

Evaluation of Paediatric Postoperative Pain Management among Nursing Staff Working in Tertiary University Hospitals: A multicentre Cross-sectional Study

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ABSTRACT

Background: Poor postoperative pain management represents unpleasant experience which occurs in patients following surgical procedure. Recently, there have been increasing efforts to improve the perioperative pain management of children. **Objective:** To evaluate the paediatric postoperative pain management practice as well as identification of paediatric postoperative pain management influencing factors. **Patients and methods:** This cross-sectional study was conducted in Mansoura University Children Hospital, Mansoura University Emergency Hospital (ICU units). Each hospital serves a wide range of young patient's ages from one day up to 16 years old. All nurses who were involved in paediatric postoperative pain management were subjected to a specific questionnaire which assess different items that may affect the postoperative pain management practice. **Results:** Forty-seven participants have completed this study. The availability of pain assessment tool, level of knowledge, pain assessment, use comfort measures and considering pain management as a major priority were higher among the studied nursing staff. Meanwhile, participants who paid more attention for pain assessment and recording were lower. Good pain management practice was higher in female, married participants and among bachelor's, technical institute of nursing graduates and secondary nursing school graduated staff. The availability of pain assessment tool, morphine stock, knowledge, pain assessment, management and handover were associated with higher good pain practice among the studied nurse group. **Conclusion:** Nursing graduation level, marital status, knowledge, training and familiarity with pain assessment, and management tools, effective communication and pain management handover are fundamental factors that significantly improve the paediatric postoperative pain services.

Keywords: Nurses, Paediatric, Pain management, Postoperative, Tertiary hospitals.

INTRODUCTION

Adequate pain treatment is not something that can be taken for granted. Despite the fact that the Declaration of Montreal (September 2010) declares that "access to pain management is a fundamental right," it is estimated that 80% of the world's population is afflicted by inadequate pain management, which is a severe problem in more than 150 nations ^(1,2).

Pain is a sensory and emotional experience that is unpleasant and is caused by real or prospective tissue damage ⁽³⁾. Postoperative pain is a significant consequence that affects people after undergoing surgery. In both industrialised and developing nations, it is linked to higher morbidity and death ^(4,5).

One of the responsibilities of nursing personnel, who are always at the bedside of their patients, is to assess pain ⁽⁶⁾.

Efforts to enhance the perioperative pain treatment of children have been improving for many years, however a significant percentage of children still experience perioperative discomfort ^(7,8).

The practice of paediatric anaesthesia varies considerably across countries, including the provision of postoperative analgesia, as evidenced by the results of the recent Anaesthesia Practice In Children Observational Trial (APRICOT) ⁽⁹⁾.

The reasons are multifactorial but may reflect differences in knowledge, infrastructure, organization, and health care economics among different countries. However, even in more affluent settings, paediatric postoperative pain management is highly variable and is still suboptimal in many centres ⁽¹⁰⁾.

According to many research, inadequate paediatric postoperative pain treatment is caused by a lack of nurse training and their attitude toward pain management ^(11,12).

The main aim of this study was to evaluate the postoperative pain management services for paediatric patients among nurses working in Mansoura University Hospitals' Surgical Departments. The secondary aim was to identify the factors, which affect the level of practices towards paediatric postoperative pain management among nurses working in Mansoura University Children and Emergency Hospitals.

PATIENTS AND METHODS

This cross-sectional study was conducted in Mansoura University Children Hospital, Mansoura University Emergency Hospital (ICU units). Each hospital serves a wide range of young patient's ages between one day and 16 years old.

Ethical considerations:

All participants completed informed written consent before being recruited in this study. An approval from Institutional Review Board (IRB-MFM) of Mansoura University, Faculty of Medicine with code number (R/16.12.32, March 2017) was obtained. Ethics guidelines for human experimentation were adhered to in line with the Helsinki Declaration of the World Medical Association.

Inclusion criteria:

Nurses who were working in the surgical departments, day surgery unit and surgical ICU who were involved in paediatric postoperative care and accepted to participate in the study.

