

Nurses' knowledge of pharmacological measures on acute pain management in Western Saudi Arabia

Abdullah M. Kaki, MChB, FRCPC, Mohammad F. Daghistani, MBBS, FRCPC, Ahmad A. Msabeh, RN.

ABSTRACT

الأهداف: لتحديد معلومات التمريض حول السيطرة على الآلام الحادة في مركز طبي متخصص.

الطريقة: تم توزيع 300 مغلغ استبيان على جميع أقسام مستشفى الملك خالد للحرس الوطني - جدة - المملكة العربية السعودية، خلال عام 2007 م، تم اختبار 3 نواحي محددة في هذا الاستبيان: رأي التمريض فيما يخص تحديد شدة الألم عن طريق المريض نفسه، الحاجة لزيادة الجرعة المورفين في حالة إن الجرعة الأولى كانت آمنة ولاكن غير كافية للسيطرة على الألم، رأي التمريض حول حالات الإدمان على المسكنات، زيادة تحمل العقار أو الإعتماد الجسدي عليه.

النتائج: فقط 45.8% من التمريض استعان بالمريض المبتسم لتحديد الألم، بينما استعان 55.1% بالمريض العابس. قرر 50% من التمريض عدم زيادة جرعة عقار المورفين للمريض المبتسم، و 30.5% عدم زيادتها للمريض العابس، بينما 7.6% و 19.5% منهم إعطاء زيادة من جرعات المورفين للمريض المبتسم والعباس على التوالي. أما بالنسبة لحدوث الإدمان: 38.1% من التمريض اخترن الجواب الصحيح (<1%)، بينما بالغ 41.6% في خطورة حدوث الإدمان وأعطوه نسبة بين 25-100%. القليل من التمريض استطاع اختيار الجواب المثالي فيما يخص نسبة زيادة تحمل العقار أو الاعتماد الجسدي عليه.

خاتمة: معلومات الممرضات عن الآلام الحادة وكيفية السيطرة عليها يشوبها الكثير من القصور في عدة نواحي. تثقيف الممرضات والحرص على تعليمهم متطلب لتحسين مستوى معلوماتهم حول الألم.

Objectives: To assess the nursing knowledge of acute pain management in a tertiary hospital.

Methods: Three hundred closed-answer questionnaires were distributed in various hospital departments at King Khalid National Guard Hospital in Jeddah, Saudi Arabia in 2007. Three main topics were tested in the questionnaire; nursing opinion on patient self-report of pain as a main indicator of pain intensity, the need to

increase opioids dose when the first dose had been safe but ineffective, and nurses' attitude toward the incidence of addiction, tolerance, and physical dependence.

Result: Of the respondents, 45.8% used the patient self-report of pain as an indicator of pain intensity in the smiling patient (A), and 55.1% relied on that in the grimacing patient (B). Fifty percent of respondents in patient A and 30.5% in patient B decided to give no more morphine to both patients despite their pain, while 7.6% and 19.5% of nurses selected the option of giving higher morphine dose to both patients. Only 38.1% of nurses chose the correct answer for risk of addiction (<1%) and 41.6% selected an exaggerated response range from 25-100% as a chance of addiction. Very few nurses recognized the problem of tolerance and physical dependence and picked the right answers.

Conclusion: Nurses' knowledge of acute pain management is deficient in many aspects. Proper education is needed to improve their knowledge of pain.

Saudi Med J 2009; Vol. 30 (2): 279-283

From the Department of Anesthesia (Kaki), Faculty of Medicine, King Abdulaziz University Hospital and the Department of Anesthesia (Daghistani), King Abdulaziz Medical City, King Khalid National Guard Hospital, Jeddah, Kingdom of Saudi Arabia.

Received 17th September 2008. Accepted 6th January 2009.

Address correspondence and reprint request to: Dr. Abdullah M. Kaki, Department of Anesthesia, Faculty of Medicine, King Abdulaziz University Hospital, PO Box 2907, Jeddah 21461, Kingdom of Saudi Arabia. Tel. +966 (2) 6408335. Fax. +966 (2) 6408335. E-mail: amkaki@yahoo.com

