Knowledge and Attitudes of Nurses and Their Practices Regarding Post-operative Pain Management in Bangladesh

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ABSTRACT

Numerous studies revealed that the prevalence of pain remains high in post-operative patients. Little is known about the knowledge and attitudes level of Bangladeshi nurses and their practices in post-operative pain management. This study aimed to examine the level of knowledge and attitudes of nurses and their practices, and to examine the relationship between knowledge and attitudes of nurses and their practices regarding post-operative pain management. Initially, one hundred nurses were selected by using the simple random sampling from two hospitals in Bangladesh. The instruments were divided into three parts. Part one was the Nurses' Demographic Data Form; Part two was the Knowledge and Attitudes of Nurses Regarding Post-operative Pain Management Questionnaire and Part three was the Nurses' Caring Behavior Regarding Post-operative Pain Management Questionnaire. The questionnaires were content validated by three experts, and back-translated to the Bengali language. The questionnaires used in the study were reliable with test-retest reliability coefficient of .72 for the knowledge and attitudes questionnaire, and .87 for the practice questionnaire. There were 88 returned questionnaires and 87 questionnaires were used in the data analysis.

The findings indicated that nurses had very low level of knowledge and negative attitudes in post-operative pain management whereas the level of practice was moderate. There was no statistically significant relationship between knowledge and attitudes of nurses and overall pain management practices ($r = .16$, $p > .05$). Regarding the relationship between knowledge and attitudes and the pain management practices subscales, there were also no significant relationships between knowledge and attitudes of nurses and their pain assessment-evaluation, as well as their knowledge and attitudes and pain intervention. The findings indicate that there is an urgent need to improve the knowledge and attitudes of nurses and their practices regarding post-operative pain management in Bangladesh.

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CHAPTER 1

INTRODUCTION

Background and Significance of the Problem

Pain is a common problem encountered by hospitalized patients in general and surgical settings in particular. Numerous studies have revealed that the prevalence of pain remains high in post-operative patients (Apfelbaum, Chen, Mehta, & Gan, 2003; Moss, Taverner, Norton, Lesser, & Cole, 2005; Yates et al., 1998). Yates et al. reported that 79% of surgical patients experienced a great intensity of pain during the first 24 hours after surgery. Ignatavicius and Workman (2002) reported that for patients who underwent surgery, 20% of them experienced mild pain, 20% to 40% experienced moderate pain, and 40% to 70% experienced severe pain. Apfelbaum et al. (2003) found that approximately 80 % of patients described their pain as moderate, severe, or extremely severe. Similarly a research conducted in United Kingdom showed that 60% of patients had pain score of 5 or more out of 10 on movement at 24 hours post surgery. Their post-operative pain experiences resulted in post-operative complications (Moss et al., 2005).

Unrelieved pain from post surgical interventions has devastating physiological, psychological, and socio-economic effects. Physical pain is related to impaired respiration, disturbances in sleep and appetite, immobility (Chung & Lui, 2003), and delayed wound healing (Bardiau, Taviaux, Albert, Boogaerts, & Stadler, 2003; Sherwood, McNeil, Starck, & Disnard, 2003). Psychological pain is associated with anxiety, depression, and hostility (Cadden, 2007). Unrelieved pain is a symptom that

delays discharge of the patient from hospital and is commonly related to hospital re-admission and thus increases health care costs (Huang, Cunningham, Laurito, Chen, 2001; MacLellan, 2004). As a result, the increased physical and financial dependency may lead to behavioral and communication changes, which may result in deterioration of the family system (Al-Hassan, Alkhalil, & Ma'aitah, 1999). Ultimately it can contribute to a decrease in quality of life (Kubecka, Simon, & Boettcher, 1996; Richards & Hubbert, 2007). The nurse is one of the health professionals, who operates in close proximity with the patients in post-operative recovery units and thus has a significant professional responsibility on alleviation of post-operative pain (Field, 1996).

In providing the effective pain relief and quality of patient care, nurses should have accurate knowledge and positive attitudes, and skills which are critical in assessment and management of post-operative pain (Al-Hassan et al., 1999). In the past few decades, numerous studies have shown that the nurses had knowledge deficits and negative attitudes in many areas related to post-operative pain assessment and management (Coulling, 2005; Lloyd, 1994; Mackintosh, 2007; Naser, 2005; Sheidler, McGuire, & Gilbert, 1989). The significant areas included opioid analgesics, routes of administration, adjuvant medications, and incidence of addiction (Kubecka et al., 1996).

Several studies have shown that nurses' negative attitudes hampered effective pain management. The common causes reflecting these attitudes include fear of addiction, tolerance to opioids, and respiratory depression (Broekmans, Vanderschueren, Morlion, Kumar, & Evers, 2004; McCaffery & Ferrell, 1997; Patiraki et al., 2006). Some nurses are reluctant to administer opioids due to their

negative attitudes. One of four nurses is waiting to administer opioids until the patient reports severe pain (McCaffery & Ferrell). Patiraki et al. reported that lack of education, misconception about pain, and limitations in nurse-patient relationship led to negative attitudes.

Nurses' lack of knowledge and negative attitudes towards pain and its management can significantly contribute to an inaccurate pain assessment (Nash, Edwards, & Nebauer, 1993). Several studies confirmed that patients' self-report is the most reliable assessment of describing their pain (McCaffery & Ferrell, 1997; Novy & Jagmin, 1997). Unfortunately, many nurses used patients' observable behavior as an indicator of pain (Calvillo & Flaskerub, 1993; McCaffery, Ferrell, O'Neil-Page, Lester, & Ferrell, 1990). This practice may be due to their reluctance to believe in what their patients have told them.

Many factors may contribute to nurses' lack of knowledge and negative attitudes towards pain in Bangladesh context. Firstly, the basic nursing education in Bangladesh is diploma level where nurses have been trained to perform task-oriented function. This would make nurses pay more focus on assigned tasks rather than on patient's concerns or problems, including pain. Secondly, pain topic had never been included in the nursing curricula until recently when the nursing curricula have been revised for the diploma level and newly established for the baccalaureate level, in which the pain concept has been introduced to nursing students since 2008. Unfortunately, all nurses currently provide care to patients in pain in the healthcare settings have no formal education regarding this topic. Thirdly, there is no provision in providing in-service education on pain topic as it may not be considered important compared to other topics, such as hospital-acquired infection, care for HIV/AIDS

patients etc. (W. Petpichetchian, WHO consultant, personal communication, September 5, 2009). This information implies that nurses in Bangladesh may have very limited knowledge on this matter.

Lastly, the authoritative relationship between nurses and patients may contribute to nurses' attitudes towards their patients in pain. According to Pearson (1999), Bangladesh has a very hierarchical society and most professionals are from upper class urban backgrounds. Cultural traditions of patronage mean that many service providers have little knowledge of the needs of their clients, particularly the poor. With this tradition, Bangladeshi nurses may not try to understand their patients and the nurses believe in what they think rather than believing in what the patients say. This is evident by the researcher's personal experience working in a surgical ward. Nurses seem to be reluctant to respond to patients in pain, reflecting their attitudes. They sometimes use incorrect judgment. For example, if the patient reports pain but looks fine in their facial expression (e.g., smile), nurses seem to believe that the patient has no pain and no action is made to help relieve the pain. The lack of knowledge and negative attitudes contribute to nurses' practice in pain assessment and evaluation and in pain intervention given to their patients, particularly pharmacological intervention and non-pharmacological intervention.

Pain assessment and evaluation or reassessment has not been routinely performed by nurses. A recent retrospective study of Abdalrahim, Majali, and Bergbom (2008) demonstrated that there was no evidence of pain assessment documented on the first day of surgery in 35% of patients' records. In those records, pain location was the most recorded information found in 61% of notes, and only 4.3% of nurses used a pain scale. Nurses' reassessment after giving analgesic

administration to post-operative patients was very low (Bucknall, Manias, & Botti, 2007). Lack of patients' post-operative pain assessment, reassessment, and documentation by nurses could hamper effective pain management.

Moreover, many studies indicate that the nurses tend to under administer analgesics and had conflicts when they administer opioid. One study found that only 22.3% of patients received around-the-clock administration of analgesics during the first 24 hours for hip fracture and nurses reported difficulty contacting physicians and difficulty communicating with them about type and/ or dose of analgesics (Titler et al., 2007). Another study found that on the first post-operative day, nurses administered very less analgesics than pro-re-nata (PRN) schedule (Gillies, Smith, & Patty-Jone, 1999).

To reduce adverse effect of analgesia and ensure that adequate pain relief has been achieved, and offer the patients a sense of control over the situation; non-pharmacological methods are accepted as additional strategies that may be used independently or in addition to medication (Caty, Tourigny, & Koren, 1995; He, Polkki, Vehvilainen-Julkunen, & Pietila, 2005). Based on the researcher's experience, there is no practice/use of any non-pharmacological methods to reduce pain in Bangladesh.

Literature reviewed above was conducted in several countries. Little is known about the level of knowledge and attitudes of Bangladeshi nurses and their practices in post-operative pain management, where the effort and information to guide health care providers to focus on such practice has been given importance. Coyne et al. (1999) stated that different educational backgrounds of nurses might be the main factor influencing nurses' pain management practice. In Bangladesh, as mentioned

earlier, nurses do not receive any kind of formal education and training to prepare them to help contribute to effective pain management. Bangladeshi nurses have gained knowledge, developed attitudes and experiences through their clinical exposure to patients suffering from pain only. Therefore, it is worthwhile to investigate the knowledge and attitudes of Bangladeshi nurses and their practice about post-operative pain management. The finding from this study would provide baseline information for further improvement in pain area.

Objectives of the Study

The objectives of this study are:

1. To examine the level of knowledge and attitudes of nurses regarding post-operative pain management

2. To examine the level of practices of nurses regarding post-operative pain management

3. To examine the relationship between knowledge and attitudes of nurses and their practices regarding post-operative pain management

Research Questions

The research questions are as follows:

1. What is the level of knowledge and attitudes of nurses regarding post-operative pain management?

2. What is the level of practices of nurses regarding post-operative pain management?

3. Is there any relationship between knowledge and attitudes of nurses and their practices regarding post-operative pain management?

Conceptual Framework of the Study

The researcher employed the knowledge-attitude-practice (KAP) model and knowledge from pain literature to guide the conceptual framework for this study. The KAP model was first used in the field of family planning and population studies in the 1950s (Launiala, 2009). The model suggests that the right information (knowledge) would influence attitudes, and thus change behavior (practice). It has been used to guide health education programs. However, it has been criticized throughout the years that the relationships among knowledge, attitudes, and practice may not be simple. For example, changing knowledge and attitudes does not seem to guarantee a change in behavior. It is also known that changes in behavior may bring about changes in knowledge and attitudes of the nurses (Kiger, 2004).

The KAP model has been used to investigate health behaviors e.g., birth control, safe sex as well as health-seeking practices, e.g., breast cancer screening (Odusanya & Tayo, 2001) or cervical cancer screening (Dhamija, Sehgal, Luthra, & Sehgal, 1993). It has also been expanded to investigate behaviors of health care providers. The recent study used the KAP model to explore nurses' KAP related to research (Witzke et al., 2008). In an area of pain and its management, the KAP model has been widely used to explore the knowledge, attitudes and practices of nurses (Brown, Bowman, & Eason, 1999; Clarke et al., 1996; Matthews & Malcolm, 2007).

The core elements of knowledge, attitudes, and practices regarding post-operative pain and its management that nurses should possess include general concept of pain;

pain assessment and evaluation; pain management, particularly use of analgesics and non-pharmacological methods. Since knowledge and attitudes are concepts that have an intertwined correlation, it is more helpful to avoid distinguishing them (Ferrell & McCaffery, 2008). Thus, in this study, knowledge and attitudes of nurses was treated as a single variable, namely knowledge and attitudes of nurses regarding post-operative pain management. Knowledge and attitudes of the nurses was expected to have an intertwined relationship with practices of nurses as mentioned earlier. Therefore, a bidirectional relationship between these two variables was examined in this study.

Hypothesis

There is a positive relationship between knowledge and attitudes of nurses and their practices regarding post-operative pain management.

Definition of Terms

Knowledge and attitudes of nurses regarding post-operative pain management was defined as nurses' understanding and valuing about post-operative pain, assessment, evaluation, and management of post-operative pain including both pharmacological and non-pharmacological management. The knowledge and attitudes of nurses regarding post-operative pain management was measured by using the Nurses' Knowledge and Attitudes Regarding Post-operative Pain Management Questionnaire (NKAPQ) which was modified by the researcher from Ferrell and McCaffery's Nurses' Knowledge and Attitudes Survey Regarding Pain Questionnaire (2008). The higher scores indicated the higher level of knowledge and positive attitudes of nurses toward post-operative pain management.

