MEASURING PAIN AMONG CRITICALLY ILL-INTUBATED PATIENTS: A CASE STUDY

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ABSTRACK

BACKGROUND: As a subjective concept, pain can only defined by the individual who experiencing with it, and this symptom is commonly showed by a client's reaction to pain in intensely personal and account for the great variability from each person. Among critically ill-intubated patients, pain also being as the most common problem and more significance higher. This happen because the pain often under medicated in regard to routine procedures and treatments that must be taken for the critical patients. **PURPOSE:**This study aims to explore the pain management among critically-ill intubated patients in the Surgical Intensive Care Unit (SICU) and/or Surgical Respiratory Care Unit (SRCU), Songklanagarind Hospital, Hatyai, Thailand. **METHOD:**The study of subjects are critical care patients who administered with intubation and associated with a significant degree of pain in SICU and/or SRCU. There were 3 criterias used to collect the study subjects, included intubated patients, in medical or surgical intervention, and were able to be followed up for at least three days in ICU. There were two instruments that used in this study that consist of Demographic Data and Observational indicator, which includes vital signs, Face Rating Scale (FRS), and Critical-care Pain Observation Tool (CPOT). **RESULTS:** Three subjects were studied to examine their pain experiences. Some factors were founded has been influenced the level of pain among critically ill-intubated patients. These factors were included age, gender, following the surgical interventions, experiences with pain previously, fatigue, neurologic function, stress and coping mechanism, and performing nursing interventions such as endotracheal suction and mobilization/positioning. **CONCLUSION:**The problem of pain is more than the discomforting and it can be affected to the physical functioning and psychological problem to the patients. It is a reason that nurses should provide appropriate pain managements especially to caring the critical ill-intubated patients.

Keywords: Procedural pain, pain managements, critical care nurses, and critically-ill intubated patients, pain levels, factors influence of pain.

BACKGROUND AND SIGNIFICANCE OF THE PHENOMENA

Despite being one of the most commonly occurring symptoms in the medical world, pain was considered as one of the least understood symptom (Joy, 2009). As a subjective concept, pain can only defined by the individual experiencing the pain (Büyükyilmaz & AstI, 2009), and this symptom is commonly showed by a client's reaction to pain in intensely personal and account for the great variability from each person (Black & Hawks, 2005). Furthermore, until now pain has been being a problematical area in research and practice whether the pain management for the patients are deliver with properly, in particular those who admitted to the intensive care unit (ICU) (Cade, 2008).

The ICU was set up to handle the care of patients who suffering by complex problems and considered in a life threatening condition.

Among these patients, pain is considered as the most common problem for the critically ill patient (Ahlers et al., 2008). Approximately, one-half of critical patients recalled having had pain during care in the ICU (Mann, 2006). Moreover, pain is more significance higher and often under medicated because the routine procedures and treatment that must be taken for the critical patient (Young, Siffleet, Nikoletti, & Shaw, 2006). As a result, pain will produce a negative psychological and physiological consequences (Cade, 2008), and increase the risk for morbidity and mortality in critically ill patients if we're not taking care immediately (Ahlers et al., 2008).

In a study conducted by Puntillo (as cited in Shannon & Bucknall, 2003), it was found that approximately 2/3 of patient in ICU rated their pain as moderate to severe in

intensity and most of them showing their pain with eyes, or by leg movements or by reaching out for the nurse's arm. In another study by Stannard et al. (1996) as cited in Aslan, Badir and Selimen (2003) noted that although nurses did administer the prescribed analgesics, patients still complained of unsuccessful pain control. This evidence shown the importance to assess the level of pain, in particular by critical care nurse in the ICU in order to deliver appropriate pain management among critically ill patients (Shannon & Bucknall, 2003).