In spite of the great advances in health services, many patients continue to suffer from pain during their hospitalization.¹⁻³ Seventy-seven percent of adult patients experience pain after surgery, among them, 80% express moderate to severe pain.⁴ Studies have indicated that patients may be reluctant to express their pain experience voluntarily and they may expect that pain is an inevitable consequence of surgery that

they have to endure.⁵ These circumstances highlight the need for adequate assessment of pain and the availability of proper pain relief measures. Nurses have been blamed for inadequate pain management in many reports.^{6,7} The nurses' role in pain management is pivotal. It includes assessing patient's pain, carrying out pain relieving measures, and assessing the effects of care interventions.⁸ Nurses are often the cornerstone in postoperative pain management, as the assessment of pain is usually performed by nurses and the prescribed analgesic agents are administered by nurses. Hence, the decision to administer or withhold pain medication is well within the nurse's realm of practice. Nurses' pre-existing deficient knowledge of pain management can affect the level of pain experienced by a patient while in the hospital.⁹⁻¹¹ Patients suffering from unnecessary pain are likely to have longer healing times, hospital stay, and poorer patient outcome.¹² The aim of this study is to assess nurses' knowledge, beliefs, and attitude regarding postoperative pain assessment and management, administration of opioid, and the risk of addiction, tolerance, and physical dependence among patient using opioid.

Methods. The study took place at King Abdulaziz Medical City, King Khalid National Guard Hospital, Jeddah, Saudi Arabia in 2007. Information was obtained through the distribution of 300 closed-answer questionnaires based on a replicate of an earlier study questionnaire conducted in 1995.¹³ Questionnaires were distributed by hand to the nursing staff working in various hospital departments. They were asked to return them in pre-addressed envelopes provided with the questionnaires. Information on the voluntary and anonymous nature of the study was described to all nursing staff. Consent to participate in the survey was implied by returning the completed questionnaire. For this reason, ethics committee approval was not needed. The questionnaire was designed to assess 3 areas of nursing knowledge: 1) Nurses' view on the assessment and management of postoperative pain in 2 clinical situations. 2) Nurses' opinion on the used opioid dose and the administration of a second dose when the previous dose had been safe but ineffective. 3) Nurses' attitude of the incidence of addiction, tolerance, and physical dependence when opioids were prescribed to patients. The first section of the questionnaire included 2 case scenarios related to assessment and management of postoperative pain among one smiling (A) patient and one grimacing patient (B). Pain rating scale from 0-10 was used to facilitate the selection for respondents. The main 2 principles tested in this part were: patients

to provide a self-report of pain intensity as the main indicator of pain, and the adjustment of opioid dose according to the patient's need. The main principle of patient self-report of pain and not his vital signs or behaviors should be used as the major indicator of pain intensity, and an increase in the opioids' dose by 25-50% should be considered when the prescribed dose of opioid was safe, and not effective for an individual pain. The risk of addiction when opioids are used for pain relief is rare (<1%). Nursing concern of causing addiction should not interfere with appropriate management of pain. The second part of the questionnaire asked the respondents to grade their response regarding the risk of addiction, tolerance, and physical dependence by selecting one of suggested answers to detect any false impression among them, and to identify the nurses' ability to differentiate between the 3 situations. Definition of addiction, tolerance, and physical dependence were mentioned in the questionnaire to avoid any confusion that might occur in selecting the right answer (*Appendix 1). The validity of the used questionnaire has been tested before in many studies^{11,13} and no sign of difficulties was reported.

Data were analyzed using SPSS software (SPSS Inc, Chicago, IL, USA) Version 10 for windows. F test was used to test the nursing response to various questionnaire questions. Results were considered to be statistically significant at $p < 0.05$.

Results. Three hundred questionnaires were distributed on 8 hospital clinical wards, and 118 were returned (response rate 39%). Table 1 presents the demographic data of contributing nurses, their levels of education, working area, and years of experience. The nurse assessment of postoperative pain in both patients and the choice of morphine dose for each case vignettes are presented in Table 2. For patient A (smiling), only 45.8% of nurses recorded 8/10 on numerical pain scale, while 55.1% of nurses recorded 8/10 for patient B (grimacing). Nurses were more likely to accept the patient reporting of pain from the grimacing patient (B) than from the smiling one (A). Nearly 23% ignored the patient self-report of 8/10 and reported that as 0/10 on the numerical scale. The nurses were also more likely to increase the morphine dose for patient B than patient A (Table 2). Fifty percent of respondents in patient A, and 30.5% in patient B decided to give no morphine to both patients despite their pain, while 7.6% and 19.5% nurses selected the option of higher morphine dose to be given to patient A and B. Responses to the survey items related to addiction, tolerance, and physical dependence is presented in Table 3. In an answer to the question of the

*The full text including Appendix is available in PDF format on Saudi Medical Journal website (www.smj.org.sa)

Table 1 - Distribution of participating nurses among the various groups.