Practices of nurses regarding post-operative pain management was defined as nurses' perception of their own nursing actions performed to reduce the post-operative pain. These include pain assessment, evaluation, and management including both pharmacological and non-pharmacological management for post-operative patients. Practices of nurses regarding post-operative pain was measured by using the Nurses' Caring Behavior Regarding Post-operative Pain Management Questionnaire (NCBPQ) (Erniyati, 2002). The higher scores indicated that the more actions nurses performed to reduce the post-operative pain.

Significance of the Study

This study would provide the following information needed to improve the knowledge and attitudes of nurses and their practice in pain management.

1. Provide critical information for development of knowledge and attitudes of nursing staff and management of nursing practice for post-operative patients.

2. Offer a baseline data for further development of research on issue related to the effective post-operative pain management.

3. Guide nursing curriculum and training toward an appropriate body of knowledge and practice in post-operative pain management.

CHAPTER 2

LITERATURE REVIEW

The literature review in this study covers the concept of pain and post-operative pain, pain assessment, post-operative pain management and barriers to effective pain management. Knowledge and attitudes of nurses and their practices regarding post-operative pain management was also reviewed.

Concept of Pain and Post-operative Pain

Definition of pain and post-operative pain

According to McCaffery (1979) pain is "whatever the experiencing person says it is and exists whenever he/she says it does" (p. 11). Pain is perceived to be a protective mechanism for the body. It occurs when tissues are being damaged (Guyton, 1991). Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (Merskey et al., 1979). Indeed pain is the number one symptom or complaint that causes people to seek health care (Shorten et al., 2006).

Pain has been classified into two types, acute pain and chronic pain. Acute pain usually lasts for a short period of time (less than three to six months) and is associated with tissue injury and inflammation (Cadden, 2007). Acute pain is usually accompanied by physiological and behavioral responses of the patient. Physiological responses include increased high blood pressure, pulse rate, and respiratory rate. Behavioral responses include increased anxiety, sleep disturbances, restlessness,

irritability, aggression, and mobilization difficulties (Mackintosh, 2007). Chronic pain is a pain which lasts beyond the healing process and usually persists for more than six months. It may be continuous or intermittent and may or may not be associated with a chronic disease or injury (Cadden). There is no physiological response in chronic pain but behavioral responses are prominent particularly in those with long term pain (Mackintosh).

Post-operative pain is a result of chemical, thermal or mechanical stimulus associated with surgery and trauma (Coll, Ameen, & Mead, 2003). Post-surgical pain is a complex response to tissue trauma during surgery that stimulates hypersensitivity of the central nervous system. Post-operative pain can be felt after any surgical procedure, whether it is minor dental surgery or a triple-bypass heart operation. With this above description, post-operative pain forms one of the categories of acute pain.

Causes of post-operative pain

Any surgical procedures can be the cause of post-operative pain, as a result of tissue trauma to the area that was operated during surgery. Prior traumatic event, leading the patients' presence in the operating room, can also be the principal cause of tissue injuries and nerve injuries. The nerve injuries may contribute to the development of post-operative neuropathic pain (McCaffery & Beebe, 1994).

Pain theories and post-operative pain mechanism

According to a review of Alexander, Fawcett, and Runciman (1999), three ancient pain theories were addressed: the specificity theory, the pattern theory, and the affect theory. The specificity theory, postulated by the philosopher, Descartes (1596-

1650), posited that the existence of a specific pain system carries messages from pain receptors to the pain center in the brain. The pattern theory describes that any stimulus is capable of producing pain when it reaches sufficient intensity. The existence of specialized receptors and neurons is denied. The affect theory describes that pain is an emotion rather than a sensation. It is opposite of pleasure. Later, the gate control theory developed by Melzack and Wall was introduced in 1966. It is the most well-known theory that has been used to guide pain research for more than five decades.

The gate control theory explains the relationship between pain and emotion. It postulates that pain is not just a physiological response but has psychological responses, such as behavioral and emotional responses and can influence the perception of pain. Melzack and Wall (1966) also articulated the existence of a pain modulating system (as cited in Alexander, Fawcett, & Runciman, 1999). They explained that similar gating mechanisms exist in the descending nerve fibers from the thalamus and the cerebral cortex. These areas of the brain regulate a person's thought and emotions, including beliefs and values. When pain occurs, a person's thought and emotions can influence whether pain impulses reach the level of conscious awareness (Meinhart & McCaffery, 1983). In other words, thoughts (e.g. previous pain experience) and emotions (e.g. anxiety) can change (modulate) the perception of pain.

This theory offers that stimulation of the skin evokes nerve impulses that are then transmitted by three systems located in the spinal cord. The substantia gelatinosa in the dorsal horn, the dorsal column fibers, and the central transmission cells act to influence nociceptive impulses. The noxious impulses are influenced by a "gating mechanism" located in the spinal cord (Bare & Smeltzer, 2008). Pain impulses are

transmitted from the periphery of the body by nerve fibers (A delta and C fibers). The impulses travel to the dorsal horns of the spinal cord, especially to the area of the cord called the substantia gelatinosa. The cells of the substantia gelatinosa can inhibit or facilitate pain impulses that are transmitted to the trigger cells (T cells). When T cell activity is inhibited, the gate is closed and impulses are less likely to be transmitted to the brain. When the gate is opened, pain impulses ascend to the brain.

The above theories help explain pain mechanism in post-operative patients. The conception of the gate control theory has now expanded to include multiple mechanisms. For patients undergoing surgical procedures, skin and other tissues damage at the surgical sites, application of thermal and chemical stimuli to wound, and often prolonged traction to somatic and visceral structures activate the following processes: nociceptive transduction, sensitization of peripheral somatic and visceral nociceptive nerve terminals and central neurons, and loss of local and descending inhibition of neurons in the brain stem and spinal cord (Chaturvedi & Chaturvedi, 2007; Dirks, Moiniche, Hilsted, & Dahl, 2002).

Consequences of post-operative pain

Consequences of post-operative pain include unnecessary suffering, physical and psychosocial dysfunction, impaired recovery from acute illness and surgery, immunosuppression, and sleep disturbances. Unrelieved pain can result in increased morbidity, increased muscular contraction and spasm and also impaired cognitive function (Lewis, Heitkemper, Dirksen, O'Brien, & Bucher, 2007).

Post-operative pain can also result in negative impact on patient outcomes. In response to the stress of trauma and/ or the operative procedure, it raised the

catecholamine secretion and can lead to tachycardia, elevated blood pressure, peripheral vascular resistance, coagulation and associated myocardial oxygen consumption (Dunwoody, Krenzischek, Pasero, Rathmell, & Polomano, 2008). This consequence may result in left ventricular dysfunction, myocardial ischemia, or myocardial infarction. Post-operative pain with thoracic and abdominal splinting can impair respiratory excursions and inhibit coughing (Desai, 1999; Watson, 2002). Inadequate post-operative pain can delay return of normal gastrointestinal function, and increased autonomic activity. There is decreased mobilization of gastrointestinal smooth muscle, which can lead to gastric dilatation and also contribute to post-operative ileus in some patients (Stephens, Laskin, & Pashos, 2003). Increased autonomic outflow contributes to the post-operative urinary retention. Consequences of post-operative pain include the complications from venous thromboembolic disease and increase the risk of post-operative infection. It is also inhibiting the mobility that can result in the increased risk of venous thromboembolic disease, produce joint stiffness, delay rehabilitation, and prolong hospitalization (Lewis et al., 2007). Other hormones released in response to the stress of unrelieved pain include cortisol and glucagon. These hormones can lead to insulin resistance, hyperglycemia, alteration of protein and fat metabolism, and post-operative complications (Rosenfeld, Faraday, & Campbell, 1994). Unrelieved post-operative pain can cause impairments of the metabolic, hemodynamic, and homeostatic function that are more clinically observable (Lipman, as cited in Dunwoody et al., 2008).

Ineffective pain management effects on psychological consequences and patients become dissatisfied with the care of nurses. Patients with post-operative pain can be anxious, agitated, and unable to sleep well, and experience negative emotions.

Patients with stress in acute pain may develop hypercoagulability and impaired activity of both innate and adaptive immunity (Lipman, as cited in Dunwoody et al., 2008).

In summary, post-operative pain is a subjective concept, which can be perceived only by the individual experiencing it. There are several causes of post-operative pain. The common causes are tissue injuries and nerve injuries. Unrelieved post-operative pain contributes not only to post-operative discomfort, but also to post-operative complications, poor patient outcomes, post-operative morbidity and prolonged hospital stay, and psychological consequences (i.e., anxiety).

Pain Assessment

Principles of pain assessment

Pain is a subjective experience which is perceived directly only by the sufferer or the patient. It is a multidimensional phenomenon that can be described by pain location, intensity, temporal aspects, quality, impact and meaning. Pain does not occur in isolation but in a specific human being in psychological, economic, and cultural contexts that influences the meaning, experience and verbal and non-verbal expression of pain (Alexander, Fawcett, & Runciman, 1999). Therefore, there are multiple dimensions, which might be integrated to appropriate pain assessment.

Hinshaw, Feethaw, and Shaver (1999) described the six dimensions of pain. These are physiological, sensory, behavioral, cognitive, affective, and socio-cultural dimensions of pain. Each dimension is described as follows:

Physiological dimension. The pain is closely related to the physical function and some physical symptoms. The physiological dimension includes the location,

onset, duration, etiology, post-operative complications and associated symptoms are fatigue, anorexia, sleeplessness, constipation, and nausea that can be increased when pain is not controlled (Hinshaw et al., 1999).

Sensory dimension. The sensory dimension of post-operative pain is related to how the pain is actually felt by the individual who suffers from it (Ahles et al., as cited in McGuire, 1992). It includes post-operative pain intensity, quality, and pattern of the pain.

Behavioral dimension. The behavioral dimension of post-operative pain is related to the way the patient responds to pain. It consists of two components. The first component is the severity of pain which is commonly expressed by the following behaviors: grimacing, non-verbal vocalizations and communication with reporting to others. The second component is patients' behavior that the patient controls his/her pain, such as use of medications, positioning, sleep, work activity, and relationship with others.

Cognitive dimension. The cognitive dimension reflects how cognition plays a role in pain experience. It includes thought-provoking factors, such as the meaning of pain, the view of pain, previous therapy, attitudes and beliefs and prior exposure to pain and coping strategies.

Affective dimension. Affective dimension is related to how the patient feels or suffers in post-operative pain. It consists of mood of patient and includes anxiety, depression, anger, feeling of powerlessness, and emotional state of patient (McGuire, 1992).

Socio-cultural dimension. It includes the ethnic component, family, and social life work and home roles, recreation and leisure factors and social behaviors, and activities around the patient (Hinshaw et al., 1999).

Pain assessment tools

Several reliable and valid measures are available to assess pain. There are two types of assessment tools used to assess pain. These are unidimensional scales and multidimensional scales. The unidimensional scales can be used to measure one component of the pain experience (e.g., pain severity) and the multidimensional pain tools can capture several aspects of pain, such as quality and character of pain (onset, duration, location, pattern of pain and associated symptoms), and impact of pain on various indicators (e.g., activity, mood, sleep, nutrition) (Dunwoody et al., 2008). Although pain has multiple dimensions, unidimensional pain assessment is recommended that it is an easy technique to identify the patient's pain intensity and express their pain on a simple instrument (Sloman, Rosen, Rom, & Shir, 2005).

Various pain rating scales can be used to assess the pain intensity or severity. The commonly use unidimensional pain scales include the Visual Analog Scale (VAS), the Numeric Rating Scale (NRS), and the Faces Pain Rating Scales (FPS). The multidimensional pain scales are the McGill Pain Questionnaire (MPQ) and the Brief Pain Inventory (BPI) (Sloman et al., 2005). Each scale is described as follows:

The VAS is an efficient and minimally instrument measure of pain intensity, that is used widely in clinical settings. It consists of a 10-cm horizontal or vertical line, with the two end points labeled "no pain" and "worst possible pain". The left anchor usually represents "none" or "no pain", whereas the right anchor usually

represents “severe” or “worst possible pain”. The patient is required to mark the line at a point that corresponds to the level of pain intensity he or she feels. This scale is valid and reliable measure of pain intensity in post-operative patients (Gagliese & Katz, 2003).

The NRS is used in widespread and it is easy to administer but is less sensitive (Jones et al., 2005). NRS is a derivation of the VAS. It contains (horizontal or vertical) scale ranging from 0 to 5, or, 0 to 10, or 0 to 100 with “0” indicating no pain and with “5, or 10, or 100”, respectively indicating worst pain. The NRS has several advantages, such as easy to score, easy record, more reliable with patients with no or little education. It minimizes confusion of patients and has been demonstrated to be useful in clinical settings (McGuire, 1992).

