above, admitted to the

hospital for surgery and stayed as inpatient in the general surgical wards for at least three days postoperatively. Patients who received pharmacological interventions for chronic pain management as these patients' pain may not be classified as acute, and patients with neurological, readmitted patients for previous surgeries, and minor skin procedures were excluded from the study.

### The Settings:

The surgical wards at Mansoura University Hospitals, Egypt were dedicated to provide care for patients underwent general surgical procedures and interventions mainly intra-abdominal surgeries, cardiothoracic, neurosurgical, and orthopedic. Routine care in these wards was similar and did not follow specific protocol regarding pain assessment and management, and nurses' generally treat patients' pain by providing the prescribed analgesia. Prescription of analgesia was individualized and depending on the attending surgeon. Moreover, there were no documentation standards and pain assessment tools have not been used by the health care professionals.

### Tools of the study

#### (1) Nurses' documentation for pain management:

The records review was performed using these instruments:

##### 1. Pain and Anxiety Audit Tool (PAAT):

The PAAT was developed by Manias (2003) to examine prescribing and administering activities for sedative and analgesic medication in postoperative patients and to describe nurses' documentation practices for pain management in nursing notes. This tool is divided into three sections. Section one contains questions about the patients' demographic profile, including age, diagnosis, gender, and current surgery. Section two was designed to collect information about the patients' infusions, anxiety and orders of analgesic and sedative medications. Section three was designed to request details about the nurses' documentation of pain management in the nurses' notes. Since section two of the tool was not congruent with the purpose of this study, so, only section one and three were used to collect data from the patients' records

##### 2. Numerical rating scale for pain assessment (Arabic version):

The Arabic version of pain rating scales translated by the author Abdalrahim M S (2009). In order to evaluate the quality of the nurses' pain assessment, patients' intensity of POP in the day of surgery and the third day after surgery were assessed. The assessment was based on a numerical rating scale (NRS). The numerical rating scale comprised

of a 10 cm horizontal line with end points marked as '0' and '10.' An increase in score denotes an increase in pain level and the score ranges from 0 – 10.

- 0 - No pain
- 1- 3 - Mild Pain
- 4- 6 - Moderate Pain
- 7 – 9 - Severe Pain
- 10 - Worst pain possible

##### 3. Comprehensiveness measuring instrument

Comprehensiveness of nursing records of pain was assessed using an instrument developed by Ehnfors & Smedby (1993). Notes on the pain management process were scored on a five-point scale, with scoring based on the following criteria:

1. The problem is described **or** interventions planned **or** have been implemented.
2. The problem is described **and** interventions **are** planned **or** have been implemented.
3. The problem is described **and** interventions are planned **or** have been implemented, **the nursing outcome is noted.**
4. The problem is described; interventions **are** planned **and** have been implemented, **the nursing outcome is noted.**
5. All steps comprising the nursing process are recorded. The recording is of relevance to nursing. A score of five indicates optimal comprehensiveness, covering the entire nursing process. A score of three is considered to be the minimum score for satisfactory documentation, encompassing problem description, intervention and outcome.

##### (2) Nurses' knowledge and attitude toward pain questionnaire

A questionnaire of 28 items comprising two domains: knowledge and attitude towards post operative pain management was administered. It was adopted and modified from Mc Caffery et al. (1995). It was an objective assessment tool to measure the nurses' knowledge and attitude with regard to pain control. The first 18 questions were of the "true or false" type related to nurses' knowledge towards post operative pain management. The last ten questions delved into their attitude towards pain management. A Likert's scale ranging from 1 to 5 (1 indicating "strongly disagree" and 5 "strongly agree") was used. Questionnaires were translated to Arabic Language. Before transforming the answers into a 0–100 scale, some items were recoded. A total score was computed for overall pain knowledge.

##### (3) Nurses' communication with patients and their satisfaction questionnaire

Data were collected during the two months period before the implementation of POPAM

program and two months after the implementation of the program. Patients were interviewed in the third postoperative day; the focus of the interview was to assess the nurses' communication about pain with patients and their satisfaction of nurses' intervention using a simple questionnaire designed by De Rond, de Wit, Van Dam and Muller (2000). It included the following questions:

1. Did you discuss pain with nurses?
2. Did you receive information about pain from nurses?
3. Did you receive your medications in a timely manner?
4. Were you satisfied with how well your pain was controlled?  
(Yes = 1, No=0)
5. How do you rate your satisfaction of pain management service? (0 = very unsatisfied, 1 = moderately satisfied, 2 = very satisfied)
6. How do you evaluate the quality of the information provided? (4 = very good, 3 = good, 2 = fair, 1 = not good)

### Methods

The Postoperative Pain Assessment and Management Program (POPAM) and Methods for Data Collection included: Formal approvals were obtained from the hospital's administration to carry out the interviews with patients and the nurses and to implement the program to the nurses. Also permission to access patients' records in the selected surgical wards was gained before starting data collection assuring that confidentiality and anonymity were maintained for both the patients and the nurses. Preliminary contacts with the nurses were carried out to determine the nurses' willingness to share and participate in the study. Nurses and the administrators were approached separately, to discuss the benefits and the advantages of the program for patients' care and for the improvement of practice. Nurses were reassured about the administration support and permission to implement the program.