Furthermore, an increased focus on pain management programs and the development of new standards for pain management are moving forward now (Ene, Nordberg, Johansson, & Sjostrom, 2006), but the effectiveness of pain management for the critically ill-intubated patient as an important stressor for critical care patients in the ICU (Cade, 2008) still faced a number of barriers. These barriers including patient's ability to communicate verbally (Ahlers et al., 2008; Gelinas, Fillion, Puntillo, Viens, & Fortier, 2006; Herr et al., 2006), technology, knowledge and time constraints (Shannon & Bucknall, 2003).

Based on the several reasons above, pain is considered as an important problem in critical care patients. It's mean that pain management among these patient must be in a priority to be solved (Gelinas, Fortier, Viens, Fillion, & Puntillo, 2004). In order to develop the effective pain management in critical ill-intubated patient, the appropriate pain assessment must be adequately covered by the nurses (Gelinas et al., 2006), by interpreting any important sign and symptom through to their senses of observation, hearing and touch (Aslan, Badir, & Selimen, 2003).

This study aims to explore the pain management among critically-ill intubated patient. Therefore, the specific objectives of the study are to: (1) Describe pain experience in critically ill-intubated patients, (2) Identify the influencing factor of pain among critically ill-intubated patients.

METHODS

The study subjects are critical care patients who administered with intubation and associated with a significant degree of pain. They were hospitalized in the Surgical Intensive Care Unit (SICU) and/or Surgical Respiratory Care Unit (SRCU). Moreover, the criteria case selection that required involving in this study includes: (1) Male and female patients who got intubation, (2) Have either medical or surgical interventions, (3) Able to follow up for at least three days in ICU.

Data collection tools were used in this study consists of (1) Demographic Data and (2) Observational indicator, which includes vital signs, Face Rating Scale (FRS), and Critical-care Pain Observation Tool (CPOT). Demographic data consist of 12 items, which utilize to collect the subject demographic data including age, gender, marital status, educational level, religion, medical diagnosis, type of operation and etc. Moreover, the pain level were measured by using physiological indicator that includes blood pressure, heart rate, and respiratory rate. While, behavioral indicators was measured by using FRS and CPOT to determine the level of pain in critically ill-intubated patients who could not provide self-report regarding their pain experiences. The higher score reflects to the higher perceived of pain that felt by the subjects.

Data collection technique is based on nursing process, started from assessment, data analyzing, planning, implementation, and evaluation. In the assessment part, the information for demographic data were collected by interview method to the family, conducted physical examination to the patient, sought from hospital information system (via computer), and patient's medical record. Then, continued with measuring pain level by using that instruments that have been developed based on physiological and behavioral indicators to determine patients pain levels.

The obtaining data analyzed by using mind mapping technique to develop nursing diagnosis related to patient problems. Furthermore, the nurse plans for intervention based on developing map to provide holistic care and find appropriate pain intervention which suitable for patients. In term of reducing pain, the nurse offered massage

therapy and therapeutic touch technique to the patients as complimentary therapies.

No	Data	Patient 1 (Mr. CK)	Patient 2 (Mrs. AC)	Patient 3 (Mr. SK)
1	Age	86	50	68
2	Gender	Male	Female	Male
3	Marital status	Married	Married	Married
4	Religion	Buddhism	Buddhism	Buddhism
5	Medical Diagnosis	Acute Arterial Occlusion	Aortic (valve) insufficiency	Leiomyosarcoma of liver with lung metastasis
6	Type of operation	No surgery	Bentall operation with mitral valve replacement	Right lobe hepatectomy and diaphragm resection and primary repair
7	Previous history of hospitalization	Bilateral renal stenosis Myocardial Infarction (NSTEMI) DVT in right thigh (July 2008)	Congestive heart failure	Right lobe liver mass resection on August 4, 2009
8	Duration of intubation	28 days	1 day	14 days
9	Cigarette smoking	-	-	√

The pain assessment was conducted for three times before intervention, during procedural intervention, and after administered by pain medication. In addition, during procedural intervention, the nurse also performed nursing intervention in order to relieve pain in patients. Each patient was administered with an intervention to be implemented for at least 10-15 minutes during any nursing intervention that provokes to develop significant pain. After the implementation, the nurses did the reassessment the level of pain by using same instruments to evaluate whether this intervention is effective or not to relieve pain that felt by the patients.