The FPS was developed by Bieri et al. (as cited in Jones et al., 2005). The FPS consists of a series of progressively distressed facial expressions that represent the intensity of current pain. The seven line drawn, oval-shaped faces (without tears) are presented in a horizontal format to represent increasing pain intensity levels (Herr, Mobily, Kohart, & Wagenaar, 1998). The FPS is the most common useable tool for measuring the pain intensity. This tool has validity and reliability for assessing the pain intensity in post-operative patients (Jones et al., 2005). It has several advantages over other facial expression scales and it is suitable for use in most of the clinical settings (Hieks, VonBacyer, Spafford, Korlaar, & Goodenough, 2001).

The MPQ was developed by Melzack (1975). This tool captures pain as a multidimensional phenomenon and recognizes the shortcoming of simple pain intensity scales. It consists of 76 descriptors and 15 categories. The first 11 categories assess the sensory dimensions (intensity, quality, aggravating or relieving factors and

onset) and the second 4 categories relate to the affective dimension (feeling or emotions) of pain. The patient selects the best descriptor in each category. Each descriptor is assigned a score on a 4-pain ordinal scale: 0 = no pain, 1 = mild pain, 2 = moderate pain, and 3 = severe pain. Two measures of pain experience based on the sensory and affective descriptors are obtained. The total scores range from 0-45. The sensory subscale has 11 sensory categories making a sum of score ranging from 0-33. The affective subscale has 4 categories making a sum of score ranging from 0-12. Although the MPQ is reliable and valid and helps to evaluate pain severity and easily understood by the patients, it requires more time and concentration for successful completion (Strand, Liunggren, Bogen, Ask, & Johnsen, 2007).

The BPI scale was first developed in English. This scale is a simple format and it focuses on a limited number of relatively universal functions. The BPI scale is quickly administered assessment tool for capturing both the pain intensity and pain related interference. It is easy to translate. This tool is established in multiple languages, such as English, French, Japanese, Thai, etc. The BPI scale asks patients to rate their pain at its worst for the last 24 hours on a 0 to 10 scale. They also rate their pain at its least and its average for the last 24 hours and at the time of the study on three additional 0 to 10 scales. Each scale is presented as a horizontal row of equidistant numbers from 0-10 and is bounded by the words “no pain” at the 0 end and “pain as bad as patient can imagine” at the other end. Using the same type of 0-10 scales, patients are asked to rate separately how their interference with several life domains, including enjoyment of life, activity, walking, mood, sleep, work, and relations with others. These scales are bounded by “doesn’t interfere” at the 0 end and

“interferes completely” at the other end (Uki, Mendoza, Cleeland, Nakamura, & Takeda, 1998).

In addition, physiological and behavioral indicators are used for the assessment of post-operative pain after surgery. Indeed, physiological indicators used for continuous monitoring include temperature, blood pressure, heart rate, and common signs related to pain. Behavioral indicators can be observed through facial expression, body movements, and rigid posture (Gelinas, Fortier, Viens, Fillion, & Puntillo, 2004).

There are numerous pain assessment tools used to guide decision for actual pain management. Each instrument has its limitations and delimitations. On the basis of the instruments, the NRS and the VAS are simple and they are often used to measure the pain intensity. Both have many advantages such as, easy to use, easy to score and rapidly completed. The VAS is more sensitive tool than any other tools (Gagliese & Katz, 2003; McGuire, 1992; Strand et al., 2007). Despite this, the VAS has some limitations. McGuire reported that some patients may have a lack of understanding, visual impairment, and physical restriction or difficulties in communicating through the VAS. The NRS then is most practical. As pain assessment tools are available for use, nurses need to adopt it into their clinical practice.

Post-operative Pain Management

Post-operative pain management strategies include both pharmacological and non-pharmacological interventions. These approaches are selected on the basis of the requirements and goals of particular patients.

Pharmacological interventions

Pharmacological intervention refers to the nurses' actions to provide effective and therapeutic analgesics to alleviate a patient's pain after surgery. Usually three types of pain medication are provided to alleviate patients' pain after surgery. These are opioid analgesics (morphine, fentanyl, pethidine, hydromorphone, meperidine, codeine, and methadone), non-opioid analgesics (acetaminophen, non-steroidal anti-inflammatory drugs: NSAIDs), and adjuvants (anticonvulsants, antidepressants, local anesthetics) (Urden, Stacy, & Lough, 2008).

Opioids. Opioids are the standard pain medication used to relieve moderate to severe post-operative pain, chronic cancer pain, and some other types of pain. According to the World Health Organization (WHO) guidelines including analgesic ladder, the opioid analgesics have been considered the foundation of pain management for moderate to severe pain (Cadden, 2007). Opioids are derivatives of opium that can modulate the perception of pain by binding to mu, kappa, or delta opioid receptors in the periphery, dorsal horn, and central nervous system (Hamilton, 1996). Opioids are categorized according to their physiological action. There are currently two types of opioid analgesics: Opioid agonist includes codeine, methadone (Dolophine), hydromorphone (Dilaudid), meperidine (pethidine), morphine, and fentanyl; and opioid agonist-antagonist includes buprenorphine (Buprenex), nalbuphine (Nubain), butorphanol (Stadol), and pentazocine (Talwin). Opioids can be administered through the various routes, depending on the patient condition. The common routes include oral, parenteral, and epidural. The PCA (patient-controlled analgesia) method is more commonly used particularly at post-operation (Linton & Maebius, 2003).

Opioids have many possible adverse effects; some are common and some not. The common adverse effects of opioids are constipation, dry mouth, nausea/vomiting, sedation, and sweating (Vanegas, Ripamonti, Sbanott, & DeConno, 1998). Constipation is the secondary adverse effect of opioids and the primary adverse effect of reduced gut motor activity and increased stool transit time. The uncommon adverse effects of opioids are bad dream/hallucinations, dysphoria/delirium, myoclonus/ seizure, pruritis/urticaria, respiratory depression, urinary retention, and confusion (Cherase et al., 2004). Constipation was the most common adverse effect, with 61.3% of patients being affected, despite routine prophylaxis with stool softeners or stimulant laxatives. Nausea and vomiting with 29.3% of patient was usually occurred on the first or second day after giving opioids (Cherase et al.).

Tolerance, physical dependence, and psychological dependence are not considered to be the adverse effects of opioids, but are key concepts nurses must understand. Misconceptions of these concepts lead to ineffective pain management. Tolerance is the term used to define the phenomenon in which a patient is less susceptible to the effect of drug as a consequence of its prior administration. There are three types of tolerance: acute, chronic and cross-tolerance. Acute tolerance is the term used to describe tolerance that develops very rapidly following either a single dose or a few doses given over a short period of time. Chronic tolerance is described for the observation that drug administration over a longer period of time produces reduced drug effects. Cross-tolerance is used when tolerance to one drug confers tolerance to another (Dafters & Odber, 1989).

Physical dependence is the term used to describe the phenomenon of withdrawal when opioid is abruptly discontinued or an opioid antagonist is

administrated. Both tolerance and physical dependence are predictable pharmacological effect seen in response to repeated administration of opioids (Foley, 2002).

Psychological dependence or addiction is described as a pattern of drug uses characterized by a continued craving for an opioid, manifested as compulsive, drug-seeking behavior and overwhelming involvement in drug procurement and use (Foley, 2002). Misconception about opioid addiction that the incidence is high is well documented in pain literature (McCaffery & Ferrell, 1996).

Non-narcotic or non-opioid analgesics. Non-opioid analgesics are the short-term management of post-operative pain. Non-opioid analgesics include aspirin, acetaminophen and nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen and ketorolac. It is the first choice for the control of mild pain. This type of analgesics should be used in combination with opioids in relieving moderate to severe pain (Cadden, 2007). Non-opioid analgesics mostly act on peripheral nervous system. Therefore, they work properly for pain caused by peripheral tissue damage including post-operative pain. This type of analgesics has some properties e.g. antipyretic (fever-reducing), analgesic (pain-reducing), and anti-inflammatory (inflammation-reducing). Non-opioid analgesics are mostly administered orally. Rectal, parenteral and intramuscular forms of administration are also available. Ketorolac is frequently used in acute care setting. It is administered intramuscularly, and it has longer duration of action than any other NSAIDs (Linton & Maebius, 2003). NSAIDs have some side-effects associated with gastrointestinal toxicity, including ulcers, gastrointestinal bleeding, and fluid retention. Therefore, not all patients can use this type of drugs, particularly those who have liver or kidney disorders,

thrombocytopenia, or neutropenia. Careful assessment of the patient's previous history and present history before giving the NSAIDs is highly recommended (Cadden; Linton & Maebius).

Adjuvant analgesics. These medications are used in combination with opioid and non-opioid analgesics to manage pain. Generally, these agents were developed originally for other purposes (e.g., anticonvulsants, antidepressants, corticosteroids, adrenergic agonist, and local anesthetics) (Cadden, 2007; Hamilton, 1996).

1. Anticonvulsant drugs. Anticonvulsants or antiepileptic drugs (AEDs) affect both peripheral nerves and the central nervous system (CNS) in several ways, including sodium channel modulation, central calcium channel modulation, and changes in excitatory amino acids and other receptors. AEDs are effective for neuropathic pain and migraine headaches. Common side effects are ankle swelling more common in elderly, and ataxia (Lewis et al., 2007).

2. Antidepressants. Tricyclic antidepressants are considered the first-line systemic treatment for many neuropathic pain syndromes. Neuropathic pain generally responds more rapidly than depression. It has lower side-effects but often decrease patients' compliance and adherence (Cadden, 2007).

3. Corticosteroids. These drugs, which include dexamethasone, prednisolone, and methylprednisolone, are used for management of acute and chronic cancer pain, pain secondary to spinal cord compression, and inflammatory joint pain syndromes. Corticosteroids have many side-effects, especially when given chronically in high doses. Adverse effects include hyperglycemia, fluid retention, dyspepsia, and gastro-intestinal (GI) bleeding, impaired healing, muscle wasting, osteoporosis, adrenal suppression, and susceptibility to infection (Lewis et al., 2007).

4. Adrenergic agonist. These agents decrease norepinephrine that releases peripherally, and may be used for chronic headache and neuropathic pain. Common side effects are sedation, dry mouth, and orthostatic hypotension (Lewis et al., 2007).

5. Local anesthetics. Local anesthetics are commonly used in oral, parenteral, and topical applications. These drugs are used for acute pain resulting from surgery and trauma. Common side-effects are dizziness, paresthesia (especially around the mouth), and seizures. These agents also affect on cardiac conductivity, dysrhythmias, and myocardial depression (Cadden, 2007; Lewis et al., 2007).

Although physicians prescribe the analgesics, nurses are also responsible to assess the pain, to decide which types of analgesics should be used to reduce pain and which administration mode should be applied, such as, as needed or PRN, fixed order medications, epidural infusions, and patient-controlled analgesia (PCA) and how to evaluate the drugs' effectiveness (Linton & Maebius, 2003; Manias, 2003).

Analgesics administration is applied as a preventive approach to pain management. These analgesics are administered through several routes including oral, sublingual, rectal, transdermal, transmucosal, parenteral (subcutaneous, intramuscular, intravenous), and neuraxial (epidural or intrathecal) (Krenzischek, Dunwoody, Polomano, & Rathmell, 2008). If the pain is predictable, such as post-operative pain and cancer pain, the decision to use analgesics are more effective when given around the clock (ATC) rather than as needed (PRN). An ATC schedule maintains therapeutic blood levels of the analgesics. The ATC schedule is usually based on how long the drug lasts. If the drug lasts in every 3-4 hours, it should be administered after every 3-4 hours to maintain pain relief. Pain should be assessed before administering the analgesics for effective management (Linton & Maebius, 2003). If the pain is

unpredictable, PRN schedule is appropriate approach. Waiting for analgesics often results in increased pain intensity. In such situations, pain control is so difficult.

Non-pharmacological interventions

Non-pharmacological interventions are the effective methods for pain management. It can reduce the requirements of the doses of drug therapy and thereby minimize the side effect of drugs. Analgesic is an essential component of pain management, but it might be more effective if both strategies are utilized together (Ignatavicius & Workman, 2002). These interventions also increase the sense of personal control and coping skills about pain management. These methods provide the emotional support, help the daily activities, and create a comfortable environment, and promote pain relief (Ylinen, Vehvilainen-Julkunen, & Pietila, 2007). Non-pharmacological interventions can be categorized as physical or cognitive strategies (Lewis et al., 2007; Polkki, Pietila, Vehvilainen-Julkunen, Laukkala, & Kiviluoma, 2008). Physical strategies include acupuncture, application of heat and cold, exercise, massage, percutaneous electrical nerve stimulation (PENS), and transcutaneous electrical nerve stimulation (TENS). Cognitive strategies include distraction, hypnosis, imagery, and relaxation (breathing, imagery, meditation, art therapy, music therapy and progressive muscle relaxation) (Richards & Hubbert, 2007).