Every patient and nurse involved in the study was provided with a clear explanation of the study and gave informed consent. The patients' records were prospectively audited using the mentioned instruments and data were collected from the day of the operation and continued for 72 hours following the procedure.

The POPAM program consisted of three components:

- 1- Auditing of patients records before and after the implementation of POPAM program
- 2- Education of the participated nurses about knowledge and attitude toward pain assessment

and management and testing their knowledge and attitudes toward pain.

- 3- Interview with patients in the third postoperative day to assess their communication about pain with the nurses and their satisfaction about nurses' intervention before and after the implementation of POPAM program.

4-

The patients' records were reviewed for about two months by two research assistants who were not involved in the documentation of these records. Sociodemographic variables including gender and age were collected by means of patient interviews. Medical variables including days of admission to hospital, diseases, and treatment were obtained from the medical records. The patients' records were randomly sampled for the study using the systematic random sampling technique. The research assistants took training for one week by the researcher on how to audit records using the tools of the study. To ensure that they understood the tools, the first researcher participated in the data collection procedure for the first department, and checked each item in the tools for accuracy and consistency. The research assistants recorded information collected from the nurses' notes relating to assessment of patient's pain, the use of an assessment tool, and the use of pharmacological and nonpharmacological interventions for pain. The nursing notes were examined on the first three days following the operation. Patients' records were audited before and after the implementation of the POPAM educational intervention.

Before and after two months of implementing the POPAM program, patients were interviewed in the third postoperative day. The focus of the interview was to assess the patients' communication about pain with the nurses and their satisfaction about nurses' intervention using a simple questionnaire designed by De Rond, de Wit, Van Dam and Muller (2000). During the interview, patients were asked about the extent to which they communicated about pain with nurses.

Before implementation of POPAM program, all nurses accepted to participate in the study in the surgical wards were instructed to respond to a questionnaire of 28 items comprising two domains: knowledge and attitude towards post operative pain management was administered. It was adopted and modified from Mc Caffery et al. (1995). It was an objective assessment tool to measure the nurses' knowledge and attitude with regard to pain control. The first 18 questions were of the "true or false" type related to nurses' knowledge towards post operative pain management. The last ten questions delved into their attitude towards pain management. A Likert's

scale ranging from 1 to 5 (1 indicating “strongly disagree” and 5 “strongly agree”) was used. Questionnaires were translated to Arabic Language. Before transforming the answers into a 0–100 scale, some items were recoded. A total score was computed for overall pain knowledge. Two months after the implementation of the POPM program, all nurses in the selected surgical wards answered the same questionnaire used in the pre-intervention phase. Nurses filled in a questionnaire about sociodemographic variables, pain, and pain management. The content validity of the tool was submitted to 10 experts in the field of medical surgical nursing, and medicine for their opinion on the items in the tool. Modification was done accordingly. A pilot study was conducted on 10 nurses who fulfilled the inclusion criteria for the selection of the sample to assess the feasibility and applicability of the tool. The purpose of the study was explained to the subjects and consents were obtained. The tools were found feasible and practical. No further changes were made in the tool after the pilot study and the investigator proceeded for the main study.

The program consisted of a formal lecture and a discussion, and focused on teaching nurses the basic knowledge and attitudes about the current trends in pain assessment and the use of pain scales, pain treatment with analgesics, and the use of nonpharmacological pain treatment. Participants were given a guide booklet about the POPAM program. Three educational sessions for two weeks were conducted to facilitate nurses' attendance according to their shifts. The session usually included 5-7 nurses that were conducted in hospital setting. The researchers were available on call for any questions or issues raised by nurses when implementing the program. Nurses were asked to rate the patients' intensity of pain on a Numerical Rating Scale (NRS), and the researcher provided the ward with a sufficient number of scales to be used when needed.

In order to evaluate the quality of the nurses' pain assessment, the main researcher and two trained research assistants assessed the intensity of POPAM for patients in the day of surgery and the third day after surgery. The assessment was based on a numerical rating scale (NRS) from 0 (no pain) to 10 (greatest pain). After that, the attending nurses then were asked to estimate the patient's present pain intensity using the same scale.

The nurses' assessment was evaluated by comparing the mean difference between the

researchers' pain intensity scores and the nurses' rating scores, where the researchers' assessment was set to be the reference point for accurate rating. The nurses' assessment was considered to be accurate if their rating scores were identical or ranged between +1 and -1 with the researchers' scores. Nurses' pain rating scores that were 1 point higher or lower than the researchers' pain scores were considered overestimations or underestimations of patients' pain intensity, respectively.