The level of pain in critical patients were measured by following the factor that related to pain in critically ill intubated such as endotracheal suctioning, positioning and/or mobilization. Detail of patient's pain experiences were described on chart below

STUDY FINDINGS

From the initial assessment by using the instruments, observation, and patient's medical record, the completed profile of each subject was described in table (see Table 1)

Table 1
Subject profile

Nursing Intervention	Patient 1	Patient 2	Patient 3
Tracheal suctioning	√ (as needed)	√ (as needed)	√ (as needed)
Positioning/mobilization	√ (every 2 hours)	√ (every 2 hours)	√ (every 2 hours)

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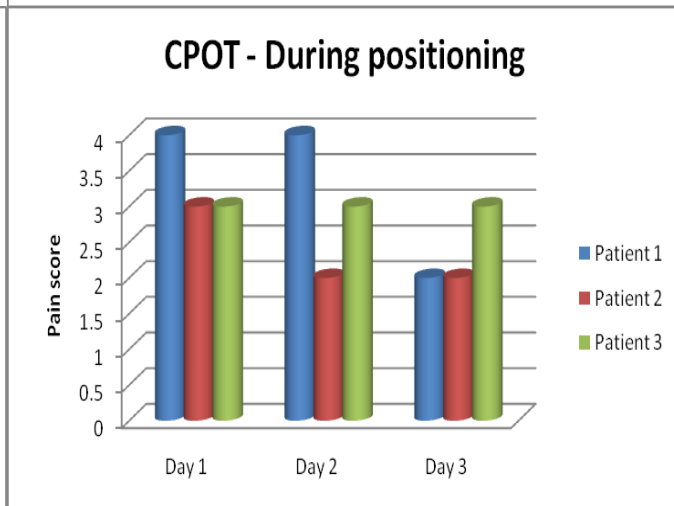