

# Evaluation of acute postoperative pain monitoring program for nurses in Thailand

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## ABSTRACT

**الأهداف:** تقييم فعالية برنامج تقييم الألم بعد العملية الجراحية (APPMP)، وأسلوب وتطبيق الممرضات بمعهد دراسات العصبي.

**الطريقة:** أجريت هذه الدراسة خلال 1 مارس إلى 31 أكتوبر 2008م. تم توظيف عدد 35 ممرضة بقسم الأعصاب. تم تقييم الفعالية باستعمال 3 مؤشرات: نقاط معرفة الألم ونقاط الأسلوب ونقاط ممارسة التمريض. تم حساب متوسط النقاط لكل مجموعة بناءً على اختبار ما قبل إجراء APPMP. من أجل ما بعد اختبار APPMP. تم قياس نقاط معرفة الألم ونقاط الأسلوب مباشرة بعد تعليم المشاركين بينما تم قياس نقاط ممارسة التمريض بعد 6 أشهر. تم تحليل الإحصائيات الوصفية واختبار  $p < 0.001$ .

**النتائج:** ازدادت نقاط الألم بشكل ملحوظ من 36.3% إلى 64.8 مع نقاط الممارسة من 20.0% إلى 32.2%. (نسبة الخطأ أصغر من 0.001). بلغت نقاط أسلوب الألم 82.4% قبل الاختبار و بعد الاختبار. بلغ رضی المرضى خلال 24 ساعة بعد العملية +4.2/ -0.73 من 5.

**خاتمة:** كان APPMP فعالاً في تحسين معرفة ألم التمريض والممارسة. على الرغم من كون تغيير سلوك التحكم بألم المرضى ممكنه عند وقت الاستهلاك إلا أنه لا تزال الحاجة ضروري إلى التوعية واستشارة النظام من أجل التطبيق.

**Objectives:** To evaluate the effectiveness of an acute postoperative pain monitoring program (APPMP) on pain knowledge, attitude, and applicability of nurses at Prasat Neurological Institute, Bangkok, Thailand.

**Methods:** This study was conducted from 1st March to 31st October 2008, at the Prasat Neurological Institute, Bangkok, Thailand. Thirty-five neurological nurses were recruited. The effectiveness was evaluated using 3 indicators: pain knowledge score, attitude score, and nursing practice score. The mean score from each indicator group was calculated as the pre-APPMP launching test based. For the post-APPMP launching test, pain knowledge score, and attitude score were measured immediately after educating

the participants, while the nursing practice score was measured 6 months later. The descriptive statistics and paired t-test were analyzed. Statistical significance was set at  $p < 0.001$ .

**Results:** The nurses' pain knowledge score increased significantly from 36.3-64.8%, together with the practice score from 20-32.2% ( $p < 0.001$ ). The nurses' pain attitude scores were 82.4% in the pre-test, and 84.2% post-test. The patients' satisfaction for the 24 hour post-operation pain management was 4.2+/-0.73, on a 5-point Likert scale.

**Conclusion:** The APPMP was effective in improving nurses' pain knowledge and practice. Although changing nurses' behavior in controlling patients' pain is possibly time consuming, however, education and a consultation system are still necessary.

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Despite improved analgesics and sophisticated drug delivery systems, several surveys indicated that 50-80% of postoperative patients experience moderate to severe pain.<sup>1-3</sup> Many hospitalized patients suffer from pain, not only caused by the procedure or disease itself, but also the inadequacy of pain control.<sup>4</sup> Several factors contribute to inadequate postoperative pain control, including lack of understanding of preemptive pain management strategies, mistaken beliefs and expectations of patients, inconsistencies in pain assessment practice, use of as-needed analgesics request, and lack of analgesic regimens that account for inter-individual differences