### Statistical analysis

Data were analyzed using the Statistical Package for the Social Science for Window (SPSS, version 15). Descriptive statistics (including frequency distributions and measures of central tendency) were used to organize and summarize the data. Results were recorded as frequencies, percentages, means, and standard deviations. To determine the effect of the POPAM program and one sample t- test was used to evaluate the differences in nursing documentation before and after the implementation of the program. Pair samples test was used to evaluate the differences in nursing documentation amongst the three postoperative days. Responses to the questionnaire items were dichotomized to correct/incorrect answers, and comparison of the mean scores on the questionnaire items between the answers in the pre- and posttest was made using one sample t- test. A p-value less than 0.05 were taken to be significant for all the statistical tests.

### Results

The majority of nurses were (44.4%) in the age of 30-40 years, most of them are diploma nurses (66.7%). More than half of the nurses (55.6%) had 10-13 years of experience, and half of them (50.0%) are staff nurses. 27.8% of the nurses had attended in-service related to pain assessment / management and received education about the same topic.

The majority of patients were male (61.9%) and (64.3%) in pre /post intervention groups respectively; most of patients were in the age of 41-50 years (30.9% and 35.7%), more than half of the sample had Intra-abdominal surgeries (54.8 % and 59.5%). More than two thirds of the patients had general anesthesia. There was no significant difference in patients' characteristics between pre intervention and post intervention group such as the age, the type of surgery, and the type of anesthesia. The description of the patients in both groups is presented in Table 2.

**Table 1** Demographic and background data of nurses studied (N= 18)

Demographic characteristics of nurses	N0= 18	%
Age (years)		
20-29	4	22.2
30-39	8	44.4
40-49	5	27.8
50 and above	1	5.6
Education		
Diploma	12	66.7
Bachelor's degree	6	33.3
Master's degree	0	0.0
Experience (years)		
2-5	1	5.6
6-9	5	27.5
10-13	10	55.6
14-17	1	5.6
18 above	1	5.6
Position		
Supervisor Nurse	6	33.3
Head Nurse	3	16.7
Staff Nurse	9	50.0
Pain training program		
Attended in-service related to pain assessment / management	5	27.8
Taken part in multi-disciplinary discussions related to pain assessment or management	0	0.0
Received education on pain assessment / management	5	27.8
Discussed pain management with the Pain Team or Nurse Leader	0	0.0

**Table 2** Demographic profile of patients' pre and post intervention)

Patients' Demographic	Pre intervention n= 42		Post Interventions n = 42		P -value
	N0.	%	N0.	%	
Age (Mean, SD)					
18-30	7	16.7	9	21.2	NS
31-40	12	28.6	10	23.8	
41-50	13	30.9	15	35.7	
51-60	11	26.2	8	19.0	
Gender					NS
Male	26	61.9	27	64.3	
Female	16	38.1	15	35.7	
Type of surgery					NS
Intra-abdominal	23	54.8	25	59.5	
Orthopedic	9	21.2	7	16.7	
Intra-thoracic	10	23.8	10	23.8	
Types of anesthesia					NS
General	37	88.1	38	90.5	
Regional	5	11.9	4	9.5	

NS = not significant. (P&gt;0.05)

(1) **Improved documentation of postoperative pain assessment**  
**Improved quality of the nurses' pain assessment**

Findings were found when examining the patients' records using NANDA characteristics for the diagnosis of acute pain after implementing the program. These findings revealed that nurses tend to frequently document patients' self report of pain and the patients' crying (22% and 32% of the patients' records respectively). The other acute pain characteristics such as restlessness and changes in pulse were rarely documented or absent.

Rating of pain on the numerical rating scale (NRS) by both the researchers and the attending nurses was carried out on two occasions (the day of surgery and on the third day after surgery) before and after the intervention. Considering the researchers' assessment as a reference point for accurate rating, the mean difference between the nurses' and researchers' pain intensity rating scores was

considered to be significant if it was within a range of +1 and -1.

After the implementation of the POPAM program, there was a significant ( $p < .05$ ) agreement between the pain ratings of the researchers' and the nurses' ratings, where the mean scores differences were less than one point on the two occasions of assessment. Whereas the mean scores before the intervention phase was found to be 2.17mm on the day of surgery and 1.72mm on the third day of surgery compared to 0.44mm and 0.76mm respectively after the implementation of the program. Thus, these findings indicated that nurses became more accurate in their assessment of patients' pain intensity after the implementation of the POAPM program.

**Table 3** Scores of comprehensiveness in recording of pain management

	Comprehensiveness Criteria	Pre intervention N=42		Post interventions N=42		P value
		No.	%	No.	%	
0	Evidence of documentation	8	19.0	22	53.4	$p < 0.05$
1	The problem is described or interventions planned or have been implemented.	7	16.7	21	50.0	$p < 0.05$
2	The problem is described and interventions are planned or have been implemented.	6	14.3	16	38.1	$p < 0.05$
3	The problem is described and interventions are planned or have been implemented. The nursing outcome is noted	6	14.3	19	45.2	$p < 0.05$
4	The problem is described; interventions are planned and have been implemented. The nursing outcome is noted.	7	16.7	19	45.2	$p < 0.05$
5	All steps comprising the nursing process are recorded. The recording is of relevance to nursing.	3	7.1	7	16.7	$p < 0.05$
Total			14.7		40.5	

\*A score of 5 indicates optimal comprehensiveness. A score of 3 points is considered to be the minimum score for satisfactory documentation.