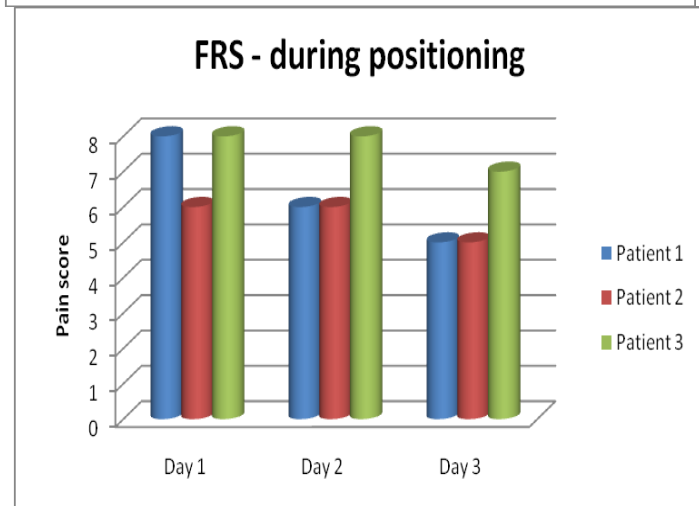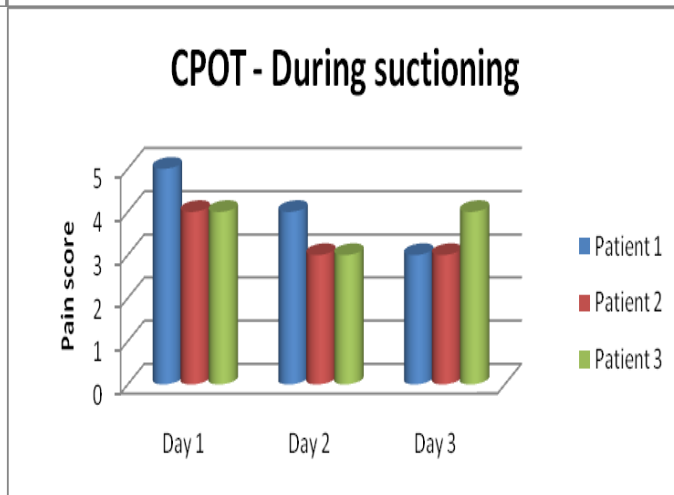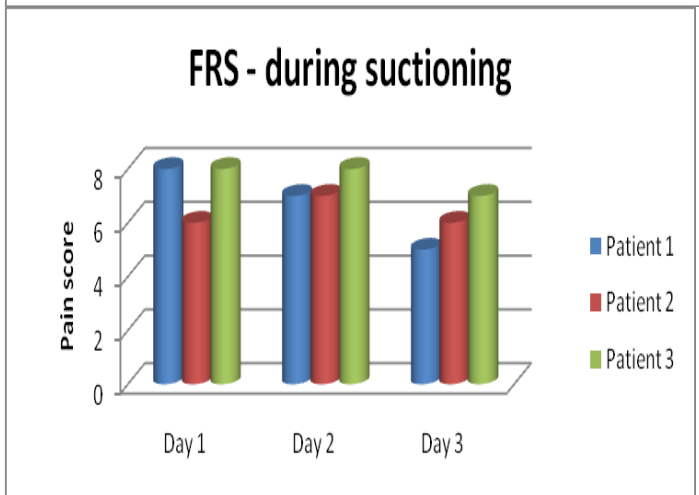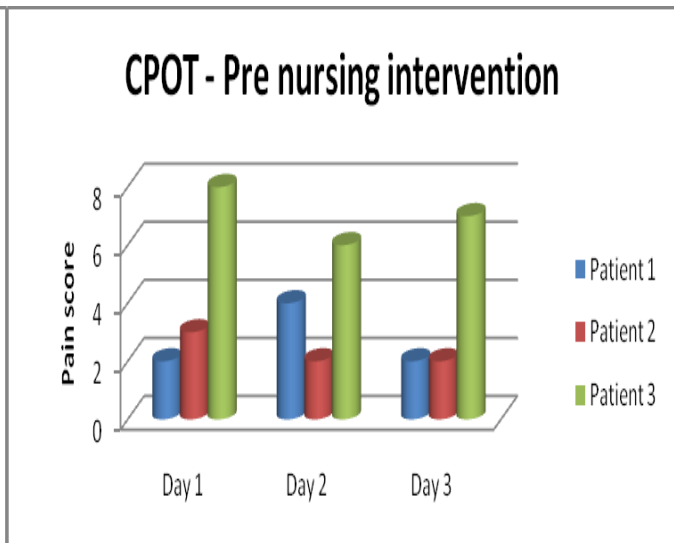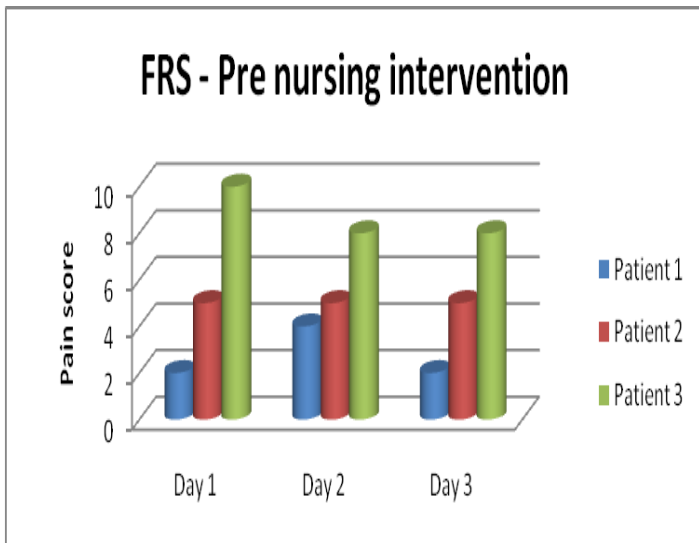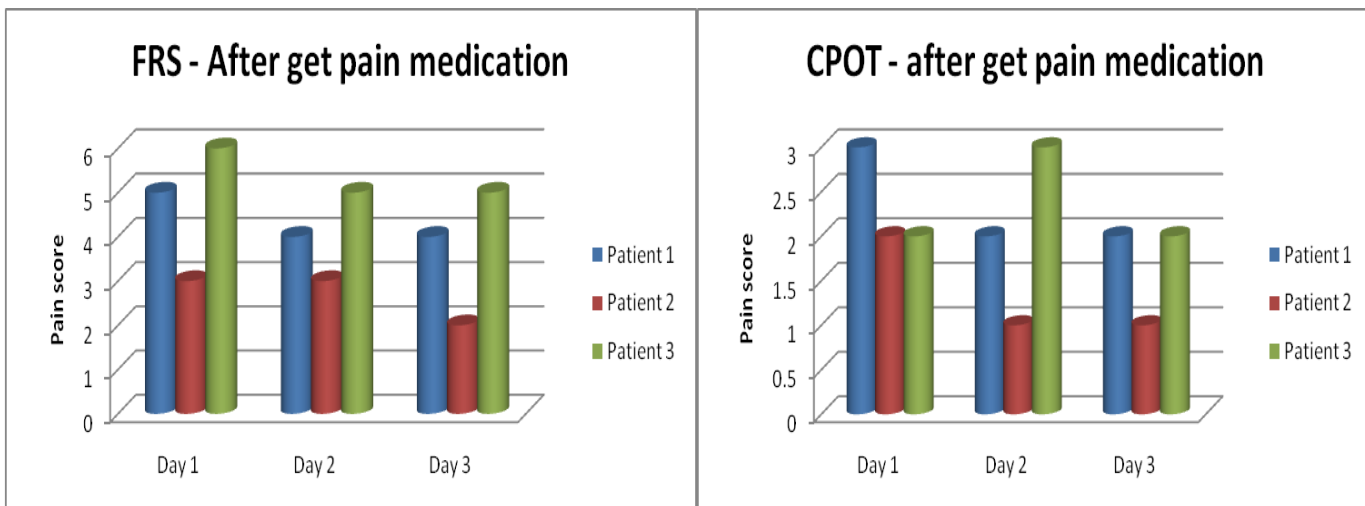
*Pain Influencing Factors among Critically Ill-Intubated Patients*Influencing factors to pain for each subject is described and summarized in table (see Table 2).