and requirements.<sup>4,5</sup> It has been recognized that untreated, or poorly postoperative pain control causes unnecessary discomfort, patient dissatisfaction, longer hospital stays, increased expense, and less than optimal clinical outcomes.<sup>1,6-8</sup> These negative clinical outcomes included deep vein thrombosis, pulmonary embolism, coronary ischemia, myocardial infarction, pneumonia, poor wound healing, insomnia, and demoralization.<sup>9,10</sup> Pain that persists after the surgical wound has healed, usually lasting for more than 3-6 months after surgery, was a major clinical problem, and correlated with the risk of developing a persistent painful state.<sup>11</sup> One reason why the insufficient pain treatment occurs was the deficient knowledge and management among nurses.<sup>12,13</sup> However, the effects of educational programs on pain documentation were contradictory. Results from many studies showed that education and training for health care providers was associated with decreased patient pain intensity.<sup>14-17</sup> Only the results of Camp-Sorrell and O' Sullivan's study did not.<sup>18</sup> Furthermore, the efficacy of such combined programs on pain assessment and documentation found more pain record and recognition after the implementation of pain management protocols significantly.<sup>19-23</sup> Meanwhile, the implementing process of anesthesiologists' availability combined with nursing education, and practicing practical guidelines in daily pain assessment are not subsequently described. To address this problem, the acute post-operative pain monitoring program (APPMP) for nurses was constructed. It is a tool designed to improve knowledge, in order to change pain assessment practices and patient outcomes. This program consisted of 3 main parts related to pain perspectives, namely, knowledge provision, practice guideline recommendation, and manpower availability. The hypothesis of this program was expected to improve nurses' pain knowledge, attitude, and practice. Therefore, we conducted this study to measure the effectiveness of the APPMP in those categories among the nurses in Prasat Neurological Institute, Bangkok, Thailand, for a period of 8 months in 2008.

**Methods.** This study was approved by the Ethics Committee of Prasat Neurological Institute, Ministry of Public Health, Bangkok, Thailand. The quasi-experimental time series design was studied from 1st March to 31st October 2008. Thirty-five nurses were recruited from 7 neurological wards, and 2 intensive care units. The participants volunteered and consented to this study. Nurses who take care of postoperative patients in any ward were included, and those who were working in the outpatient unit, emergency unit, and operating theater were excluded in this study. The

effect of the APPMP was measured in a one-group pre-test, and post-test design. The demographic variables together with basic pain knowledge and attitude were recorded by the self-reported questionnaires. The pain perspective focused on the knowledge and attitudes on the current trends in pain assessment, pain treatment with analgesics, the use of a sedation score to reconfirm the accuracy of pain assessment and practicing practical guidelines, such as, how to conduct daily pain assessment were conducted both in formal lecture and group discussion. All of the nurses were instructed in daily pain assessment by means of a numeric rating scale from 0-10, in which 0 means "no pain at all," and 10 means "the worst possible pain." After the 6-hour education program was finalized, they had to complete a set of questionnaires on pain knowledge and pain attitude for post-test, and started to use the numeric rating scale, and the new consultation system with a senior anesthesiologist. At the first month after the implementation of the APPMP, all nurses were given a CD-ROM summarizing the main topics of the program to promote, and refresh their acquired knowledge in nursing practice. Six months later, to evaluate the impact of the program on nursing practice, the medical records of patients that had received opioids for acute postoperative pain in the previous 24 hours were selected for review. Information from the chart audits was used as evidence of pain-related activities referred to the nursing practice score. In addition, patients' satisfaction at 24 hours post-operation was surveyed to reassure the patients' outcome. In referring to the outcome measurement, the pain knowledge was assessed by using Sanansilp's<sup>24</sup> version of pain knowledge test that demonstrated acceptable levels of discrimination ( $r$ ), and difficulty ( $p$ ). The one best answer from 4 choices test, included 20 items measuring knowledge of basic anatomy and physiology of pain, pain assessment, sedation score, pain documentation and pain management, was given to all nurses. A total score was computed for overall pain knowledge, and expressed in percentages. The attitudes toward pain assessment and pain management were assessed by means of self-developed pain attitude tests. This test was previously carried out in a group of 30 nurses, and demonstrated an acceptable level of validity and reliability (Cronbach alpha = 0.72). The 10-item questionnaire was used to measure nurses opinions on several aspects of pain assessment and management on a 5-point Likert item ("strongly agree," "agree," "neither agree nor disagree," "disagree," "strongly disagree").<sup>25</sup> Before transforming the answers into a percentage scale, some items were recoded, and then computed for overall pain attitude score. Data regarding the documentation of nursing pain management practices were gathered