Exclusion criteria: Nurses who refused to complete the questionnaire at the time of data collection.

Sample size: As all staff nurses who were working in the referral Mansoura University Children Hospital and Emergency Hospital ICU unit were included in the survey, the final sample size was 47 participants.

Study variables:

Age, gender, marital status, level of graduation, work place and duration of work experience, pain assessment tools, methods of communications and documentation of pain together with use and documentation of pain relief method on patients and nursing records, awareness, training, availability and follow of pain management protocols in the hospital, priority of pain management, communications among staff about pain management and availability of analgesics medications.

After filling the required items, good practice was considered when nurses scored above the mean average of answers. Meanwhile poor practice was considered when nurses scored below the mean value.

Data collection:

Self-administered questionnaire using google forum with a shared link with the volunteered nurses were used to collect the data. The questionnaire contained different items which assess the social status, level of knowledge, training and management of postoperative pain, in addition to postoperative pain assessment and management practice. This questionnaire was designed after reviewing of the related literatures. Data were collected by trained four anaesthesiologists and supervised by a senior colleague. The principal investigator took the responsibility of coordinating the nurses and explain the aim of the study. After that, a copy from the questionnaire was shared with the participant nurses and clarification for any difficulty was provided accordingly.

The suitability of the questionnaire data was tested by using pre-test of the questionnaire on 5% of the sample size for their accuracy and consistency prior to data collection period. The reliability of the questionnaire was checked by the reliability analysis. Moreover, the supervisors and principal investigator offered a feedback on daily basis for the data collectors. Finally, the collected data were checked carefully on a regular basis.

Statistical analysis:

IBM's SPSS statistics (Statistical Package for the Social Sciences) for windows (version 25, 2017) was used for statistical analysis of the collected data. Continuous variables were expressed as mean ± SD

while categorical data were expressed as number and percentage. Fisher exact test was used for inter-group comparison of nominal and ordinal data. All tests were conducted with 95% confidence interval. P (probability) value < 0.05 was considered statistically significant.

RESULTS:

Demographic data of the studied group are presented in table (1). Most of the participants were females, graduated from the secondary nursing school, working in surgical departments, married and holding experience more than 5 years in clinical practice.

Table (1): Demographic data, level of education and work place of studied group. Data are expressed as mean ± SD or number and % (n=47)

Variable	Number	%
Gender: Male	11	(23.40%)
Female	36	(76.60%)
Age (Years)	33.23 ± 7.45	
Level of Education		
2ry school of nursing	22	(46.81%)
Technical institute of nursing graduates	17	(36.17%)
Bachelor's degree	8	(17.02%)
Department		
Surgical department	24	(51.06%)
Day care surgery unit	17	(36.17%)
Surgical ICU	6	(12.77%)
Marital status		
Married	33	(70.21%)
Unmarried	14	(29.79%)
Experience		
< 5 years	17	(36.17%)
5-10 years	14	(29.79%)
>10 years	16	(34.94%)

The availability of pain assessment tool, level of knowledge, pain assessment by looking at their facial expressions and asking about their level of pain to give it a score, use comfort measures to provide pain relief, pain management handover in the ward and considering pain management as a major priority among the nursing staff were higher among the studied nursing staff when compared to those who did not care for these items. Meanwhile, the number of participants who paid more attention for pain assessment at regular intervals and recording the pain relief measures on patient's observation chart were lower comparative to those who did not paid attention for these items. In addition, morphine was available in limited number of units for proper pain management (Table 2).