The results of auditing the 42 pre intervention patients' records revealed that the mean score was 0.7 on a scale ranging from 1 to 5, and more than 90% of the records were ranked below the minimum score for a satisfactory documentation. Only 19.1% of patients' records had evidence of documentation. About 7.1% of the records received the lowest score in the documentation process, and about 16.7% records contained evidence of planned, implemented interventions and outcome notes for pain relief. In most records, there was no obvious plan of care, and no outcome notes that indicate the progress of the problem or the response to management (Table 3)

In assessing the comprehensiveness of nursing

documentation, Findings of auditing the patients' records showed that after the implementation of the POPM program, revealed that the mean score was 2.1 compared to 0.7 in the pre operative intervention on a scale ranging from 1 to 5, and not reach to the satisfactory level. Evidence of documentation of patients' records had the highest score in the post intervention phase 52.4%. About 16.7% of the records received the lowest score in the post documentation process, and about 45.2% records contained evidence of planned, implemented interventions and outcome notes for pain relief (Table 3).

**Table 4** Pre and post intervention of pain assessment documentation in patients' day of surgery

Pain assessment documentation	Pre intervention N=42		Post interventions N=42		P value
	No.	%	No.	%	
Evidence of Documentation	3	7.1	22	52.4	p <0.05
Verbal statement about pain	3	7.1	17	40.5	
Location	4	9.5	23	54.8	
Use of pain scale	1	2.4	22	52.4	
Duration of pain	3	7.1	21	50.0	
What improves pain?	3	7.1	21	50.0	
What aggravates pain?	3	7.1	20	47.6	
Quality of pain	3	7.1	20	47.6	
Verbal statements of pain	2	4.8	22	52.4	
Nonverbal observations of pain	2	4.8	17	40.5	
Use and effects of pain medication	3	7.1	23	54.8	
Symptoms associated with pain and side-effects of pain medication	1	2.4	22	52.4	
	1	2.4	21	50.0	
Total		14.6%		53.8%	

Note: more than one alternative can be noted in one record.

In the pre intervention phase, documentation of pain management was audited in relation to four major areas using the PAAT instrument. In the day of surgery, the findings revealed that there was an evidence of documentation of pain assessment in 14.6 % of patient's records. In 9.5 % of nurses' notes the location of pain was described, which was the most frequently recorded information for pain assessment. On the other hand, there were 2.4 % of the nurses who used the pain scale, and 2.4 % of the nursing notes reported the quality of pain (Table 4).

Patients' records were audited to assess the documentation of pain assessment after the implementation of the POPAM program. The findings showed that after implementation of the POPAM program, there was a significant increase in the entire documentation items in the pain assessment category. All of the assessment information in the patients' records increased in the post-intervention phase that become 53.8%, mostly in the description of the location (54.8% vs. 9.5%), the duration (50 % vs. 7.1%), and what improves the pain (50.0 % vs 7.1 %). In addition, the majority of the nurses used scales to evaluate the patients' pain which was not evident in the pre-intervention phase (50.0 % vs. 7.1%). The total documentation of pain increased to 53.8 %.( Table 4).

The findings of patients' records before the implementation were audited to assess the documentation of pain assessment revealed that the non-pharmacological interventions were documented in 4.8 % of nursing notes. There was missing information about the pain medication (Pharmacological interventions) in 9.5% of the patient's records, and those who provided such information (83.3%) were mostly concerned with the quantity of medications given. In addition, the

outcomes of the interventions were described in 11.9% of the nursing notes, but they mostly contained quantified evaluation of the pharmacological intervention, and there were no details about the side effects of the analgesics and observed non-verbal behaviors (Table 5).

In spite of the limited nurses' notes concerning the use of some non- pharmacological interventions in the post-intervention phase such as massage and relaxation methods, there was significant increase in the overall percentage of this category (34.5% vs. 4.5%). Furthermore, there was a significant increase in the percentage of patients' records (27.8 % vs.5.2%) that described the outcomes of interventions and for the most part that is concerned with the description of the side-effects of analgesics(42.9% vs. 0.0%). On the other hand, there was no significance difference between the pre- and the post-intervention phases regarding the documentation of pharmacological interventions, and there was no significant increase in the quantifiable and non-quantifiable evaluation of non-pharmacological interventions (Table 5).

The analysis of nurses' notes in the three postoperative days utilizing PAAT tool is represented by comparing the mean scores in each category. The findings showed that nurses tend to document postoperative pain assessment and interventions less often over time. A significant decrease was found in the documentation of patients' postoperative pain in all the tool's categories among the three postoperative days, mainly between the first and the third day. For example the mean score for documentation in the pharmacologic interventions category was found to be decreased significantly among the three days after surgery (38 % and 8.8% respectively).