Distribution	Frequency n (%)
<i>Distribution according to gender</i>	
Female	98 (83.1)
Male	20 (16.9)
<i>Distribution according to level of education</i>	
Diploma	43 (36.4)
Bachelor	73 (61.9)
Master	2 (1.7)
<i>Distribution according to working area</i>	
Medical	13 (11.0)
Male surgical	27 (22.9)
Obstetrics and gynecology	15 (12.7)
Triage	6 (5.1)
Renal	7 (5.9)
Oncology female-male	36 (30.5)
Intensive care unit/critical care unit	14 (11.9)
<i>Distribution according to experience (years)</i>	
<10	45 (38.1)
10 - <20	47 (39.8)
20 - <30	16 (13.6)
30 - <40	10 (8.5)

Table 2 - Nurses' assessment of pain and choice of opioid dose.

Assessment of pain	Number of patient A (smiling) (%)	Number of patient B (grimacing) (%)
0	27 (22.9)	1 (0.8)
1	8 (6.8)	1 (0.8)
2	9 (7.6)	2 (1.7)
3	8 (6.8)	9 (7.6)
4	5 (4.2)	10 (8.5)
5	2 (1.7)	8 (6.8)
6	3 (2.5)	7 (5.9)
7	2 (1.7)	8 (6.8)
8	54 (45.8)	65 (55.1)
9	0 (0)	1 (0.8)
10	0 (0)	6 (5.1)
Total	118 (100)	118 (100)
<i>Selection of opioid dose</i>		
No morphine	59 (50)	36 (30.5)
1 mg IV now	33 (28)	29 (24.6)
2 mg IV now	17 (14.4)	30 (25.4)
3 mg IV now	9 (7.6)	23 (19.5)
Total	118 (100)	118 (100)

Table 3 - Nurses' knowledge on the occurrence of addiction, tolerance and physical dependence among patients receiving opioid for pain relief.

Nurses' knowledge	<1%	5%	25%	50%	75%	100%
	n (%)					
<i>Percentage of patients likely to develop "addiction"</i>						
All patients	45 (38.1)	24 (20.3)	25 (21.2)	12 (10.2)	6 (5.1)	6 (5.1)
Patient who received opioid 1-3 days	49 (41.6)	30 (25.4)	30 (25.4)	5 (4.2)	4 (3.4)	0 (0.0)
Patients who received opioids 3-6 months	10 (8.4)	15 (12.7)	25 (21.2)	25 (21.2)	29 (24.6)	14 (11.9)
Average patients who developed addiction	14 (11.8)	40 (33.9)	35 (29.7)	25 (21.2)	4 (3.4)	0 (0.0)
<i>Percentage of patients likely to develop "tolerance"</i>						
Patients who received opioids 1-3 days	58 (49.1)	25 (21.2)	23 (19.5)	8 (6.8)	4 (3.4)	0 (0.0)
Patients who received opioids 3-6 months	8 (6.8)	21 (17.8)	22 (18.6)	28 (23.7)	29 (24.6)	10 (8.5)
Average patients who developed tolerance	7 (5.9)	30 (25.4)	37 (31.4)	33 (28)	11 (9.3)	0 (0.0)
<i>Percentage of patients likely to develop "physical dependence"</i>						
Patients who received opioids 1-3 days	51 (43.3)	29 (24.6)	24 (20.3)	7 (5.9)	6 (5.1)	1 (0.8)
Patients who received opioids 3-6 months	7 (5.9)	17 (14.4)	29 (24.6)	21 (17.8)	28 (23.7)	16 (13.6)
Average patients who developed physical dependence	6 (5.1)	32 (27.1)	32 (27.1)	35 (29.7)	10 (8.5)	3 (2.5)

likelihood occurrence of addiction in patients receiving opioid for pain relief, 38.1% chose the correct answer as <1% and 41.6% selected an exaggerated response range from 25-100% as a chance of addiction. Regarding the incidence of tolerance 31.4% selected the 25% as an answer, 28% went for a higher incidence of 50%, and 9.3% selected 75% a much higher risk, 29.7% of respondents answer regarding physical dependence was 50%, and 2.5% selected the 100% chance of physical dependence, 49.1% of nurses knew that less than 1% is the right answer for the risk for tolerance with opioids use for 1-3 days, and 43.3% of respondents knew that for physical dependence. The gender effect on the nurses' knowledge of acute postoperative pain assessment and management, the use of pain scale, morphine doses, risk of addiction, tolerance, and physical dependence were assessed using t-test and it was found non-significant statistically ($p \geq 0.222$). Similar to gender relation, no significant correlation was demonstrated between the various study questions and the level of nurses' education, practicing area, or years of experience. F-test was used to correlate these different variables to each component, and it was not significant ($p \geq 0.667$).