Table 2
Influencing Factors for Pain in Critically Ill-Intubated Patient

Patient 1	Patient 2	Patient 3
( ) Age	(√) Age	(√) Age
( ) Gender	(√) Gender	( ) Gender
( ) Following the surgical intervention	(√) Following the surgical intervention	(√) Following the surgical intervention
( ) Experiences with pain previously	( ) Experiences with pain previously	(√) Experiences with pain previously
( ) Fatigue	(√) Fatigue	(√) Fatigue
(√) Neurologic function	( ) Neurologic function	( ) Neurologic function
( ) Stress and coping mechanism	( ) Stress and coping mechanism	(√) Stress and coping mechanism
(√) Endotracheal suction	(√) Endotracheal suction	(√) Endotracheal suction
(√) Mobilization/positioning	(√) Mobilization/positioning	(√) Mobilization/positioning
( ) Wound dressing	( ) Wound dressing	( ) Wound dressing

DISCUSSION

Based on three cases that describe above, some factors have influenced level of pain among those patients include age, gender, following the surgical intervention, experiences with pain previously, fatigue, neurologic function, stress and coping mechanism, and performing nursing intervention such as endotracheal suction and mobilization/positioning.

Age, initially this factor of ages will affects to the way of people respond to pain, whereas increasing age is a risk factor to develop further pain. According to Hamilton (2007), aging will affects the whole body, causing many painful degenerative disorders (such as osteoarthritis), secondary injuries (such as skin abrasions and fractures), and a host of common surgical procedures. It is can be shown at the third patient that has severe pain compare with the second patient. However, this factor was not influence the first patient. Even though his age categorized as very old man, but his now on limited neurological function. Whereas, this factor affecting to depress the *functioning of the central nervous system* that is precipitate to decreasing the sensitivity and perception to touch and pain, but it can render affected individuals more vulnerable to injury.

Furthermore, from previous study gender is most likely affected level of pain. It has been postulated that education traditionally stimulates boys not to express pain, while girls may be more fragile and sensitive when they experience with pain. But, previous studies reported there is no significant differences between males and females concerning analgesic requirements. It is more likely depend on type of surgical intervention that they follow and size of surgical wound that presenting after the surgery (Mamie et al., 2004).

Another factor that related to pain levels from the cases is memory of painful experiences. Experiences of pain previously is considered will be increased the sensitivity and decrease tolerance to pain. This condition may be due to the anticipation and fear of a specific painful event (Hamilton, 2007). Based on the case, the patient 3 had same surgical procedure before, and it would precipitate to develop higher pain levels to the patient. However, earlier pain experience also can allows someone to adopt the coping mechanism that may or may not be used with subsequent episodes with pain (Black & Hawks, 2005).

On the other hand, fatigue also considered as the cause of significant pain level especially in patient 2 and 3. Fatigue can decrease the coping abilities and heightens the perception of pain (Hamilton, 2007). From this, both patients are looking exhausted from physical activity, stress, and lack of sleep (sleep disturbance) that makes their pain perception is heightened. Therefore, both of patients prescribe by sedative (Dormicum) drug to provide rest

from physical, emotional, and social demands and generate enough time for sleep in order to relieve pain.

However, among those three patients, the factor that more influence for higher pain levels is the performing nursing intervention in order to taking care of patient. According to Puntillo et al., (2004) and Arroyo-Novoa et al. (2008), they addressed the common nursing procedure which can produce significant pain intensity among critically ill patient includes tracheal suctioning, turning position/mobilization, central venous catheter insertion, wound drain removal, wound dressing change, placement of a central venous catheter, and femoral catheter removal. From this, nurses only can observe the procedural pain from endotracheal suction and turning position/mobilization due to the limitation of practice time (only in morning shift).

The presence of pain during tracheal suctioning has been generated significant pain level (moderate to severe) among these three patients. This finding also supported by Payen et al. (2001) which stated among critically ill-intubated patients, the endotracheal suctioning were the most important factors that worried patients during their ICU stay. In addition, Arroyo-Novoa et al. (2008) stated that more than 30% from 57 patients was recalled the endotracheal suction as the discomforting intervention. Thus, it is clearly show that among these three patients, all of them were affected with significant procedural pain level from suctioning intervention.

In addition, turning position or patient's mobilization also increased pain level to the patients. Initially, positioning the intensive care ventilated patients can improve patient comfort and address the physiological aims of optimizing oxygen transport (through the effects of improving ventilation/perfusion mismatching), reducing the work of breathing and reducing myocardial workload (Coyer, Wheeler, Wetzig, & Couchman, 2007). However, during this procedure all patient show the painful character such as increased heart rate and blood pressure (Hamill-Ruth & Marohn, 1999). When compared among all patients, the third patient appears more suffered by pain even though he already administer by breakthrough pain drug than

others. This problem may be related to his previous experiences with the surgical intervention, fatigue due to stress and lack of sleep, and disease complication in the patient.

Recommendation.