**Table 5** Pre and post intervention of pharmacological, non-pharmacological and Outcome of interventions in patients' records on the day of surgery

Nature of documentation	Pre intervention N=42		Post interventions N=42		P value
	No.	%	No.	%	
<b>Non-pharmacological interventions</b>	2	4.5		34.5	
Evidence of documentation	1	4.8	24	57.1	p <0.05
Cough and deep breathing with a towel	2	2.4	10	23.8	p <0.05
Turning	1	4.8	11	26.2	p <0.05
Education	2	2.4	10	23.8	p <0.05
Position for comfort	2	4.8	17	40.5	p <0.05
Massage	0	4.8	17	40.5	p <0.05
Relaxation	2	0.0	16	38.1	p <0.05
Other interventions		4.8	11	26.2	
<b>Pharmacological interventions</b>		62.7		65.8	
Evidence of documentation	38	90.5	40	95.2	N.S
Quantifiable amount	35	83.3	38	90.5	N.S
Non-quantifiable amount	6	14.3	5	11.9	N.S
<b>Outcome of interventions</b>		5.2		27.8	
Evidence of documentation	5	11.9	22	52.4	p <0.05
Side-effects of analgesics/sedatives	0	0.0	18	42.9	p <0.05
Non-quantifiable evaluation of analgesics/sedatives	1	2.4	11	26.2	p <0.05
Quantifiable evaluation of analgesics/sedatives	5	11.9	11	26.2	p <0.05
Non-quantifiable evaluation of non-pharmacological interventions	2	4.8	4	9.5	p <0.05
Quantifiable evaluation of non-pharmacological interventions	0	0.0	4	9.5	p <0.05

Significance difference (p &lt;0.05)

Not significance =N.S

Note: more than one alternative can be noted in one record

**Table 6** Differences in documentation of pain assessment, interventions and outcomes in the first three postoperative days (N=42)

	1 <sup>st</sup> day of surgery	2 <sup>nd</sup> day of surgery	3 <sup>rd</sup> day of surgery	P value
	Mean scores	mean scores	mean scores	
Pain assessment documentation	25	15	9.5	
Non-pharmacological interventions	16	12.5	6	p <0.05
Pharmacological interventions	38	19	8.8	
Outcome of interventions	16	8	3.8	

Significance difference (p &lt;0.05)

Not significance =N.S

**Table 7:** Nurses' documentation of pain and anxiety audit tool: main categories before and after the intervention of the POPAM program

	Pre Intervention N=42	Post Interventions N=42	P value
	%	%	
Pain assessment	14.6	53.8	p <0.05
Non-pharmacological interventions	4.5	34.5	p <0.05
Pharmacological interventions	62.7	65.8	N.S
Outcome of interventions	5.2	27.8	p <0.05
Total	21.8	45.5	p <0.05

N.S = p &gt;0.05

Auditing nurses' notes in the three postoperative days utilizing PAAT tool in the pre intervention /post intervention phase showed that nurses tend to document postoperative pain assessment that increased significantly from 14.6% to 53.8% (p <0.05). A significant increase was found in the documentation of patients' postoperative pain in non-pharmacological interventions and Outcome of interventions in post intervention phase (4.5% to

34.5%) and (5.2% to 27.8%) respectively. There was no significance difference between Pharmacological interventions in the post intervention phase (p >0.05). All the tool's categories in the pre intervention /post intervention phase increased significantly from (21.8% % and 45.5%) respectively.

**(2) Nurses' knowledge regarding postoperative pain assessment and management**

Results of the 18 items questionnaire that is used to test the nurses' knowledge toward pain showed that after implementation of the POPAM program, there was a statistically significant difference in the number of correct answers between nurses' responses in the pre-intervention phase and their responses in

the post-intervention phase for the majority of the questionnaire items (50.2% to 85.8% (Table 8).

Positive attitude towards post operative pain management was reported by most of nurses while had poor or negative attitude. The respondents' attitude towards post operative pain management questions correctly answered is shown in Table 9.

**Table 8** Numbers and percentages of nurses' knowledge correct and incorrect answers before and after the intervention (N=18) Significance difference ( $p < 0.05$ )