Discussion. Nurses tend to spend more time with patients complaining of pain than any other medical staff and tend to perform many interventions to relieve pain. Despite of that, their limited knowledge of pain still a persisting problem. and many surveys provide incontrovertible proof that nurses caring for patients with pain lack adequate information on pain management.⁶⁻⁷ In our study, more than one-half (53.2%) of the respondents selected a pain rating away from what the patient reported in patient A, and 55.1% of them selected the same pain rating as the one given by the patient in the grimacing patient B. This finding indicates that nurses were more likely to accept the report of pain from the grimacing patient than from the smiling one. The dependence on other factors rather than patient-self report of pain for assessment of pain was obvious, similar to a previous survey among 456 nurses, in which more than one half of nurses selected a pain rating different from what the patient reported.¹³ In another study conducted in the late 1970s, nurses selected patient verbal report of pain as the fifth on a list of 7 indicators of pain,¹⁴ which reflected the existence of an old believe among nurses that asking patients about pain is not the acceptable way. In a similar response, nurses tend to increase the dose of morphine for the grimacing patient but not for the smiling one. Although, the correct choice of morphine dose for both patients was the administration of 3 mg of morphine. A small percentage of nurses selected that choice for the grimacing patient, and an even lower percentage

for the smiling patient. Under-treatment of pain was more likely for the smiling patient. A similar finding was reported in many previously published studies in which nurses did not increase the dose of opioids when the previous dose had been safe but ineffective.^{11,13,15-17} Vital signs, age, and life styles were found to have more control on the nurse's decision for the administration of a second dose of opioid more than the patient complain of pain.^{13,15-17} Nurses' exaggerated fear of causing addiction by administering opioid analgesics is well documented in many studies.¹⁸⁻²⁰ In the same survey, 66% of practicing nurses and 63% of nursing students believed that more than 10% of hospitalized patients with organic pain become addicted.¹⁸ Our finding was similar to that, 58.4% of the respondents selected a low incidence rate of addiction (<5%) as a chance of addiction with opioid use. Only 38.1% of the respondents selected the right answer of <1% among all patients, while the rest of the nurses choose a more exaggerated response, and 41.6% selected the 1% answer with short-term use of opioid and 8.4% with long term administration of opioid. Overall, the chance of addiction was increased with longer-term use of opioids. Although their response is similar to other survey' findings (conducted in 1988-1989), in which 43% of the nurses believed that the likelihood of addiction was 1% or even less,²¹ the fear of addiction is still a persisting problem, and further studies are needed to identify the factors that might affect the nurse's concern about addiction in our society. McCaffery and Ferrell²² found in one study that the length of the time on opioid medications was the main concern for nurses regarding the development of addiction.²² A full definition of addiction, tolerance, and physical dependence was provided in the survey to avoid any confusion between the 3 situations especially with the knowledge that both tolerance and physical dependence do not occur in all patient receiving opioids chronically and they should be expected following long term use of opioids (one month or longer).²³ The accepted answers for that part of the question was 75-100% as incidence of tolerance and physical dependence with long term use of opioids. Very few nurses recognized the problem and picked the right answers. Comparing our findings with McCaffery and Ferrell's survey conducted 10 years ago,¹¹ nurses' willingness to accept the patient's self-reporting of pain in their assessment of pain was lower in our study than the other study for both smiling and grimacing patients (45.8% versus 73.8% for smiling patient and 55.1% versus 87.1% for grimacing patient). The nurses' response to the increase of morphine dose was also significantly lower among our group when compared to McCaffery et al findings (7.6% versus 51.5% for smiling patient and 19.5% versus 71.3% for

grimacing patient). The selection of the right answer concerning the likelihood of addiction was 38.1% in our study opposite to 62.7% in the previous. Although it is unfair to compare our study to McCaffery and Ferrell's survey findings with all the variables between the 2 sample groups, it reflects the existence of a serious problem requesting proper mechanism to improve the nurses' knowledge of acute pain. This difference might be related to lack of education of healthcare professionals on pain,^{2,24} various backgrounds of participating nurses as they came from various countries with different education levels, cultural reasons, or other unidentified causes. Further studies are needed to identify these factors. Meanwhile, more effort is needed to improve the nursing knowledge of pain, the way of pain assessment and management, administration of opioids dose, and the safety of administration of a second dose, and the rare incidence of addiction when opioids are used for organic pain. General practice guidelines for pain management are needed to facilitate the medical staff's practice.