The useful of CPOT tool to be implemented in verbalize patients and incommunicative patients, makes this tool is recommended to be applied as the common pain assessment tools in critically ill-intubated and unconscious adult patients (Li, Puntillo, & Miaskowski, 2008). CPOT also has been validated with a hundred sixty patients in various diagnoses (trauma, surgical, or medical), including patients who able to self-report or not (Gelinas et al., 2006; Gélinas & Johnston, 2007). Thus, this assessment tool is considered can be useful for assessing pain in clinical practice on Surgical Intensive Care Unit (SICU) and Surgical Respiratory Care Unit (SRCU) wards.

Moreover, during practices in the SICU and SRCU, nurses in the wards were still determining pain score by asking directly to the patients regarding their pain severity and intensity. As a result, some unconscious and incommunicative patient, even non-verbally cannot be assessed. It is showed from hospital information system (via computer) whereas there is no data regarding pain level among this patient at all. However, when patients on agitation or incompliance with his or her own condition, the doctor has prescribed breakthrough pain medication such as Morphine and Dormicum. From this, we can assume if the patients were in the higher problem with pain. Therefore, both ICU wards are recommended to have standard pain assessment tool by observing patient behavioral activity such as CPOT or other related tool in order to obtain reliable data regarding pain experiences in critically ill-intubated patients.

When practicing CPOT in critically ill-intubated patients, the nurse still faced the difficulty to assess indicator "patient compliance with the ventilator". Even though when the nurse observed patient in severe pain, but the mechanical ventilator alarm was not directly activated like the direction that stated on the assessment tool.

Only, patient 3 that nurse observed has precipitated the mechanical ventilation (MV) alarm due to severity pain that he felt and looked at inconvenience with MV. In addition, during clinical practice, the nurse only measured the level of pain on rest time and during nursing intervention (endotracheal suctioning and positioning). Also, the number of measurement time was only on single time without see the average of pain levels for one full day. However, the nurses have found the similar result with study that conducted by Gélinas, Harel, Fillion, Puntillo and Johnston(2009), whereas the higher CPOT scores were obtained with a nociceptive procedure (turning with or without suctioning) compared with rest or a nonnociceptive procedure (noninvasive blood pressure).

CONCLUSION & RECOMENDATION

The problem of pain is more than the discomforting and it can be affected to the physical functioning and psychological problems to the patients. It is a reason that the nurses should provide appropriate pain management among critical care patients. The effectiveness of pain management is started from proper assessment throughout the patient. Initially, for patient who unable to provide self report, behavioral and physiological indicators are commonly use to determine pain levels among critically ill-intubated patients. From clinical nurses have also found several influencing factors to the severity of pain among critically ill-intubated patients including age, gender, following the surgical intervention, experiences with pain previously, fatigue, neurologic function, stress and coping mechanism, and performing nursing intervention such as endotracheal suction and mobilization/positioning.

In order to relieve pain, primary intervention by using medications such as analgesic and sedatives has been being a common procedure in critical care setting. As a professional, the nurses are also responsible to provide additional intervention by combining the medication with other complementary therapy such as therapeutic touch and massage therapy. These interventions have been proven will improve the comfort and reduce anxiety that will be affected to relieving of pain.

Furthermore, the levels of pain not only depending on the clinical factor such as the medical diagnosis and surgical intervention, but also it are affecting by nursing intervention. Thus, the nurses should be more concerned and assessed all those factors by using appropriate instruments to obtain related data that significantly to reduce the levels of pain.

REFERENCE

Ahlers, S., Van Gulik, L., Van Der Veen, A., Van Dongen, H., Bruins, P., Belitser, S., et al., (2008). Comparison of different pain scoring systems in critically ill patients in a general ICU. *Critical Care, 12*, 1-8.

Arroyo-Novoa, C., M., Figueroa-Ramos, M., I., Puntillo, K., A., Stanik-Hutt, J., Thompson, C., L., White, C., et al., (2008). Pain related to tracheal suctioning in awake acutely and critically ill adults: A descriptive study. *Intensive and Critical Care Nursing, 24*, 20-27.

Aslan, F., E., Badir, A., & Selimen, D., (2003). How do intensive care nurses assess patients' pain? *Nursing in Critical Care, 8*, 62-67.