Table (2): Practice of nurses about postoperative pain management at Mansoura University hospitals (n=47)

Variable	Yes	No	P value
Availability of pain assessment tool	31 (65.96%)*	16 (34.04%)	0.29
Familiarity with assessment tool	28 (59.57%)	19 (40.43%)	0.189
Education on assessment tool	27 (57.45)	20 (42.55%)	0.307
Use a pain assessment tool?	26 (55.32%)	21 (44.68%)	0.446
Training on postoperative pain management.	27 (57.45%)	20 (42.55%)	0.307
Knowledge	36 (76.59%)*	11 (23.40%)	0.001
Assess pain at regular intervals	14 (29.79%)*	33 (70.21%)	0.006
Record the pain rating on patient's observation chart?	12 (25.53%)*	35 (74.47%)	0.13
Assess pain by looking at their facial expressions and asking about their level of pain to give it a score?	32 (68.09%)*	15 (31.91%)	0.013
Availability of morphine in your stock	11 (23.40%)*	36 (76.59%)	0.001
Record the pain relief measures provided to the patient in the nursing records?	12 (25.53%)*	35 (74.47%)	0.001
Use comfort measures, e.g. change of position, massage, to provide pain relief?	46 (97.87%)*	1 (2.13%)	0.001
There is communication among the nurse with a patient with respect to the pain management in the ward?	39 (82.98%)*	8 (17.02%)	0.003
Priority of pain management by unit team	44 (93.62%)*	3 (6.38%)	0.002

*: Significant

Good pain management practice was higher in female participants when compared to male participants. The number of female nurses who were oriented with good pain management was higher in comparison to those who were not oriented. This was in contrast to the male nursing staff. Similarly, good pain practice was higher among bachelors, technical institute of nursing graduates as well as secondary nursing school staff participants when compared to those who showed poor practice.

The experience, place of work, familiarity with, training on and the use of pain assessment tool, did not have any effect on good or poor pain practice. Good practice was more common among married participant compared to non-married. The availability of pain assessment tool, morphine stock, knowledge, pain assessment at regular intervals and pain management handover during communication among the nursing staff were associated with higher good pain practice among the studied nurse group (Table 3).

Table (3): Good and bad practice of nurses at Mansoura University hospitals (n=47)

Variable	Good practice	Poor practice	P1	P2
Gender				
Male	2 (18.18%)*†	9 (81.82%)	0.035	0.006
Female	31 (86.11%)*	5 (13.89%)	0.001	
Level of Education				
2ry school of nursing	16 (72.73%)*	6 (27.27%)	0.033	0.001
technical institute of nursing graduates	12 (70.59%)	5 (29.41%)	0.09	
Bachelor's degree	7 (87.5%)*	1 (12.5%)	0.034	
Experience				
< 5 years	7 (41.18%)	10 (58.82%)	0.467	0.662
5-10	7 (50%)	7 (50%)	1	
>10 years	11 (68.75%)	5 (31.25%)	0.134	
Department				
Surgical department	16 (66.67%)	8 (33.33%)	0.102	0.189
Day care surgery unit	10 (58.82%)	7 (41.18%)	0.467	
Surgical ICU	2 (33.33%)	4 (66.67%)	0.414	
Marital status				
Married	31(93.94%)*†	2(6.06%)	0.001	0.001
Unmarried	6 (42.86%)	8 (57.14%)	0.982	
Availability of pain assessment tool	25 (80.65%)*	6 (19.35%)	0.001	
Familiarity with the pain assessment tool.	19 (67.86%)	9 (32.14%)	0.059	
Teaching on pain assessment tool	16 (59.26%)	11 (40.74%)	0.336	
Use a pain assessment tool?	17 (65.38%)	9 (34.62%)	0.117	
Knowledge	30 (83.33%)*	6 (16.67%)	0.001	
Assess pain at regular intervals	12 (85.71%)*	2 (14.29%)	0.008	
Availability of morphine in your stock	10 (90.91%)*	1 (9.09%)	0.007	
There is communication among the nurse with a patient with respect to the pain management in the ward?	37 (94.87%)*	2 (5.13%)	0.001	

*: Significant when good practice was compared to poor practice

†: Significant when subgroups were compared together

DISCUSSION

The current study tried to assess paediatric postoperative pain management and the associated factors that may influence it. This study tried also to highlight the correlation between knowledge, experience, and awareness differences among nurses concerned with the management of paediatric postoperative pain in Mansoura University Hospitals.