1. Physical strategies

Acupuncture. This therapy is originated from China. It is very ancient and less effective in the West. The physiological basis for this technique is unclear. However, this technique is used to relieve pain and certain diseases may be cured. Particularly, acupuncture is practiced for the treatment of pain and anesthetic

purposes during diagnostic procedures of several diseases (Ignatavicius & Workman, 2002).

Heat and cold application. Heat and cold compress both reduced in muscle spasm and decreased swelling or congestion in a pain area. Heat should not be used after trauma and when edema develops, because heat treatment increases bleeding tendency. Cold treatment probably slows the conduction velocity of nerves (Ignatavicius & Workman, 2002). Matthews and Malcolm (2007) reported that only 6% of nurses used cold and heat compress to relieve pain.

Massage. Massage is used to promote the relaxation and relieve muscle cramps. It is commonly applied to the back, neck, and large leg muscles. It should not be applied to areas with injury, phlebitis, or skin lesions or to patients with bleeding problems (Ignatavicius & Workman, 2002; Linton & Maebius, 2003). Massage was proved to be effective and safe adjuvant therapy for the relief of acute post-operative pain (Mitchinson et al., 2007).

2. Cognitive strategies

Distraction. Distraction technique changes the patients' sense of control as well as increases pain tolerance, decreases pain intensity and alters the quality of life (Linton & Maebius, 2003). Distraction technique helps to reduce the mild to moderate pain during the brief periods of procedure including the dressing changes, intramuscular injection, and vein punctures. Some distraction methods include rhythmic breathing, listening to music, laughing, counting, watching television, reading, exercising, resting, talking on the phone, and visiting with others (Hamilton, 1996; Linton & Maebius).

Hypnosis. Hypnosis alters state of consciousness in which a person enters and loses an overall sense of reality. This technique helps the patients to overcome the emotional consequences of pain and can promote a positive state of mind (Ignatavicius & Workman, 2002). It has been demonstrated to reduce pain with acute procedural pain and chronic pain conditions (Patterson & Jensen, 2003).

Relaxation. Relaxation technique helps the patients to get rid of anxiety, muscle tension, and decreases heart rate, respiratory rate, oxygen consumption, and normal or decrease blood pressure and emotional stress (Ignatavicius & Workman, 2002; Lewis et al., 2007; Linton & Maebius, 2003; Seers & Carroll, 1998). This method decreases mental stress and physical tension, and facilitates sleep. Relaxation is more effective for mild to moderate pain than for severe pain (Lewis et al.; Linton & Maebius). Patients are advised to stay in calmness and peacefulness (Kwekkeboom & Gretarsdottir, 2006). Kwekkeboom and Gretarsdottir focused on the relaxation technique and reported that these methods can be used alone, without combination with other interventions such as imagery or cognitive behavioral therapy. Slow rhythmic breathing helps in decreasing anxiety and control pain (Ylinen et al., 2007). Relaxation promotes patients' well-being without the risk of using additional drug therapies, and it may enhance an individual's feeling of control. Relaxation techniques also decrease the sensory and affective components of post-operative pain (Guyton, 1991; Roykulcharoen & Good, 2004). A systematic review including seven studies revealed that there was some weak evidence to support the use of relaxation to reduce acute pain, such as post-operative pain (Seers & Carroll). Thus it should not be used as the main treatment for management of post-operative pain.

Barriers to Effective Post-operative Pain Management

The Agency for Healthcare Research and Quality (AHRQ) divides the barriers to effective pain management into three categories viz. healthcare system barrier, healthcare professionals' barrier, and patients' barrier (McCaffery & Pasero, as cited in Wangmo, 2004)

Healthcare system barriers

Improving pain management is necessary and needs to be recognized according to the priority. However, historically pain management has never been a priority within the health care system. One study analyzed the lack of acute pain management in several clinical settings (Niekerk & Martin, 2003). Another study reported that health care system does not hold clinical accountability for assessing and relieving pain (Rejeh, Ahmadi, Mohammadi, Anoosheh, & Kazemnejad, 2008). This study revealed 353 hospitalized patients who had pain experiences, but only 54% of health care team asked them about their pain and kept in their record (Rejeh et al., 2008). Similarly another study reported that no assessment of pain intensity report was documented in any health caregiver (McCaffery & Pasero, 1999).

In addition, Niekerk and Martin (2003) reported that insufficient cooperation by physicians with nurses and inadequate prescriptions of analgesic medications were the most common barriers to effective pain management. Fear of regularity scrutiny for prescribing controlled substances, i.e., opioids, has been shown to discourage physicians from prescribing opioids of sufficient strength for the patient's pain (Cleeland et al., 1994).

Healthcare professionals' barriers

The community believes and patients expect that the nurses and physicians should have good quality education and experiences, and have a comprehensive knowledge and attitudes of pain management that is readily interpreted into clinical practice. However, the fact is that several studies identified health care professionals' lacking of education; poor pain assessment; having concerns about opioids particularly in addiction and respiratory depression; lack of communication; having inadequate pain assessment tools; and misjudging of pain severity (Clarke et al., 1996; Ely, 2001; McCaffery & Ferrell, 1997; McCaffery & Pasero, 1999; Urden et al., 2008). Concerns regarding tolerance, dependence, and addiction are common barriers of effective pain management. Patients, family members, and health care providers often share these concerns (Urden et al.).

An educational program for pain management addressing issues mentioned above is needed to be incorporated into basic nursing education and should be provided to all health care professionals. However, educational preparation for pain management is still lacking (McCaffery & Pasero, 1999). Nursing concerns with addiction because it can contribute to misinterpretation of signs during the pain assessment process. In fact, a patient who received opioid analgesics has less than 1% of addiction rate, even in a sample of chronic non cancer pain (Noble, Tregear, Ireadwell, & Schaelles, 2008). Another concern of the health care professionals is the fear that aggressive management of pain with opioids will cause critical respiratory depression. The incidence of respiratory depression is also less than 1%. More than half of the nurses indicated that they had conflicting experiences regarding the pain

management (Niekerk & Martin, 2003). Thus, pain education should incorporate all these issues in the program.

Patients' barriers

Patients are the cornerstone of their own effective pain management. However, research evidence showed that several barriers are from themselves. As addressed earlier, best pain assessment is self-report. In the reality, some patients are reluctant to report the intensity of pain. More than 70 % of patient felt reluctant to report pain, even reluctant to take pain medication, especially opioids. They have fear of addiction, fear of tolerance, concern about side effects, fear of injection, desire to be a "good" patient, desire to be stoic, forgetting to take analgesic, fear of distracting the health care, concern that pain signifies disease progression, sense of fatalism, and ineffective medication (Lewis et al., 2007; Worakul, Petpichetchian, & Nilmanat, 2008).

Knowledge and Attitudes of Nurses and Their Practices Regarding Post-operative Pain Management

This section reviews the literature related to post-operative pain management including the knowledge and attitudes of nurses and their practices regarding post-operative pain management, and relationship between knowledge and attitudes of nurses and their practices regarding post-operative pain management.

Knowledge and attitudes of nurses regarding post-operative pain management

Knowledge and attitudes of nurses regarding pain management is based on the

assumptions about what nurses should know and value to provide a high quality of care for patients suffering from pain and nurses can perform many interventions for pain relief (Coll et al., 2003; Richards & Hubbert, 2007; Sloman et al., 2005; Textor & Porock, 2006). Knowledge and attitudes of nurses about pain management is a significant part of nursing care. Many experts expressed that formal nursing education fails to prepare nurses adequately to care for patients in pain. The study showed that 86% of nurses expressed that their basic nursing education did not prepare them well to take care of patients with pain and 88% indicated there is a need to increase knowledge and attitudes and skills in the area of pain management (Clarke et al., 1996). Consequently, increasing numerous efforts were made to re-educate the health care professionals, reach the high quality care, and widespread dissemination of clinical practice guidelines. Despite this, very little changes in the clinical practice and improvement of pain management are observed (Ward & Gordon, as cited in McCaffery & Ferrell, 1997).

Nurses had inadequate knowledge and attitudes in many areas as evident by several studies for over 20 years. Clarke et al. (1996) used the McCaffery and Ferrell's Nurses' Knowledge and Attitudes Survey. They found that the overall mean score on nurses' knowledge and attitudes was 62% (ranged from 41-90%). They lacked knowledge on the anatomy and physiology of pain and they could not distinguish between acute and chronic pain which is considered quite a basic knowledge necessary in the initial step of pain assessment. Another area is related to pain assessment. The commonly reported its lacking areas were when pain occurs in the elders and whether patient's self report is reliable (de Rond, de Wit, & Dam, 2001; Textor & Porock, 2006). The major area that has been reported repeatedly in most

studies is related to pain medication, particularly opioids and misconceptions about its use. For instance, opiate properties, addiction, risk of respiratory depression, use of adjuvant drugs were reported to be content areas that nurses were lacking (Cason, Jones, Brock, Maese, & Milligan, 1999; de Rond, et al., 2001; Dihle, Bjolseth, & Helseth, 2005; Matthews & Malcolm, 2007; Sandal & Heindel, 1999; Schafheutle, Cantrill, & Noyce, 2001; Textor & Porock).

There is a study attempting to demonstrate if providing training to nurses would increase their level of knowledge and had positive attitudes towards pain. Matthews and Malcolm (2007) examined the knowledge and attitudes of nurses between two groups of nurses using the McCaffery and Ferrell's Nurses' Knowledge and Attitudes Survey. In group one nurses completed a knowledge and competency training programme within an orthopaedic centre whereas nurses in group two did not yet complete the knowledge and competency training programme in pain management. They found that the overall mean score on nurses' knowledge and attitudes was 73.8%. Using Pearson's Chi-Square to analyze the nurses' knowledge and competence in pain management, they found no statistically significant difference in the total knowledge and attitudes scores between the two groups. However, group one had a higher correct response rate ($p = .001$) in the vignettes that are based on daily nursing practice. Interestingly, they found a severe deficit in knowledge relating to questions about non-pharmacological methods of treating pain and opioid use in chronic pain conditions. The researchers explained that it might be due to the fact that the contents being asked in the questionnaires were not covered in the contents being trained. Some certain areas that nurses lacked should be included in the future training programme (Matthews and Malcolm).

Practices regarding post-operative pain management

Nurses are the key persons and 24-hour providers of acute pain management in hospital setting. They assess pain and plan to minimize the pain appropriately by using the available resources and facilities, and evaluate the effectiveness of their actions and interventions. Nurses are usually responsible for monitoring the effects of medications, which are administered in variety of ways, including PRN or 'as needed' medications, fixed order medications, epidural infusions, and PCA (Manias, 2003). Nurses' practices in pain assessment and evaluation and pain intervention will be described below.

Pain assessment and evaluation. Regarding pain assessment, several studies provide evidence support for many years that nurses tend to underestimate patient's pain. A classical study conducted by Seers (as cited in Field, 1996) was cited in many documents. In 1987, Seers compared nurses' and patients' pain ratings over a 7-day period postoperatively and found that on 67% of occasions nurses and patients disagreed on pain ratings, with 54% of nurses rating the pain at a lower level than patients did. A decade later, Field replicated Seer's study. She used a convenience sample of 39 patients and 78 nurses. They were asked to rate the patient's pain intensity independently using a 5-point verbal rating scale. It was found that nurses gave consistently lower ratings than patients. Even worse, in Clarke et al.'s study (1996), on their pain audit findings, they found more percent of nurses (76%) did not document the use of a patient-self report tool in their practice.

Until recently, the study provides support that nurses still underestimated patients' pain and did not use proper pain scale even though it is now available as evident in Ene, Nordberg, Bergh, Johansson, and Sjorstrom's study (2008). The

researchers conducted a two-part study. Part one was the baseline comparison and Part two was after they implemented the training program for nurses and physicians. Patients of both parts were asked to rate their pain intensity using the VAS (0-100), 24-48 hours post surgery. The scores on documented patients' records, indicating nurses' pain assessment, were used to compare with the patients' self-report pain scores. There were interesting findings. Nurses in this study overestimated mild pain but underestimated severe pain. The nurses' ability to assess in accordance with patients was better after two years, however, the number of documented pain scores in the patients' records decreased. Moreover, 40% of nurses reported that they did not use the VAS and that they did not assess pain both at rest and activity (Ene et al., 2008). These findings indicated that problems in pain assessment still exist and providing education to increase knowledge alone may not always warrant the change in nurses' practice. Our aim is then to determine and help make the extent to which nurses can use the pain assessment data to inform the decision for taking the next step, giving pain interventions, pharmacological and non-pharmacological interventions, to relieve the pain.