from charts using the pain-audit checklist, which was validated under the process of extensive literature review, and evaluated by a senior anesthesiologist. The contents were included in the documentation of pain assessments, such as, the usage of pain intensity ratings, the descriptions of pain details, the usage of pharmacological and non-pharmacological treatments, including the medication in the re-evaluation process, and the remarks of consultation service by a senior anesthesiologist as indicated.

Data were analyzed using the Statistical Package for the Social Science version 11.5 for Windows (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to evaluate nurses' socio-demographic characteristics and demonstrated as mean  $\pm$  standard deviation, number, and percent. Differences between pre-test, and post-test scores were analyzed using student's paired t-test. A  $p < 0.01$  was defined as statistically significant.

**Results.** Thirty-five participating nurses completed the whole questionnaire. An overview of the socio-demographic characteristics is shown in Table 1. All nurses were female with a mean age of  $44.8 \pm 9.06$  years (range 32-58 years). Meanwhile, the professional experience year was  $17.9 \pm 10.91$ , and 29 respondents (82.9%) had no previous participation in any additional pain study courses. The post-test pain knowledge mean score (64.8%) increased significantly compared with pre-test period (36.3%) ( $p < 0.001$ ), meanwhile the pain attitude score did not show any differences between pre-APPMP implementation test (82.4%), and post-APPMP implementation test (84.2%). The practice score at 6 months changed significantly from 20-32.2% ( $p < 0.001$ ). The nursing practice was obtained from medical records 6 months afterwards. Nearly one third

(34.3%) had increased recognition of the 24 hour available consultative service, 20 provided more specific details of pain in the nursing record, and 11.4% had performed more pain intensity evaluations with the numeric rating scale on a daily basis, at least 2 times in 8 hours as shown in Table 2. The patients' satisfaction within the 24 hour postoperative period after 6 months of APPMP implementation was  $4.2 \pm 0.73$  on a 5-point Likert scale fashion.

**Discussion.** Updated practice guidelines for acute pain management in the perioperative setting have suggested that education and training for health care providers is associated with decreased patient pain intensity.<sup>26</sup> The results of this study show that nurses' pain knowledge was not sufficient (64.8%), despite their great responsibility in adequate pain management is important to the patient's comfort and well-being. This finding is consistent with de Rond et al<sup>12</sup> who found a nurses' pain knowledge mean score of 77.3%, and Clarke et al<sup>13</sup> with a mean score of 62%. Most baccalaureate nursing programs offer some formal classes content on pain management, even though the allotted time is inadequate, and the curriculum often inaccurate, or outdated.<sup>27,28</sup> Continuing lack of in-depth education for health care providers on the current, effective pain management strategies, as well as their fears of causing opioid addiction, endure as barriers to the provision of optimum pain relief.<sup>29-31</sup>

**Table 1** - Demographics data of the participants (N=35).

Characteristics	n	(%)
<i>Age, years</i>		
<36	7	(19.9)
36-40	5	(14.4)
41-45	6	(17.1)
46-50	5	(14.4)
51-55	6	(17.1)
56-60	6	(17.1)
<i>Years of professional nursing</i>		
<10	11	(31.4)
10-20	8	(22.9)
21-30	11	(31.4)
>30	5	(14.3)
<i>Category of working duty</i>		
Nursing administration	12	(34.3)
Nursing service	23	(65.7)
<i>Nursing educational level</i>		
Bachelor degree	32	(91.4)
Master degree	3	(8.6)