One limitation of the existing study is the problem of sampling bias as the surveyed nurses are not the proper representative of practicing nurses in the general clinical field. The small sample size might contribute to the negative relation between nurses' education level, practicing area, or years of experience, and their knowledge of acute postoperative pain.

In conclusion, nurses need to recognize that they play an important role in the management of pain and the improvement of pain management requires them to improve their knowledge and change their attitude of the assessment and the management of pain.

References

1. Donovan BD. Patient attitudes to postoperative pain relief. *Anaesth Intensive Care* 1983; 11: 125-129.
2. Marks RM, Sachar EJ. Undertreatment of medical inpatients with narcotic analgesics. *Ann Intern Med* 1973; 78: 173-181.
3. Sriwatanakul K, Weis OF, Alloza JL, Kelvie W, Weintraub M, Lasagna L. Analysis of narcotic analgesic usage in the treatment of postoperative pain. *JAMA* 1983; 250: 926-929.
4. Warfield CA, Kahn CH. Acute pain management. Programs in U.S. hospitals and experiences and attitudes among U.S. adults. *Anesthesiology* 1995; 83: 1090-1094.
5. Carr ECJ. Postoperative pain: patients' expectations and experiences. *J Adv Nurs* 1990; 15: 89-100.
6. Maxam-Moore VA, Wilkie DJ, Woods SL. Analgesics for cardiac surgery patients in critical care: describing current practice. *Am J Crit Care* 1994; 3: 31-39.
7. Tittle M, McMillan SC. Pain and pain-related side effects in an ICU and on a surgical unit: nurses' management. *Am J Crit Care* 1994; 3: 25-30.
8. McCaffery M, Beebe A. Making the best of inadequate analgesics. *Nursing* 1994; 24: 32C-32D.
9. Clarke EB, French B, Bilodeau ML, Capasso VC, Edwards A, Empoliti J. Pain management knowledge, attitudes and clinical practice: the impact of nurses' characteristics and education. *J Pain Symptom Manage* 1996; 11: 18-31.
10. Greipp ME. Undermedication for pain: an ethical model. *ANS Adv Nurs Sci* 1992; 15: 44-53.
11. McCaffery M, Ferrell BR. Nurses' knowledge of pain assessment and management: how much progress have we made? *J Pain Symptom Manage* 1997; 14: 175-188.
12. National Institute of Nursing Research. A report of the NINR priority expert panel on symptom management: Acute pain 1994; (NIH Publication No. 94-2421).
13. McCaffery M, Ferrell B. How would you respond to these patients in pain? *Nursing* 1991; 21: 34-37.
14. Jacox AK. Assessing pain. *Am J Nurs* 1979; 79: 895-900.
15. McCaffery M, Ferrell BR. Patient age. Does it affect your pain-control decisions? *Nursing* 1991; 21: 44-48.
16. McCaffery M, Ferrell BR. How vital are vital signs? *Nursing* 1992; 22: 42-46.
17. McCaffery M, Ferrell BR, O'Neil-Page E. Does life-style affect your pain-control decisions? *Nursing* 1992; 22: 58-61.
18. Watt-Watson JH. Nurses' knowledge of pain issues: a survey. *J Pain Symptom Manage* 1987; 2: 207-211.
19. Weis OF, Sriwatanakul K, Alloza JL, Weintraub M, Lasagna L. Attitudes of patients, housestaff, and nurses toward postoperative analgesic care. *Anesth Analg* 1983; 62: 70-74.
20. McCaffery M, Ferrell B, O'Neil-Page E, Lester M, Ferrell BN. Nurses' knowledge of opioid analgesic drugs and psychological dependence. *Cancer Nurs* 1990; 13: 21-27.
21. McCaffery M, Ferrell BR. Opioid analgesics: nurses' knowledge of doses and psychological dependence. *J Nurs Staff Dev* 1992; 8: 77-84.
22. McCaffery M, Ferrell BR. Understanding opioids and addiction. *Nursing* 1994; 24: 56-59.
23. American Pain Society. Principle of analgesic use in the treatment of acute pain and cancer pain. 3rd ed. Skokie (IL): American Pain Society; 1992.
24. Charap AD. The knowledge, attitudes, and experience of medical personnel treating pain in the terminally ill. *Mt Sinai J Med* 1978; 45: 561-580.