Items in the Questionnaire	Pre Intervention N=18		Post interventions N=18		P - value
	No.	%	No.	%	
1. The goal of giving narcotic analgesic during the first 48 hours post operative is to relieve as much pain as possible.	4	22.2	16	88.9	p < 0.05
2. A patient should experience discomfort prior to giving the next dose of pain meds.	4	22.2	15	83.3	
3. When a patient requests increasing amounts of analgesics to control pain, this usually indicates that the patient is psychologically dependent.	5	27.8	15	83.3	
4. After the initial recommended dose of opioids analgesic, subsequent doses are adjusted in accordance with the individual patients' response	4	22.2	14	77.8	
5. When a patient in pain is receiving analgesic medication on a 'p.r.n.' basis, it is appropriate for the patient to request pain meds before the pain returns.	4	22.2	16	88.9	
6. Staff can always pick up cues from patients that indicate that they are in pain.	5	27.8	14	77.8	
7. The most accurate judge of the intensity of the patient's pain is patient himself/herself.	5	27.8	14	77.8	
8. Because narcotics can cause respiratory depression, they should not be used for patients.	4	22.2	15	83.3	
9. Based on one's belief a patient may think that pain and suffering is necessary	6	33.3	12	66.7	
10. It may often be useful to give a placebo to a patient in pain to assess if he is genuinely in pain.	6	33.3	12	66.7	
11. Lack of pain expression does not mean lack of pain.	6	33.3	14	77.8	
12. Patients having severe chronic pain often need higher dosages of analgesics than patients with acute pain.	6	33.3	14	77.8	
13. Increasing analgesic requirements are signs that the patient is becoming addicted to the narcotic.	3	16.7	14	77.8	
14. The most suitable dose of morphine for a patient in pain is a dose that best controls the symptoms; there is no maximum dose for morphine.	3	16.7	15	83.3	
15. Estimation of pain by a physician or a nurse is as valid a measure of pain as a patient's self-report.	5	27.8	15	83.3	
16. Comparable stimuli in different people produce the same intensity of pain .	4	22.2	15	83.3	
17. Non-drug interventions (e.g. heat, music, imagery, etc.) are very effective for mild-moderate pain control but are rarely helpful for more severe pain .	4	22.2	15	83.3	
18. After the initial recommended dose of opioids analgesic, subsequent doses should be adjusted in accordance with the individual patient's response.	6	33.3	16	88.9	
Total		50.2		85.8	

Table 9: Correct and incorrect answers of Nurses' attitude towards post operative pain management before and after the intervention program (N=18)

Items in the Questionnaire	Pre Intervention		Post interventions		P value	
	No.	%	No.	%		
1. If the patient can be distracted from his/her pain, this usually means that he/she does not have as high intensity of pain as he/she thinks.	6	33.3	16	88.9	p <0.05	
2. If a patient/family member reports that a narcotic is causing euphoria, she/he should be given a lower dose of analgesic	6	33.3	16	88.9		
3. One of the patient 'rights is to be free from pain.	5	27.8	15	83.3		
4. Allowing patients to administer their own pain medication (e.g. PCA) is a superior way to provide analgesia.	2	11.1	14	77.8		
5. I worry that a patient might become addicted to the analgesic I give.	4	22.2	16	88.9	p <0.05	
6. Patients with a history of substance abuse should not be given opioids for pain relief.	5	27.8	14	77.8		
7. The potency of pain relief measures selected for the patient should be determined based on the type of surgery rather than on the patient's report of pain intensity.	5	27.8	14	77.8		
8. Patients having severe chronic pain often need higher dosages of analgesics than patients with acute pain.	4	22.2	15	83.3		
9. Patients can cry sometimes; therefore, diversional activities are indicated rather than actual pain meds.	6	33.3	9	50.0		N.S
10. If a patient is a clock-watcher and asks for his/her medication each time he/she knows its due, after several days of this behavior, he/she may be addicted.	6	33.3	8	44.4		N.S
Total						

### (3) Nurses' communication with patients and their satisfaction

In this study, patients' communication with nurses was 23.8% in the pre intervention phase compared to 60.3% post intervention. Patients were asked questions that reflect communication with nurses about their pain and their satisfaction with the pain management service. Although the number of patients who talked about pain complaints with nurses was almost the same before and after the intervention of the program, there were 57.1% patients in the intervention group who received information about pain and pain management from nurses compared to only 11.9% patients before the

intervention. Similarly, the proportion of patients who were satisfied with the pain control intervention was higher after the implementation of the POPAM program (69.0% vs. 16.7 %, p <.05).

Moreover, the percentage of patients who were very satisfied with the pain management service was higher after the intervention program as compared with the percentage before the program (54.8 % vs. 7.1%). Furthermore, there was a significant increase (p <.05) in the percentage of patients (73.8 %) who rated the quality of information about pain given by the nurses as good and very good after the implementation of the program compared to 11.9% before the implementation.

**Table 10 Assessment of patients' communication with nurses and their satisfaction**

Items in the Questionnaire	Pre intervention N=42		Post interventions N=42		P value
	No.	%	No.	%	
1. Did you discuss pain with nurses?					NS P< 0.05 NS P< 0.05 P< 0.05
2. Did you receive information about pain from nurses?	11	26.2	13	30.9	
3. Did you receive your medications in a timely manner?	5	11.9	24	57.1	
4. Were you satisfied with how well your pain was controlled?	29	69.0	32	76.2	
5. How do you rate your satisfaction of pain management service?	7	16.7	29	69.0	
6. How do you evaluate the quality of the information provided?	3	7.1	23	54.8	
Total		23.8		60.3	

Significance difference (p <0.05)

#### 4. Discussion:

The findings from the study revealed that most nurses' notes contained limited information about observation of non-verbal patient's behavior of postoperative pain, pharmacological and non-pharmacological interventions, and there was a real deficiency in recording the outcomes of intervention. Also, the use of pain scales to assess the patients' postoperative pain during the first day and subsequent days was not evident. Moreover, documenting postoperative pain according to NANDA characteristics for acute pain showed considerable deficiencies in the patients' records. The same findings were reported through many previous studies on nursing documentation of pain<sup>(30)</sup>. The study also illustrated that nurses record the patients' experience of pain initially, but subsequent pain assessment documentation following the first day was almost absent. The infrequent documentation of subsequent assessments has also been found in some other studies<sup>(19)</sup>. In general, the quality of pain documentation in the present study was found to be very poor, which could be presented as an evidence for the presence of a problem of insufficient assessment and management practices that could be related to lack of knowledge in the importance of documentation.