**Table 2** - Practical pain related activity evidences.

Activity by documentation	Pre-APPMP implementation	Post-APPMP implementation	Percentage change
	n (%)		
Evaluate pain score at least 2 times in an 8-hour period	2 (5.7)	6 (17.1)	11.4
Locate pain site	23 (65.7)	30 (85.7)	20.0
Provide pharmacologic, and/or non-pharmacologic techniques for pain treatment	12 (34.3)	13 (37.1)	2.8
Re-assess pain treatment modalities	6 (17.1)	8 (22.9)	5.8
Recognition of consultation system	0 (0)	12 (34.3)	34.3
Evaluate side effects of pain treatment modalities	4 (11.4)	6 (17.1)	5.7
Observe patients behavior after treatment	2 (5.7)	4 (11.4)	5.7
APPMP - acute postoperative pain monitoring program			

The up-to-date published evidence reported by the American Society of Anesthesiologists Task Force on acute pain management is insufficient to evaluate the effects of the 24-hour availability of a consultant anesthesiologist.<sup>26</sup> Even though the APPMP was constructed to overcome pain management pitfalls, however, the acceptance and recognition of manpower provision, such as the availability of consultant anesthesiologists was insufficient. This result was similar to Clarke et al's<sup>13</sup> finding, in which the mean use of consultation service provided by the anesthesia pain service was only 35%. The current consultation approach should be reorganized. The recommendation was to pursue the institution to promote the consensus, and form a committee to take responsibility in perioperative analgesia at all times. It should be a group of anesthesiologists, surgeons, ward nurses, and medical allied personnel who are experiencing problems with any aspects of perioperative pain relief.<sup>26</sup> The other research of nurses' pain-related activity was consistent with a report on the Victorian Quality Council's Acute Pain Management Measurement Toolkit Implement Project.<sup>32</sup> This study proposed that the most suitable remark of pain information in the medical records should be in the nursing notes, which increased from 80.4-82.3%, while the increase from 65.7-85.7% was found in the item: participating nurses' located pain site. Whereas the activity of evaluating the patients pain scores at least 2 times in 8 hours increased only by 11.4%. The rest of the nurses' pain-related activity had changed positively less than 10%, which reflected an improper applicability. To deal with postoperative pain management effectiveness, nurses should be able to assess pain severity in diverse patient populations adequately, understand how to monitor physiological changes associated with pain and its treatment, address the psychosocial experiences accompanying pain, and know the consequences of inadequate analgesia.<sup>33</sup>

According to this study, the nurses' pain attitude mean score did not alter, not similar to the findings of other research, which stated that nurses pain attitude improved as a result of the pain education program.<sup>12,33,34</sup> The explanation of this situation could be the consequence of positive perception among nurses in the quality of pain management resulting in a highly satisfied level of attitudes primarily, so the changes of score were undetectable. Although the campaign to use pain assessment as a fifth vital sign has been recognized for more than a decade, this assessment is not yet officially adopted by the community of nurses. However, pain evaluation is already part of patient monitoring, which is carried out and recorded in the nurses' notes. Concerning patient's satisfaction, most

patients are satisfied with what they have received, such as psychological support, gentle nursing care, excellent pain control, and so forth.

Some previous studies showed high rates of appreciation despite having shown high pain levels.<sup>35,36</sup> Although the results of this study are promising, several limitations should be emphasized. In this recent study, there was no control group, and it could be possible that the increase in pain knowledge was caused by other factors besides the educational program. Moreover, the time frame might be too long. Six months for integration was a long time that unexpected factors may appear, and interfere with the outcomes. However, no major changes in the hospital policies were noted during that period, so this finding may reflect a real nursing practice. The ultimate circumstance might be human error, especially in the process of recording, which may be an important consideration as well. Finally, the charts audited may not be a good representation of the actual clinical practice. Due to the clinical setting in which the study took place, it was not possible to observe nursing practice directly.

In conclusion, the APPMP proved to be an effective method in increasing nurses' knowledge and applicability, regarding the quality of acute postoperative pain management. The possibility of implementing the APPMP in routine nursing practice should be considered. Even though the change in pain-related activity for the nurses progresses slowly, however, the education and consultation system can possibly make a difference. Setting up such interdisciplinary teams may be an important step for the promotion of the use of acute postoperative pain monitoring program in practice. Changes take time, and it would be valuable to illuminate patients' possibilities to participate in pain management further, and test implementation methods with varied length of educational program.

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