Black, J., M., & Hawks, J., H., (2005). *Medical surgical nursing: Clinical management for positive outcomes* (7 ed. Vol. 1): Elsevier Inc.

Büyükyilmaz, F., E., & AstI, T., (2009). Postoperative pain characteristics in Turkish orthopedic patients. *Pain Management Nursing, In Press, Corrected Proof*, 1-9.

Cade, C., H., (2008). Clinical tools for the assessment of pain in sedated critically ill adults. *Nursing in Critical Care, 13*, 288-97.

Coyer, F., M., Wheeler, M., K., Wetzig, S., M., & Couchman, B., A., (2007). Nursing care of the mechanically ventilated patient: What does the

evidence say?: Part two. *Intensive and Critical Care Nursing, 23*, 71-80.

Ene, K., Nordberg, G., Johansson, F., & Sjostrom, B., (2006). Pain, psychological distress and health-related quality of life at baseline and 3 months after radical prostatectomy. *BMC Nursing, 5*, 1-7.

Gelinas, C., Fillion, L., Puntillo, K., A., Viens, C., & Fortier, M., (2006). Validation of the critical-care pain observation tool in adult patients. *American Journal of Critical Care, 15*, 420-27.

Gelinas, C., Fortier, M., Viens, C., Fillion, L., & Puntillo, K., (2004). Pain assessment and management in critically ill intubated patients: A retrospective study. *American Journal of Critical Care, 13*, 126-36.

Gélinas, C., Harel, F., Fillion, L., Puntillo, K., A., & Johnston, C., C., (2009). Sensitivity and specificity of the critical-care pain observation tool for the detection of pain in intubated adults after cardiac surgery. *Journal of Pain and Symptom Management, 37*, 58-67.

Gélinas, C., & Johnston, C., (2007). Pain assessment in the critically ill ventilated adult: Validation of the critical-care pain observation tool and physiologic indicators. *The Clinical Journal of Pain, 23*, 497-505.

Hamill-Ruth, R., J., & Marohn, M., L., (1999). Evaluation of pain in the critically ill patient. *Critical Care Clinic, 15*, 35-54.

Hamilton, P., M., (2007). Pain and pain management. Retrieved December 3, 2009, from http://www.nursingceu.com/courses/2 14/index_nceu.html.

Herr, K., Coyne, P., J., Key, T., Manworren, R., McCaffery, M., Merkel, S., et al., (2006). Pain assessment in the nonverbal patient: Position statement with clinical practice recommendations. *Pain Management Nursing, 7*, 44-52.

Joy, S., (2009). Pain: Nursing Implications. Retrieved February 10, 2010, from http://currentnursing.com/reviews/pai n_nursing_care.htm.

Li, D., Puntillo, K., & Miaskowski, C., (2008). A review of objective pain measures for use with critical care adult patients unable to self-report. *The Journal of Pain, 9*, 2-10.

Mamie, C., Bernstein, M., Morabia, A., Klopfenstein, C., E., Sloutskis, D., & Forster, A., (2004). Are there reliable predictors of postoperative pain? *Acta Anaesthesiologica Scandinavia 48*, 234-42.

Mann, A., R., (2006). Manage the power of pain. *Men in Nursing Journal*, 21-28.

Payen, J., F., Bru, O., Bosson, J., L., Lagrasta, A., Novel, E., Deschaux, I., et al., (2001). Assessing pain in critically ill sedated patients by using a behavioral. pain scale. *Critical Care Medicine, 29*, 2258-63.

Shannon, K., & Bucknall, T., (2003). Pain assessment in critical care: what have we learnt from research. *Intensive and Critical Care Nursing, 19*, 154-62.

Young, J., Siffleet, J., Nikoletti, S., & Shaw, T., (2006). Use of a behavioural pain scale to assess pain in ventilated, unconscious and/or sedated patients. *Intensive and Critical Care Nursing, 22*, 32-39.