The findings also showed that the process of postoperative pain management was not recorded in a comprehensive way, and most of the records were ranked below the minimum score for a satisfactory documentation. These findings might be explained by the lack of legislation and hospital policies that emphasize the importance of postoperative pain documentation and using pain scales. The (JCAHO) recommended the use of the Numeric Rating Scale for adult patients' population to measure the intensity of pain and to document it<sup>(31)</sup>. Unsatisfactory documentation could be related to the absence of well established guidelines for postoperative pain assessment and management. Another explanation is that nurses lack knowledge on the importance of nursing documentation, importance of pain management on surgical outcome and patient health and satisfaction and the need for using assessment tool to assess postoperative pain, or that nurses are not given enough time for documenting patients' care because they were overwhelmed by the heavy work load. Therefore pain documentation should be emphasized during nursing education and training as well. It is also necessary for hospitals to require nurses' notes on their charts for postoperative pain assessment and management and to investigate reasons for the unsatisfactory documentation and nurses work conditions.

Findings of the study draw attention to the fact

that there is an urgent need for improving POP assessment, management and documentation in surgical wards at Mansoura University hospitals, Egypt. According to McGreevy (2008) it is important to develop health workers, and keep them motivated and retain them in the institution and therefore in-service education and activities that focus on different problems and nursing care actions are of importance for keeping a satisfactory quality of care. Nurses should also be accounted for improving their knowledge based on findings from research.

Results from previous studies supported the use of educational programs to improve the health institutional quality of care. Some of these studies showed that educating nurses' will increase patients' satisfaction with the quality of pain management<sup>(24; 33)</sup>. Other recent studies revealed that the use of educational programs improved the pain assessment and management techniques provided for patients in pain which eventually raised the quality of care provided for patients<sup>(34; 27)</sup>.

The findings of the study showed that the implemented POPAM program demonstrated the feasibility of making substantial changes in improving POPAM and thereby the quality of nursing care based on patients' reports. When comparing the findings before and after the implementation of the program, there were significant changes in the nurses' practices and attitudes toward pain management. The following changes can be clearly noted after the implementation of the POPAM:

Patients in the intervention group reported that they received information about pain and pain management from nurses, and most of them (73.8%) rated the quality of the information provided as good or very good. This might be taken as support for the effectiveness of the quality improvement program in stimulating the participated nurses to apply the gained knowledge into their practice. A similar finding was found in a study by Chung and Lui (2003) in a survey conducted to examine postoperative pain intensity and patients' satisfaction level from POPAM which revealed that patients who received information about pain and its management reported lower level of current intensity of pain, and were satisfied with the health care professionals regarding their POPAM.

There was a significant agreement (mean score difference less than 1) between the researchers' ratings and the nurses' ratings. This means that nurses became more accurate in assessing patient's pain intensity and improved their abilities in using the scales effectively. However, no studies were found in the literature that compared the researchers' rating with the nurses' rating of pain intensity.

There was a significant improvement in nursing knowledge of and attitudes toward pain. The nurses developed better understanding about the nature of pain complaints, and their beliefs were changed mainly those related to the patients' right to be free from pain. This finding was congruent with other studies that supported the positive influence of the educational program in improving nurses' knowledge and practice regarding the care of patients in pain<sup>(24; 35)</sup>.

Nurses developed awareness about the nature of pain, its subjectivity, and their responsibility in treating it accordingly without judging the patients. According to McCaffery and Pasero (2002), pain is a subjective experience and the patient is the authority on pain not the clinician, and pain should be treated based on individual differences.

There were statistically significant improvements in most of the documentation categories and nurses started to use pain scales in their assessment of patients' postoperative pain. This means that nurses recognized the importance of documentation as an important indicator for their pain management practices. This finding provides strong evidence that the educational program not only motivated nurses to positively change their documentation practices, but also influenced their methods in assessing postoperative pain.

Despite of the positive findings from the evaluation of the implementation of the POPAM program, there were some areas in which there is still need for improvement. Nurses in the pre-intervention phase and the post intervention phase tended to document only quantifiable amount of pharmacological interventions. Also, the results showed that other than the description of the side effect of analgesics or sedatives, nurses' neglected documentation of the outcome interventions even after implementation of the educational program. This finding need to be interpreted cautiously as it might be that the prescribed analgesics were seemed to be adequate so that there was no need for other pain relief measures, or nurses still do not perform their role of on going evaluation of patients' response to interventions. Recent studies on the nursing attitudes and beliefs about pain management identified a gap between what nurses say and their actions in regarding to POPAM<sup>(37; 38)</sup>.