Pain intervention: *Pharmacological and non-pharmacological intervention*. Over a long time, several surveys have shown that many patients still suffer from moderate to severe post-operative pain as a result of inadequate pain interventions given to them (Carr & Thomas; Cohen; Marks & Sachar; Dolin et al.; Zalon; as cited in Ene et al. 2008). Even though there are clinical practice guidelines for pain management available, analgesics are more effective and new technology of drug administration are developed, the management of post-operative pain continues to

remain problematic and unsatisfactory (Coulling, 2005; Ene et al.). One factor contributing to this problem comes from nurses' practice.

Nurses are responsible for the administration of all medications, according to doctors' prescription. In particular, when medication is prescribed on a PRN basis, nurses choose which one currently is still the predominant order for post-operative analgesia. Nurses assess the patient's pain, decide to administer analgesics, choose the medication and route of administration, and evaluate the outcome of such intervention (Schafheutle et al., 2001). Nurses are able to identify the discrepancies between the amounts of analgesics and what analgesics are administered according to prescription.

Several studies provide evidence to support that nurses' practice in pain pharmacological intervention are less than optimal. Nurses administered the analgesics as needed rather than fixed order and gave less analgesic than prescribed (Dihle et al., 2005; Manias, Bucknall, & Botti, 2005). Previous studies showed that on the first post-operative day nurses administered far less analgesia than the PRN schedule would have permitted, although 91% of patients were in pain (Gillies et. al., 1999; Richards & Hubbert, 2007). Titler et al. (2007) found that out of 709 hospitalized patients for hip fracture, analgesic orders were PRN basis during the first 24 hours after admission, and only 22.3% received around the clock administration of analgesics. In addition, 172 nurses who cared these patients and completed the pain management practice questionnaires reported that around the clock administration of analgesics were preferable, but only 33.7% believed and applied these methods (Titler et al.). Despite nurses' theoretical knowledge about post-operative pain management, they did not apply appropriately in clinical setting, and they did not seem to prioritize

pain problem and pain management (Twycross, 2007). Moreover, nurses accept that it is a normal phenomenon of post-operative patients (Ene et al., 2008).

In addition to pharmacological interventions, nurses play important role in implementing the non-pharmacological methods for pain alleviation. Some studies demonstrated that nurses seldom used non-pharmacological treatment for post-operative pain relief and also less than expected. Manias et al. (2005) conducted an observational study in Australia to examine how nurses managed patient's pain after surgery. Fifty-two nurses were randomly observed for 316 pain events. They found that nurses performed the following non-pharmacological interventions to manage pain: apply heat compression (0.6%); hot bath (1.3%); massage (1.3%); changing position, relieving pressure (11.1%); bandaging, reinforcing dressings, splinting (12.7%); discussing management options with patients (15.8%); and discussing management options with health professional (17.4%). Another study conducted in the US revealed that nurses did not document their use of non-pharmacological intervention in 90% of the patient's record charts being audited (Clarke et al., 1996). Findings from these studies flag the necessity to further explore what factors may help explain why nurses seldom use them.

Relationship between knowledge and attitudes of nurses and their practices regarding post-operative pain management

Several groups of researchers made attempts to examine the relationship between nurses' knowledge and attitudes and their practices or variables related to practices. For example, Glajchen and Bookbinder (2001) examined the relationship between nurses' knowledge and perceived competence in pain management. There

were 1,236 nurses participated in this study. They developed a 44-item questionnaire to measure nurses' knowledge about pain. There were 31 true-false items and 13 items derived from the Wisconsin Pain Knowledge Scale. There were 17 items using a 4-point Likert scale measured subjective competence. A statistically significant association was found between pain knowledge and subjective competence (Chi-square = 83.420, $p = .01$, Pearson's $r = .40$). In contrast, Twycross (2007) conducted the study to explore the relationship between nurses' theoretical knowledge and the quality of their practice. While studying the sample of 13 nurses, the researchers found no positive relationship between nurses' level of theoretical knowledge and how they actually managed pain. Despite the available evidence about pain management practice guideline; they did not appear to routinely apply their knowledge in practice (Twycross).

Attempt has also been made to examine this phenomenon in nursing students. Chiang, Chen, and Huang (2006) conducted a quasi experimental study with 181 student nurses in Taiwan. These students participated in the 4-hour pediatric pain education program (PPEP). Subjects responded to the pretest and post-test questionnaires measuring the knowledge and attitudes of nurses and self-efficacy of pain assessment and pharmacological and non-pharmacological pain management. The results showed that knowledge and attitudes of nurses and their perceived self-efficacy improved after pain education ($p < .001$). Self-efficacy can be perceived as an antecedent to actual practice. Even though the researchers did not directly examine the relationship between these two variables, the finding from this study supports the premise that increasing knowledge and attitudes through education program may have an effect in enhancing perceived self-efficacy and then practice.

Factors Contributing to Knowledge and Attitudes of Nurses and Their Practices Regarding Post-operative Pain Management

There are some factors contributed to nurses' knowledge and attitudes and practices regarding post-operative pain management. Literature has shown that nurses' age, personal experience of pain, nursing education and/ or training, and years of working experience may have relationships with knowledge and attitudes and practice but the findings were inconclusive.

Age. In a literature review conducted by Allcock (1996), she concluded that age of nurses does not seem to be influential in relation to their assessment of pain. However, some study found that nurses who were over 30 years tend to overestimate and nurses who were less than 25 years tend to underestimate burn pain (Iafrati, as cited in Allock).

Personal experience of pain. The evidence that personal experience of pain was correlated with nurses' knowledge and attitudes and their practice was inconclusive. Clarke et al. (1996) and Patraki-Koubani et al., (2003) found no correlation between nurses' level of personal pain intensity and the overall score and individual items of knowledge and attitude. As opposed to the above two studies, Holm, Cohen, Dudas, Medema, and Allen (2007) found that nurses' level of personal pain intensity was the only variable that predicted significantly perceptions of patients' physical suffering and psychological distress. This finding indicates that the more nurses had experienced their own pain, the more likely they would concern about their patient's pain.

Nursing education and/ or training. Educational experience is one of the most important factors of pain management. It helps the way that nurses perceive their

patient's pain (Allcock, 1996). The more nurses have been trained in clinical practice, the more likely they better perform their pain management practice. This is evident in Halfens et al.'s study (as cited in Field, 1996). They found that first-year student nurses recognized less pain to patients than did the third and fourth-year student nurses and trained nurses. Importantly, the pain content including in each level of nursing program was found to be significant contributor to nurses' knowledge and attitudes and their pain management practice. In Clarke et al.'s study, nine masters'-prepared nurses were included. They found that these nurses had the highest mean score on the knowledge and attitudes survey questionnaire. These nurses received in-depth pain management from nursing faculty expert in pain. Their scores were 10% higher than other nurses possessed diploma, associate, and baccalaureate degree. It is, perhaps, not a level of education, but the pain contents included in the program that contribute to this difference. Lui, So, and Fong (2008) conducted the study with 143 Hong Kong nurses. The majority of nurses participated in this study had a bachelor or higher degree (82.5%). They found the very low knowledge and attitudes scores of nurses. They explained that it was due to inadequate education on pain management included in the nursing curriculum.

Year of working experience. One source of nurses' knowledge and attitudes and their practice comes from own experiential learning in their clinical practice. Two studies examined the correlation between years of working experience and nurses' knowledge and attitudes. Erkes, Parker, Carr, and Mayo (2000) studied with 30 medical/ surgical nurses. They found a positive significant correlation between years of nursing experience and knowledge and attitudes ($r_s = .37$, $p = .047$). Similarly, Lui et al. (2008) found that the length of clinical experience of nurses was significantly

correlated with knowledge and attitudes and was accounted for 9% of the explained variance. Mason (as cited in Allcock, 1996) studied a sample of 161 nurses. It was revealed that nurses with less than one year of working experience were more likely to overestimate patient's pain, whereas those with 6-10 years of working experience were more likely to underestimate the patient's pain.

Summary

In summary, pain is a personal experience which is associated with actual or potential tissue damage. It is also an unpleasant sensory feeling in the part of the body and emotional experience. Any surgical procedures can be a cause for post-operative pain. The consequences of inadequate, ineffective post-operative pain management can have the negative effects on the physical and psychosocial well-being of surgical patients. Patients may have unnecessary suffering. Thus, it is crucial to manage post-operative pain effectively. The initial step is pain assessment. Currently, various assessment tools are available for use that is appropriate and understood by the patients and nurses. Several studies indicated less use of pain assessment tools which may have an impact on nurses' decision to take subsequent actions to manage the pain.

Nurses are involved in pain management inevitably. Nurses can provide pharmacological and non-pharmacological interventions for successful post-operative pain management. However, barriers of post-operative pain management including health system barriers, healthcare professionals' barriers, and patients' barriers have been reported. Among such barriers, lacks of knowledge and negative attitudes as well as under practice or not practice in some certain areas among nurses were

evident. Some factors contributed to nurses' knowledge and attitudes and their practices. Throughout these decades, there have been many studies examining knowledge and attitudes of nurses about post-operative pain management and nurses' practices in several countries. However, in Bangladesh, no known studies were found. Thus, this study was conducted to offer baseline information in order to further develop effective post-operative pain management in Bangladesh.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter covers all elements of research methodology including research design, settings, target population, sample size, instruments, ethical consideration, data collection procedures and data analysis.

Research Design

The descriptive correlational design was used to examine the relationship between knowledge and attitudes of nurses and their practices regarding post-operative pain management.

Setting

The study was conducted at two public hospitals in Khulna, Bangladesh including one medical college hospital (Hospital A), and one district (general) hospital (Hospital B). Hospital A is a referral hospital and a teaching hospital for medical students and nursing students. There are 250 beds in this hospital and the numbers of nurses are 200. Hospital B has 150 beds, and the numbers of nurses are 130. Nurses working in public hospitals in Bangladesh, including these two hospitals are usually rotated to work in more than one clinical area every three to six months. At Hospital A, there are eight surgical patient care units; two male surgical units, two female surgical units, one orthopedic unit, ear-nose-throat, gynecology, and private cabins. For Hospital B, there are six surgical patients care units including one male

surgical unit, one female surgical unit, one orthopedic unit, ear-nose-throat, gynecology, and private cabins. The sample was drawn from those surgical units.

Target Population

The target population of this study was the nurses who were taking care of surgical patients in Hospital A and Hospital B in Bangladesh.

Sample and Sample Size

The sample was drawn from the target population. The sample size was estimated by using power analysis. The estimated sample size was calculated for a level of significance of .05, an expected power of .80, and an estimated population effect size (correlation coefficient ρ) of .40 as determined by the previous study (Glajchen & Bookbinder, 2001). Glajchen and Bookbinder conducted a survey study with 1,236 American nurses. They found the significant correlation between nurses' knowledge and subjective competence in pain management (χ^2 = 83.420, p = .01; Pearson's r = .40). Thus, using the effect size of .40, the estimated sample size was 50 (Polit & Beck, 2008). However, to overcome the anticipated low response rate and lower effect due to the difference in population of this study (Bangladeshi nurses) and the previous study (American nurses), the researcher doubled this initial estimated number and round up, yielding a total number of 100 nurses (50 nurses from each hospital).

Sampling Technique

Nurses were randomly selected by using the following inclusion criteria:

1. Had been taking care of surgical patients for the last six months

2. Earned a minimum of Diploma Degree in Nursing

Instruments

The instruments were divided into three parts. Part one was Nurses' Demographic Data Form; Part two was Nurses' Knowledge and Attitudes Regarding Post-operative Pain Management Questionnaire (Appendix B); and Part three was Nurses' Caring Behavior Regarding Post-operative Pain Management Questionnaire (Appendix C).

Part One: *Nurses' Demographic Data Form*. The Nurses' Demographic Data Form was used to collect nurses' personal information. It consisted of seven items: gender, age, religion, level of nursing education, duration of taking care for surgical patients, personal experiences of pain, and experiences of pain management training.

Part Two: *Nurses' Knowledge and Attitudes Regarding Post-operative Pain Management Questionnaire*. The Knowledge and Attitudes Survey Regarding Pain Questionnaire originally developed by Ferrell and McCaffery (1987) and recently revised (2008) was modified by the researcher with the permission from the developers (Appendix E). The original tool is a recognized, reliable, and valid tool. The internal consistency reliability was established (alpha coefficient >.70) with items both knowledge and attitudes. It was developed to cover areas of general pain management, pain assessment, and use of analgesics that can be applied to post-operative pain but some modification was needed to better capture knowledge and

attitudes of nurses in post-operative pain and to be relevant to Bangladesh health care system context.