In our study, the likelihoods of having good practice among nurses was significantly correlated with priority of pain management by unit team (93.62%), availability of pain assessment tool (65.96%), familiarity with this tool (59.57%), use a pain assessment tool (55.32%), communication among the nurse with a patient with respect to the pain management in the ward (82.98%), use comfort measures, e.g. change of position and massage, to provide pain relief (97.87%) and training on postoperative pain management (57.45%) who were higher than its counterpart.

The chances of good practice among nurses in surgical department were higher when compared to those working in day care surgery unit. This finding was in agreed with studies conducted in Rwanda and Ethiopia^(13, 14). This might be due to work overload in day care unit or the inability to administer medication until a diagnosis is made, also patient's reluctance to report pain may limit nurses to perform with standards.

In other aspect, the poor practice of the participants in our study was correlated with decrease knowledge about pain management strategies (29.79%), defect in assessment of pain at regular intervals (25.53%), insufficient record of the pain rating on patient's observation chart (25.53%), insufficient record of the pain relief measures provided to the patient in the nursing records (25.53%) and availability of pain medications as morphine (23.40%).

This can be explained by the lack of training and education, also availability of the tools of assessment and familiarity to use them can make nurses more skilful on postoperative pain management. Communication between nurse and patients leads to understanding the problem and choice the method to solve. It is known that good practice among nurses who received advanced level of education (2ry School of nursing) showed significant higher levels than poor practice (72.76%). This finding was supported by previous studies which explained this by the fact that nurses with increased academic level have more ability to apply their knowledge into practice and skills which can be improved more easily if one has the required knowledge^(15, 16). Another study by **Vael and Whitted**⁽¹⁷⁾ deduced that education increased the nursing practices about pain assessment and documentation. **Brant et al.**⁽¹⁸⁾ designed a 3-hour workshop session to educate the nursing staff regarding the physiology and assessment of pain, a very important finding is the noted significant improvement not only between the pre-test

and post-test but also between the post-test and 3-month retention test.

Two studies have examined the influence of nursing lack of knowledge on the quality of pediatric pain management practices. **Twycross and Dowden**⁽¹⁹⁾ tested the relationship between knowledge and attitudes about children's pain-relief and nurses' analgesic administration practices. They found that nurses with a good pain knowledge were not more likely to administer analgesia. In contrast, **Twycross**⁽²⁰⁾ in a different study observed no positive relationship between individual children's nurse's knowledge level and the way of their postoperative pain management. Even when they have good level of knowledge. In addition, there was a knowledge deficit in relation to non-drug pain relief methods, analgesic drugs and the incidence of respiratory depression.

Despite the evidence to guide practice being readily available, still postoperative pain assessment and documentation practices need more improvement. Several studies have investigated nurses' use of non-medication methods for pain relief which all found a need to improve practices. Though, many of these studies relied on data collected through interviews and the results might represent what the participants believe the researcher wants them to report rather than the actual practice⁽²¹⁾.

Indeed, the (English) National Service Framework for Children and Young People states that children usually received suboptimal postoperative pain management. There is a need to explore the factors impacting on pain management practices further⁽²²⁾.

This study showed that nurses who had experience time in work more than ten years showed significant difference between good practice (64.71%) and poor practice (35.29%). This difference between levels of practice decreased as long as period of experience decreased. This difference is caused by the experience gained by time and practice improvement and development by time⁽²²⁾.

CONCLUSION

The present study showed that the nursing graduation level, marital status, knowledge, training and familiarity with different methods of pain assessment and management as well as documentation of pain level and measures on patient records are closely associated with good pain management practice. In addition, the effective communications among the nursing staff about pain management during daily handover together with the availability of rescue analgesic medications have a vivid effect on better postoperative paediatric pain services.

Finally, our study encourages all healthcare providers to consider paediatric postoperative pain management as high priority domain in health services with implantation of new training programmes to improve the awareness, knowledge and practice of

paediatric nurses in order to achieve a good quality practice.

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