Another area that the results showed and still need to be improved is concerning to the use of NRS rating scale. Although nurses became more accurate in assessing patient's pain intensity and improved their abilities in using the scale, they tended to underestimate the patients' pain intensity even after the implementation of the program. This result is in contrast with some studies in this area<sup>(39)</sup>.

Furthermore, despite the improvement in the nurses' knowledge and attitudes toward POP following the education program, it seems that the nurses' still have some persistent traditional thinking and misconceptions about the use of opioids which might have a negative impact on their actions. One reason might be the unrealistic fears of creating side-effects or that pain is a sign from the body that is of importance for apprehending the deterioration in the patients' medical condition. Some previous studies found in the literature that support this explanation showed similar results about nurses' under-utilization of the teaching that was based on traditional thinking<sup>(40)</sup>. Findlay and Estabrooks (2006) described knowledge translation as a social process where research evidence is considered along with the personal preferences of the health care professionals and values of the organization.

Study findings suggest that further educational and organizational support is needed for effective practice in pain assessment and management. Further research should explore education programs that will maintain new knowledge over time. In addition, assessment of the effect that new knowledge has on the achievement of improved pain relief for patients should be explored in the future.

### Limitation of the Study

1- The limitation of this study is that it was based only on patients and nurses of Mansoura University hospitals. Findings can not be generalized for patients and nurses of other different university hospitals.

2-The study did not follow-up nurses to measure the long-term effects of documentation of pain assessment and management, their knowledge and attitude toward pain, and communication with patients

3-A larger sample would have been better in terms of validity and reliability, and a correlational study across different University hospitals would indicate differences in terms nurses' documentation of pain assessment and management, their knowledge and attitude toward pain, and communication with patients

### Conclusions

This study showed that our nurses were faced with patients' suffering of postoperative pain and were ambitious to provide good nursing care by alleviating their patients' pains. The findings illustrated that the implementation of an educational program for nurses to improve the quality of nursing

care provided for patients with postoperative pain might be successful. Nurses improved in many means related to the care of postoperative patients.

1- Nurses improved their knowledge about pain, and their attitudes toward it were evidently changed.

They became aware of the nature of pain, how it should be assessed and what the best management for the postoperative pain is.

2- The nurses developed the habit of assessing postoperative pain intensity using the NRS in addition to the assessment of other pain characteristics.

3- The nurses improved to a great extent their practice in documenting patients' pain. The patients' records showed a significant difference in the amount and the quality of nursing documentation which reflected the fact that nurses became more aware about the importance of documentation and might also mean that they change their practices toward better postoperative pain management.

#### **Implications for Nursing Practice:**

The findings of this study have many important implications for nursing practice and nurses are expected to take the responsibility of alleviating patient postoperative pain. This study provides opportunities for nurses to evaluate themselves in the area of postoperative pain knowledge and management practices which may affect their caring abilities and often help them to work better with other health professionals. This will later promote their personal and professional growth which will eventually be reflected on improving their practice to enhance the quality of nursing care provided for patients with postoperative pain.

Another implication related to nursing practice is that this study might increase the awareness of the health care professionals and the health institutions administration toward the establishment of team work to induce change with a common purpose in upgrading the quality of pain assessment and management. However, it is important that this team emphasizes sharing process, multidisciplinary approach and ongoing evaluation. Managers and supervisors can facilitate the application of educational programs and incorporate with the team to move more quickly in the desired change.

Furthermore, the implementation of the program was within the context of postoperative pain management in surgical wards at Mansoura Hospitals, where no national standards and limited resources are available for effective postoperative pain management. The findings add to a growing body of literature on the benefits of implementing educational programs for nurses to improve their

roles in caring for patients with postoperative pain mainly in Egypt and in other surgical wards in the world where personnel and financial resources are limited.

#### **Implications for Nursing Education:**

This study has implications relevant to nursing education in the nursing schools and in the in-service education of health care institutions. Knowledge regarding postoperative pain must be integrated in the educational curricula. It is essential that information about acute pain management tremendously well discussed in continuing education programs and seminars. Intervention research can be a worthwhile for educators because it may allow them to join the team by helping in solving problems related to the nursing care of patients with pain. As they do that, they are more apt to look at questions that address nurses' practice. Contribution of the teachers to nursing practice could involve using the findings from this study in curriculum development, or as part of in-service programs that demands active participation of nurses and nurse educators.

#### **Recommendations:**

It is recommended to replicate these studies to involve other surgical wards, and to study the effectiveness of implementing POPAM program in these wards. The nurses who attended the program should be evaluated over time to check if they are retaining what they learnt and to be evaluated by assessing patients' satisfaction with the nurses' pain management. Therefore recurrent educational activities and discussions about evidence and research findings among nurses are necessary.

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