The modified version of this questionnaire, namely "Nurses' Knowledge and Attitudes Regarding Post-operative Pain Management Questionnaire: NKAPQ" consists of 40 closed-ended questions, each with only one correct answer true or false items (22 items, No.1-22) and multiple-choice questions (18 items, No. 23-40). Ten items were modified from the original version (item number 2, 5, 9, 14, 18, 24, 25, 28, 30 and 32). Items 2 and 14 were related to child pain; items 5, 24, 25, 28, and 30 were related to cancer pain. Thus, the researcher modified these items to fit with post-operative adult patients. Items 9 and 18 were changed by using the drug names known by Bangladeshi nurses. Lastly, item 32 related to cultural issues was modified with regard to Bangladesh cultural context.

The NKAPQ has a total score of 40. A score of each subject was converted to percentage. Based on this percentage, the researcher categorized the percent scores into five levels, according to the well-accepted cutoff points using in education. According to McDonald (2002), a composite percent correct score can be used to interpret the competencies of a respondent (student) and grade assignment can be made for five levels: A, B, C, D, and F. Using McDonald's percent correct score cutoff points, the researcher categorized the level of knowledge and attitudes and practices into five levels. The higher scores indicated the higher level of knowledge and positive attitudes of nurses toward post-operative pain management.

Composite Percent Score	Grade	Level of Knowledge and Attitudes and Practice
90.00-100%	A	Very High
80.00-89.99%	B	High
70.00-79.99%	C	Moderate
60.00-69.99%	D	Low
<60%	F	Very Low

Part Three: *The Nurses' Caring Behavior Regarding Post-operative Pain Management Questionnaire*. The nurses' practice regarding post-operative pain management was measured by using the Nurses' Caring Behavior Regarding Pain Management Questionnaire: NCBPQ (Appendix C) developed by Erniyati (2002). There were 36 force-choice (yes/ no) items with two subscales: pain assessment-evaluation (18 items) and pain intervention (18 items). One last open-ended question asks whether the nurses would provide any alternatives to alleviate patients' pain. The response format for items 1-36 was yes or no where "yes" indicated the practice of that item (score 1), and "no" indicated not practice (score 0). The total score ranged from 0 to 36. The scores were converted into percentage, and categorized similar to the NKAPQ scores. The higher scores indicated the more actions nurses performed to reduce post-operative pain.

Validity and Reliability of the Instruments

In this study, the instruments were translated using back-translation technique (Sperder & Devellis, 1994). Two Bangladeshi bilingual translators involved in the translation process. The first translator translated the original English version to a

Bangla version. Then, the second translator translated the Bengali version back to English. Finally, the two English versions were examined for comparability of language and similarity of interpretability by the thesis advisory committee. After revision, following the committee suggestion, three experts in this field reviewed a Bengali version for content validity of the tools. The experts included one surgeon, one master-prepared nurse administrator, and one master-prepared staff nurse working with post-operative patients.

The content validity concerns the degree to which the instruments had appropriate items to measure the nurses' knowledge and attitudes of pain management and pain management practice among nurses in Bangladesh. The researcher asked the experts to validate the contents with regard to accuracy and cultural relevance in Bangladesh health care context. The researcher revised the tools based on the experts' comments and suggestions. One revised item (Item 9 of the NKAPQ) was related to the antihistamine, hydoxyzine (Vistaril), which is not available in Bangladesh. This medication was dropped from the item statement asking whether it is a reliable potentiator of opioid analgesics.

The reliability of these two questionnaires (Part two and three) were examined for stability by using test-retest method (approximately 7-day interval), conducted with 20 nurses, who met the same criteria as the actual sample. The test-retest reliability coefficient was .72 for the NKAPQ and .87 for the NCBPQ.

Ethical Consideration

The study was approved by the Institutional Review Board, Faculty of Nursing, Prince of Songkla University (PSU), Thailand, and the permission for data

collection from the Director of the selected hospitals was obtained. Approval was also obtained from the charge nurses of the target units. The purposes and data collection procedure of the study were explained to the eligible nurses. They were informed that their participation was purely voluntary and that the confidentiality would be strictly maintained. No pressure was applied on any participants in the study. Willingness to fill in the questionnaires was taken as consent to participate (Appendix A). One-time follow up was made to maximize the returned questionnaires without any coercion.

Data Collection Procedure

The following steps were conducted during the data collection:

1. After the proposal was approved by the Institutional Review Board, and the request letter for data collection was granted by the Dean, Faculty of Nursing, PSU, the researcher submitted the letter to the hospital directors and the nursing superintendents.

2. After the approval from the target setting was granted, the researcher met the nursing superintendents and nursing supervisors to explain the study objectives and data collection procedure. The researcher requested for the name list of nurses currently working in these hospitals.

3. The researcher identified potential subjects who met the inclusion criteria, followed by simple random sampling of 50 subjects from each hospital. The researcher established a sampling frame and listed all names of eligible subjects. The name list was used to draw 50 subjects from each hospital.

4. The researcher approached the charge nurses of the selected subjects, explained the study objectives, and asked the charge nurses to help distribute the

questionnaire to the selected subjects. The researcher allowed a maximum of two weeks to collect the questionnaires.

Data Analysis

Data were analyzed by using descriptive statistics, inferential statistics, and simple content analysis for answering the questions as mentioned below.

Descriptive statistics: Frequencies, percentages, means and standard deviations were used for presenting demographic data, the level of knowledge and attitudes of nurses about pain management in post-operative patients, and the level of practice of nurses about pain management in post-operative patients.

Inferential statistics: Based on the data of 88 subjects, the knowledge and attitudes scores were not normally distributed and one subject had the extreme lowest score. The decision was made to delete this case. Finally, the knowledge and attitudes scores were normally distributed. In addition, the linearity assumption was tested and the finding supported this assumption. Therefore, Pearson product-moment correlation coefficients were used to examine the relationship between knowledge and attitudes of nurses and their practices, knowledge and attitude of nurses and two nurses' practices subscales: pain assessment-evaluation and pain intervention. The significance level was set at .05.

In addition, simple content analysis was used to analyze the qualitative data from one open-ended question for the nurses' practice regarding post-operative pain management questionnaire.

CHAPTER 4

RESULTS AND DISCUSSION

The purpose of this chapter is to present the result of the study and to discuss the findings of each research question. The results and discussion of the study are presented as the following headings.

1. Nurses' characteristics

2. Knowledge and attitudes of nurses regarding post-operative pain management

3. Nurses practices regarding post-operative pain management

4. Relationship between knowledge and attitudes of nurses and their practices, knowledge and attitudes of nurses and their practices-pain assessment evaluation, and knowledge and attitudes of nurses and their practices-pain intervention.

Results

Nurses' Characteristics

Initially, one hundred nurses were approached. Only 88 returned questionnaires were used for the data analysis (88% response rate). One subject behaved as an outlier as her score on the knowledge and attitudes was as low as 27.5% and the next subject scored 40%. The researcher examined whether keeping or deleting this case would contribute to the different findings. It was found that there was no influential effect on the study findings. Therefore, the decision was made to delete this case. The subsequent analysis and its findings presented here were based on

87 subjects. Forty-six subjects were from Hospital A, and 41 subjects were from Hospital B. The mean age of the subjects was 38 years (SD = 4.03), ranging from 31 years to 52 years. All subjects were female. More than half of them were Muslim (57.5%). For the educational level of the subjects, 97.7% had diploma degree and only two nurses (2.3%) had bachelor degree. Three-fifths of the nurses indicated having past pain experience (62.1%). Among the nurses who had pain experience, the types of nurses' pain experience, in order, were as follows: surgical pain (46.3%), back pain (37.0%), headache (11.1%) and stomach pain (5.6%). All subjects had never attended a pain management training program. The mean duration of nurses' experience in caring for patients in surgical wards was approximately two years (Table 1).

Table 1

Frequency and Percentage of Nurses' Demographic Characteristics (N = 87)

Characteristics	n	%
Age (years): M = 38.07, SD = 4.03, Min = 31, Max = 52		
30-39	50	57.5
$\geq$ 40	37	42.5
Religion		
Islam	50	57.5
Hinduism	36	41.4
Christianity	1	1.1

Table 1 (Continued)

Characteristics	n	%
Level of nursing education		
Diploma	85	97.7
Bachelor degree	2	2.3
Pain experience		
No	33	37.9
Yes	54	62.1
Surgical pain	25	46.3
Back pain	20	37.0
Headache	6	11.1
Stomach pain	3	5.6
Experience of attending pain management training program		
No	87	100
Duration of nurses in caring for patients in surgical ward (year) M = 1.98, SD = 2.08, Min = 1, Max = 10		

Knowledge and attitudes of nurses regarding post-operative pain management

Table 2 presents the frequency and percentage of nurses according to the level of their knowledge and attitudes. Overall, the level of knowledge and attitudes of nurses participating in this study was very low, presenting by the total mean score of 59.05% (SD = 5.62) with a minimum and maximum score of 40% and 70%, respectively. When categorizing the nurses according to their level of knowledge and attitudes, the majority of the nurses had very low level (44.8%) to low level (54.1%) of knowledge and attitudes.

Table 2

Frequency and Percentage of Nurses According to the Level of Knowledge and Attitudes of Nurses in Post-operative Pain Management (N = 87)

Level of Knowledge and Attitudes of Nurses (% score)		n	%
Very Low	(<60%)	39	44.8
Low	(60.00-69.99%)	47	54.1
Moderate	(70.00-79.99%)	1	1.1
M = 59.05%, SD = 5.62, Min = 40%, Max = 70%			

Additional item analysis was made to determine which items more nurses could answer correctly and fewer nurses could answer correctly (Table 8, Appendix D). The five items with highest and lowest percentage of nurses answered correctly are presented in Table 3. Five items that highest numbers of nurses answered the items on the NKAPQ correctly, in order, were: (1) Benzodiazepines are not effective pain relievers unless the pain is due to muscle spasm; (2) Vital signs are not always reliable indicators of the intensity of patient's pain; (3) Analgesics for post-operative pain should initially be given around the clock on a fixed schedule; (4) The most likely reason a patient with pain would request increased doses of pain medications is the patient's increased pain; and (5) Elderly patients can tolerate opioids for pain relief. Five items that lowest numbers of nurses answered correctly were: (1) Patients may sleep in spite of severe pain; (2) Non-drugs methods useful for combining with treatment of post-operative pain are relaxation, music, and massage; (3) Even the source of the patient's pain is unknown, opioids can be used during the pain

evaluation period; (4) Aspirin and other nonsteroidal anti-inflammatory agents are effective analgesics for acute post-operative pain; and (5) The patients should be advised to use non-drug techniques concurrently with pain medications.

Furthermore, two case studies regarding nurses' knowledge in pain assessment and management were examined. There were two patients that they reported their pain level as 8 by using the Numeric Rating Scale. For the patient who was smiling, 69% of the nurses recorded his pain level as 8, whereas, for the grimacing patient, only 62.1% of the nurses recorded this patient pain level as 8. In addition, only 12 nurses (13.8%) would increase the dose for the grimacing patient, whereas, 7 of them (8.0%) would increase the dose for the smiling patient (Table 4).

Table 3

Five Items with Highest and Five Items with Lowest Percentage of Nurses Answered Correctly on the Nurses' Knowledge and Attitudes Questionnaire (N = 87)

Knowledge and Attitudes of Nurses	n	%
Five items with highest percentage answered correctly		
1. Benzodiazepines are not effective pain relievers unless the pain is due to muscle spasm	68	78.2
2. Vital signs are not always reliable indicators of the intensity of patient's pain	65	74.7
3. Analgesics for post-operative pain should initially be given around the clock on a fixed schedule	65	74.7
4. The most likely reason a patient with pain would request increased doses of pain medications is the patient's increased pain	65	74.7
5. Elderly patients can tolerate opioids for pain relief	64	73.6

Table 3 (Continued)

Knowledge and Attitudes of Nurses	n	%
Five items with lowest percentage answered correctly		
1. Patients may sleep in spite of severe pain	10	11.5
2. Non-drugs methods useful for combining with treatment of post-operative pain are relaxation, music, massage.	17	19.5
3. Even the source of the patient's pain is unknown, opioids can be used during the pain evaluation period	21	24.1
4. Aspirin and other non-steroidal anti-inflammatory agents are effective analgesics for acute post-operative pain	22	25.3
5. The patients should be advised to use non-drug techniques concurrently with pain medications	29	33.3

Table 4

Frequency and Percentage of Nurses Answered on Two Case Studies: *Smiling and Grimacing Patients Regarding Pain Scores and Nursing Action (N = 87)*

Items	Smiling		Grimacing	
	n	%	n	%
Pain score marked by nurses				
0 (no pain/no discomfort)	8	9.2	6	6.9
1	-	-	4	4.6
2	-	-	-	-
3	1	1.1	-	-
4	1	1.1	1	1.1
5	-	-	1	1.1
6	2	2.3	4	4.6
7	8	9.2	14	16.1
8*	60	69.0	54	62.1
9	2	2.3	-	-

Table 4 (Continued)

Items	Smiling		Grimacing	
	n	%	n	%
Pain score marked by nurses (continued)				
10 (worst pain/discomfort)	5	5.7	3	3.4
Actions taken by the nurses at this time				
1Administer no morphine at this time	12	13.8	13	14.9
2Administer morphine 1 mg IV	50	57.5	41	47.1
3Administer morphine 2 mg IV	18	20.7	21	24.1
4Administer morphine 3 mg IV*	7	8.0	12	13.8

* Correct answer

Nurses' practice regarding post-operative pain management

Table 5 presents the frequency and percentage of nurses according to the level of nurses' practice. Overall, nurses reported that they had practiced in pain management for post-operative patients at a moderate level (M = 77.81%, SD = 10.94) by which three-fourths of them indicated that they had practiced in pain management at the moderate (37.9%), high (21.8%), and very high level (16.1%).

In addition, item analysis was conducted (Table 9, Appendix D). The five items with highest and lowest percentage of nurses performed such actions are presented in Table 6. Five items that highest number of nurses reported that they performed, in order, were: (1) Use observation to determine pain; (2) Help to have enough sleep; (3) Teach to support the surgical wound; (4) Help to support pain area, and (5) Provide comfort after surgery. Five items that lowest number of nurses indicated that they performed were: (1) Use pain scale to describe pain intensity; (2) Ask non-pharmacological method to reduce pain; (3) Ask the cause pain become worst; (4) Ask the average pain after surgery; and (5) Ask factors reduce the intensity

of their pain. For item "Use pain scale to describe pain that was performed by 10 nurses (11.5%), when determining which pain scale they used, 8 out of 10 nurses reported the use of "faces pain scale."

Moreover, all nurses gave responses to the open-ended question in the practice questionnaire: "What other things/ activities that you have done to alleviate patient's pain experience after surgery?". When analyzed, these activities were divided into four categories. These were: (1) suggesting patients to read the religious books such as Quran, Gita etc. (45.5%), (2) suggesting patients to use Tasbih-a religious practice (22.7%), (3) positioning comfortably (22.7%) and (4) reassurance (9.1%) (Table 13, Appendix D).

Table 5

Frequency and Percentage According to the Level of Nurses' Practice in Post-operative Pain Management (N = 87)

Level of Nurses' Practice (score)		n	%
Very Low	(<60%)	4	4.6
Low	(60.00-69.99%)	17	19.5
Moderate	(70.00-79.99%)	33	37.9
High	(80.00-89.99%)	19	21.8
Very High	(≥ 90.00%)	14	16.1
M = 77.81%, SD = 10.94, Min = 50%, Max = 97.22%			

Table 6

Five Items with Highest and Five Items with Lowest Percentage of Nurses Performed Pain Management Practice (N = 87)

Nurses ' Pain Management Practice Statements	n	%
Five items with highest percentage performed		
1. Use observation to determine pain	87	100
2. Help promote enough sleep	86	98.9
3. Teach to support the surgical wound	85	97.7
4. Help to support pain area	85	97.7
5. Provide comfort after surgery	84	96.6
Five items with lowest percentage performed		
1. Use pain scale to describe pain intensity	10	11.5
2. Ask non-pharmacological method to reduce pain	45	51.7
3. Ask the cause if their pain becomes worst	49	56.3
4. Ask the average pain after surgery	49	56.3
5. Ask factors that reduce the intensity of their pain	51	58.6

Additional analysis of factors contributing to knowledge and attitudes of nurse and their practices regarding post-operative pain management

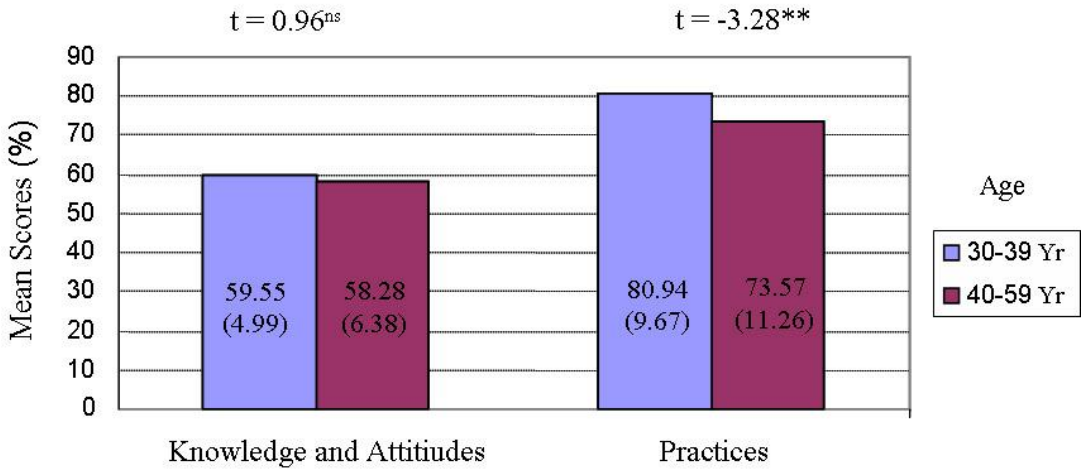
In order to make better understanding on the variables under this investigation, the researcher conducted the additional data analysis to determine whether the following factors may contribute to the level of knowledge and attitudes and the level of practices: age (actual age in years), hospital settings (Hospital A or B), working experience in surgical ward (number of years, 1 year or 2 or more years), and past pain experience (yes or no). The findings are presented as follows (Figure 1-4):

1. Factors contributing to knowledge and attitudes of nurses regarding post-operative pain management

It was revealed that there was no significant age difference in knowledge and attitudes of nurses ($t = 0.96$, $p>.05$). For the hospital settings, the knowledge and attitudes of nurses' scores were not significantly different between two hospitals ($t = -0.43$, $p>.05$). Nurses who had longer duration working in surgical ward (2 or more than 2 years) and only one year experience did not differ in their knowledge and attitudes ($t = -0.40$, $p>.05$). Only nurses who had past pain experience had significantly higher scores than those who did not have ($t = -2.81$, $p<.01$). These comparisons are shown in Figure 1-4.

2. Factors contributing to nurses' practice regarding post-operative pain management

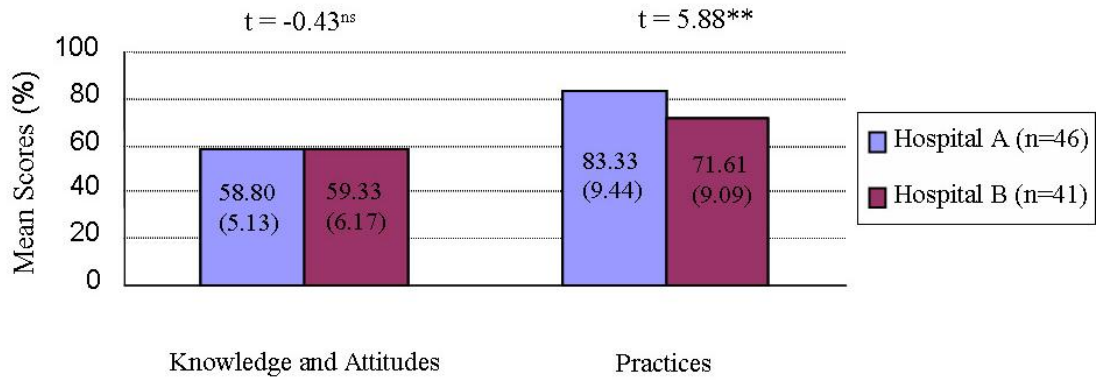
All variables being investigated showed significant relationships with nurses' practices regarding post-operative pain management: with age ($t = -3.28$, $p<.01$); with hospital settings ($t = 5.88$, $p<.01$); with working experience in surgical ward ($t = -2.86$, $p<.01$); and with past pain experience ($t = -2.63$, $p<.01$).



**p<.01, ns=non-significant, df=85

Figure 1

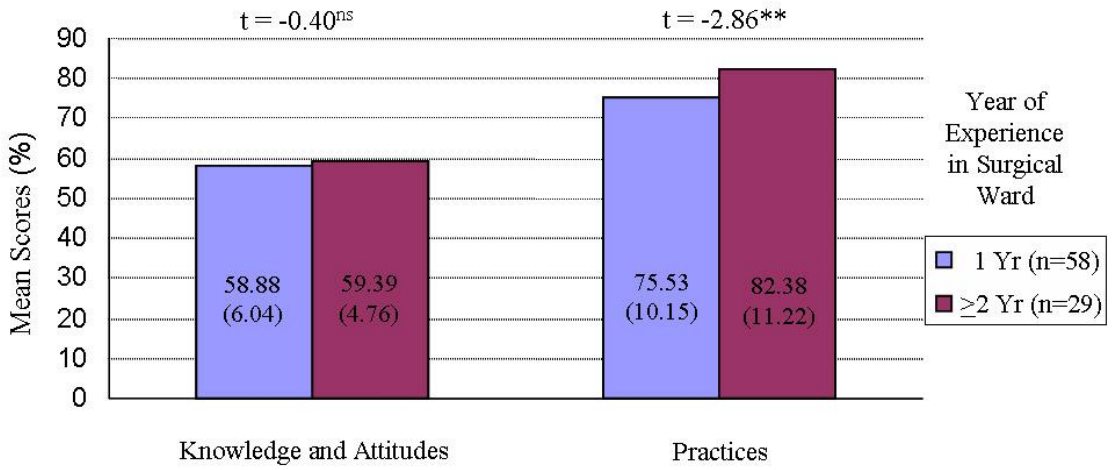
Mean Score Comparison of Knowledge and Attitudes Scores and Practices Scores between Two Age Groups



**p<.01, ns=non-significant, df=85

Figure 2.

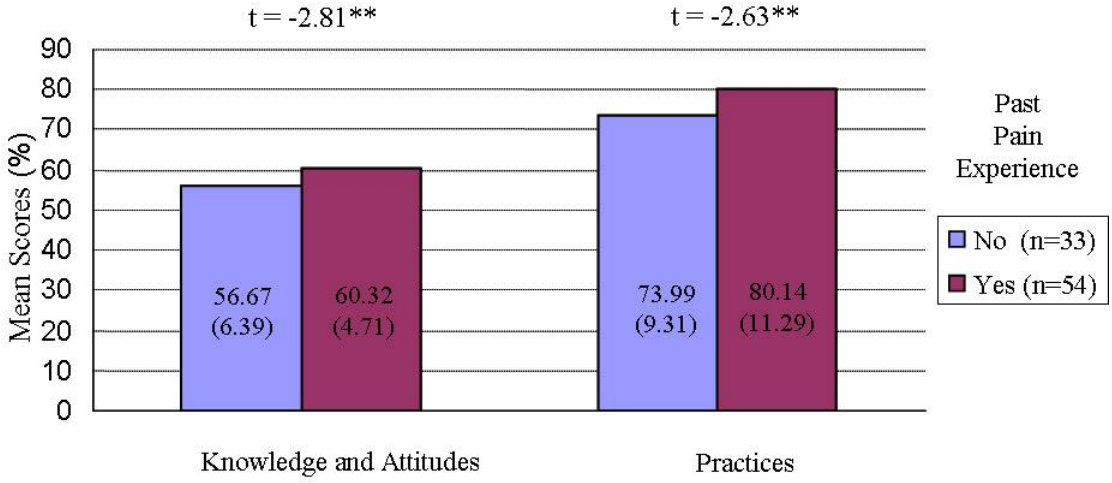
Mean Score Comparison of Knowledge and Attitudes Scores and Practices Scores between Two Hospitals



**p<.01, ns=non-significant, df=85

Figure 3

Mean Score Comparison of Knowledge and Attitudes Scores and Practices Scores between Subjects' Working Experiences in Surgical Ward



**p<.01, df=85

Figure 4

Mean Score Comparison of Knowledge and Attitudes Scores and Practices Scores between Subjects' Past Pain Experiences

Relationship between knowledge and attitudes of nurses and their pain management practices

There was no statistically significant relationship between knowledge and attitudes of nurses and overall pain management practice ($r = .16$, $p>.05$). Regarding the relationship between knowledge and attitudes and the pain management practices' subscales, there were also no significant relationship between knowledge and attitudes of nurses and their practices on pain assessment-evaluation ($r = .16$, $p>.05$), as well as knowledge and attitudes of nurses and their practice on pain intervention ($r = .11$, $p>.05$) (Table 7).

Table 7

Correlation Coefficients between Knowledge and Attitudes of Nurses and Their Practices (N = 87)

Nurses' Practice	Nurses' Knowledge and Attitudes	
	r	p-value
Total Practices Score	.16	.14
Pain assessment-evaluation	.16	.16
Pain intervention	.11	.11

Discussion

Post-operative pain is distressing to a patient undergoing a surgical procedure. Knowledgeable surgical nurses play a key role in alleviating post-operative pain. Nursing education should have prepared nurses to the level that can help nurses be able to manage pain effectively. Nowadays, the baccalaureate nursing programs may offer some formal class contents on pain management. However, the allotted time is inadequate and the curriculum often inaccurate and/or outdated (Clarke et al., 1996).

For nursing education in Bangladesh, the newly developed Bachelor of Nursing Science curriculum and the revised Diploma of Nursing curriculum have been recently implemented in 2008, of which more nursing-focused and patient-centered related contents, including pain are included in both curricula (W. Petpichetchian, WHO consultant, personal communication, September 5, 2009). However, the graduates of these programs have not yet been in the nursing service. The majority of nurses currently working in the healthcare services are diploma-prepared from the previous outdated curriculum as observed in this study (97.7%, Table 1), in which no pain content was taught. In addition, no subjects in this study received or attended any courses or training programs related to pain and its management. This would be a key contributing factor to the findings of this study. Although education about pain does have impact on nurses' knowledge level and change their attitudes, it may not always result in changes in behavior (Twycross, 2007).

It is noteworthy to address that the findings of this study need to be interpreted with caution due to the following facts and observations: (1) nurses participated in the study were from one part of the country, they may not be representatives of all

Bangladeshi nurses; (2) some nurses, though, seemed to be optimistic about this research project as indicated by the high response rate (88%), they might quickly respond to the questionnaire and might provide invalid findings due to their busy working hours; and (3) the researcher distributed the questionnaire and allowed for two weeks to return, this may also have contributed to their answers if there was a discussion among them.

Knowledge and attitudes of nurses regarding post-operative pain management

The present study showed that nurses had very low level of knowledge and negative attitudes regarding post-operative pain management, presenting by the mean score of 59.05% (Table 2) and all, except one, subjects had the level of knowledge very low to low (scores < 70%). This finding was not surprising and was supported by the study of McCaffery and Ferrell (1997) who found that nurses had inadequate knowledge and negative attitudes about post-operative pain management. The finding of this present study was comparable to other studies that also used McCaffery and Ferrell's survey questionnaire, even though the total knowledge and attitudes score was lower than studies in other population. For examples, Clarke et al. (1996) conducted a study with 120 American nurses working in surgical intensive care units, orthopedic units, surgical units, and medical units. They found that the mean score of nurses' knowledge and attitudes was 62%. Matthews and Malcolm (2007) examined the knowledge and attitudes of nurses between two groups of Irish registered nurses. They found a comparable mean scores of nurses in group one (completed training) and group two (had not completed training) of 75% and 72.6%, respectively; and the average mean score of both groups was 73.8%. Two studies were conducted in Asian

countries. The first study was conducted in Indonesia (Tarjuman, 2006). The researcher found that Indonesian nurses had lower level of knowledge than this present study (M = 14.69, equivalent to mean percentage score of 37.67%). She also found that the majority of the subjects (96%) had knowledge and attitudes score less than 50%. Another study was conducted in Hong Kong. Lui et al. (2008) found a deficit in knowledge and attitudes related to pain management among 143 nurses participated in the study with a mean percentage score of 47.72%, ranged from 20-76%. Interestingly, in this Hong Kong's study, most nurses (82.5%) had bachelor degree. It seems that the longer a country has been engaged in efforts to educate health care professionals including nurses (i.e., North American and European Countries), the more likely were nurses from that country to possess higher level of knowledge about pain (McCaffery & Ferrell, 1995). They discussed their finding that it was due to too few hours were assigned for pain content.

Several factors might contribute to the low level of knowledge and negative attitudes regarding post-operative pain management among nurses in this present study. Firstly, there was no subject in the present study had received any course or training program related to pain management. There is no provision in providing in-service education or continuing education on pain topic in Bangladesh. Continuing education programs on pain management have proven helpful in increasing awareness of, and skill in, the area of pain management (Clarke et al., 1996).

Secondly, nearly all subjects in this study had their nursing education at diploma level. The level of nursing education was found to have a positive relationship with the level of knowledge and attitudes as evident in Clarke et al.'s study (1996) and Trajuman's study (2006). Clarke et al. found that master-prepared

nurses had a mean score 10% higher than nurses prepared at the diploma, associate, and baccalaureate level. In Trajuman's study, although the researcher did not examine whether the level of education was correlated with the level of knowledge, it was evident that the majority of subjects in that study had diploma level (79%) and lower nursing degree (18%). It seems likely that basic nursing education would contribute to this finding.

Thirdly, it has been revealed that nurses in Bangladesh have been trained to perform task-oriented nursing actions rather than problem-oriented nursing actions (Hadley & Roques, 2007). This type of nursing care delivery may limit their ability to seek more knowledge or to improve patient care. Fourthly, the overall attitudes of Bangladeshi nurses towards their patients are not in a positive direction as reported in the previous study and nurses in Bangladesh faced many stigmas and were criticized negatively by public in the society (Hadley et al., 2007). This may contribute to the negative attitudes towards their patients and may indirectly affect their pain management.

Moreover, additional analysis findings indicated a small but significant difference between nurses who had past pain experience ($M = 60.32$, $SD = 4.71$) and those who did not have ($M = 56.67$, $SD = 6.39$). This finding may be explained by Holm et al.'s report (as cited in Clarke et al., 1996) that nurses' personal pain experience influenced the way nurses dealt with their patient's pain. This personal experience may drive nurses to seek more information or knowledge to lead them to be able to manage their own problem.

For age, although the test of mean difference was not significant, the older nurses tended to have lower knowledge and more negative attitudes. In other wards,

the older the nurses, the lower were their level of knowledge and attitudes scores. This finding is consistent with the previous study conducted with Thai nurses (Pengjard, Yoosiri, & Petpichetchian, 2003). It may be that nurses served in the service for longer time were reluctant or had less time to update their clinical knowledge as they might have other responsible assignments. For duration of working in surgical ward, this present study found no difference on the variable knowledge and attitudes (Figure 3). This finding is inconsistent with another study. Wilson (2007) found that pain knowledge was significantly correlated with number of years in nursing. This different finding may be due to the restriction of range of "years of working in surgical ward" in this present study (ranged from 1 to 10 years) with the high proportion in "1-year" group (n = 58, 67%).

Additional item analysis of the NKAPQ revealed interesting findings. For items that highest percent of nurses answered correctly, they were in areas that were well-known by Bangladeshi nurses. For examples, the items read, "Benzodiazepines are not effective pain relievers unless the pain is due to muscle spasm" and "Vital signs are always reliable indicators of the intensity of a patient's pain". Regarding the lowest numbers of nurses answered the items correctly in some areas, only 11.5% and 19.5% of nurses did it correctly on the questions that "Patients may sleep in spite of severe pain" and "Non-drugs methods useful for combining with treatment of post-operative pain are relaxation, music, and massage". This may be because the nurses did not know that non-drugs methods could be beneficial in the treatment of severe pain, as well as mild to moderate pain. This is supported by Matthews and Malcolm's study (2007). They found that non-drugs methods are very effective for combining the treatment of pain but only 6% of nurses used non-drugs methods. In addition, Sandal

and Heindal (1999) revealed that nurses had low level of knowledge and attitudes regarding opioids (dosing, adverse effect) and pain management. Moreover, for over the past 20 years, several studies have demonstrated lack of knowledge and attitudes of nurses about pain management in multiple areas, including addiction, opiate properties, adjuvant, ceiling dose of morphine, pain and elders, properties of pethidine, reliability of patient's self report, equilanalgesia, and risk of respiratory depression (de Rond et al., 2001; Textor & Porock, 2006).

The present study showed one unexpected result that more nurses rated pain score correctly for the smiling patient (69%) than for the grimacing patient (62.1%). Unlike the pervious study by McCaffery and Ferrell (1997) who found that for the smiling patient, 73.8% of the nurses recorded correctly and for the grimacing patient 87.1% of the nurses recorded correctly. In the subsequent studies of the same researcher, they found increased numbers of nurses who correctly answered for the smiling patient (85.8% in 1998 and 86% in 2006), and for the grimacing patients (90% in 1998 and 94.6% in 2006) (McCaffery, Pasero, & Ferrell, 2007). This study informs that throughout the years, nurses have improved their knowledge and changed their attitudes towards patients in pain. In addition, in this present study only 2.29% of nurses answered correctly for two case studies in their pain rating score and the decision to provide additional medication. These imply that Bangladeshi nurses may lack of knowledge related to both pain assessment and use of opioids. Similarly, some studies stated that on the first post-operative day nurses administered far less analgesia than the PRN schedule would have permitted; even 91% of patients were in pain (Gillies et al. as cited in Schafheule et al., 2001; Richards & Hubbert, 2007).

Nurses 'practices regarding post-operative pain management

The study presented that nurses had moderate level of practices regarding post-operative pain management, presenting by the mean score of 77.81% (Table 5). Some factors might contribute to the moderate level of practices on pain management among nurses in this present study. Firstly, there was no subject in the present study had achieved continuing education on pain topic in Bangladesh. Continuing education programs on pain management have proven helpful in increasing skill in, the area of pain management (Clarke et al., 1996). Secondly, the basic nursing education of a majority of nurses in this study indicated that nurses might not have adequate knowledge to perform pain management. Thirdly, it has been revealed that nurses in Bangladesh do not provide active hands-on for the direct care of patients (Hadley & Roques, 2007). Moreover, nearly 60 percent of nurses in this present study were Muslim. Muslim nurses in Bangladesh, according to their culture, are less likely to touch their patients (Hadley et al., 2007). This kind of nursing care delivery may be a boundary of effective pain management.

Additional item analysis revealed that some areas that nurses had highly performed in practices because those items were the common actions that nurses could perform easily such as "Using observation to determine patient's pain", " Helping patients get enough sleep", and "Teaching to support their surgical wound and pain area". The result showed that less nurses used pain scale to assess pain intensity. A possible explanation was that Bangladeshi nurses had never used a pain scale for pain assessment and the Numeric Rating Scale was also unknown by nurses. Another pain assessment action less performed by the nurses was "Ask non-pharmacological method to reduce pain". This indicated that nurses may not have adequate knowledge regarding non-pharmacological methods. Similarly, the previous studies found that

nurses seldom used non-pharmacological treatment for post-operative pain relief (Clarke et al., 1996; Manias, 2003).

The present study found that nurses of Hospital A and Hospital B were significantly different in their practice regarding pain management. This may be due to the fact that Hospital A is a larger and a teaching hospital where medical students and nursing students are placed in practice. The practices of teaching physicians regarding pain management in this hospital may different from physicians of Hospital B and that their practices may indirectly influence nurses' practices. In the contrary, Hospital B is a general hospital; nurses may have limited experience in dealing or managing the pain.

All nurses were given the opportunity to identify the practice constraints which may contribute to their inability to perform the actions. The analysis of 'not performed actions' were classified into seven categories combing with pain assessment-evaluation and pain intervention. Overall, the reasons mentioned by some nurses included: had no time, busy by daily activity/ routine work, lack of knowledge, some patients might be angry if they spent time to talk with patients, increase workload, and staff shortage; some of them did not specify the reason (Table 10 and 12, Appendix D).

In addition, nearly half of them mentioned that they suggested patients to read the religious books. It may be that nurses believed that satisfying patient spiritual needs could help them to reduce their pain. Some nurses suggested them to use Tasbih (counting beads). The person who wishes to distract from some point of unwanted situation can practice this. There is a set of Tasbih with one hundred and one or some plastic materials that the person passes through with close attention of mind. Some

nurses suggested the patient to be relaxed. Few nurses used reassurance about what they used to relieve the pain to help the patients reduce their pain (Table 13, Appendix D).

Relationship between knowledge and attitudes of nurses and their practice regarding post-operative pain management

There was no statistically significant relationship between nurses' knowledge and attitudes and their practices. In addition, there was also no significant relationship between nurses' knowledge and attitudes and their pain assessment-evaluation practice, as well as nurses' knowledge and attitudes and their pain intervention practice. These findings are inconsistent with the KAP model which suggests that there is positive relationship between knowledge and attitudes and practices (Launiala, 2009). These findings are also different from the study by Glajchen and Bookbinder (2001) who found that the relationship between nurses' knowledge and subjective competence (practice) was highly significant. These discrepancies might be explained by the following reasons.

For one thing, an observational study conducted by Hadley et al. (2007) reported that nurses in Bangladesh spent only 5.3% of their working time in direct patient care. This finding informs that nurses might not perform such actions that were asked in this present study. However, Bangladeshi nurses may have high social desirability that they just responded to the items in the practice questionnaire to get high scores even they might not perform those practices. Social desirability is a term used to describe the tendency of subjects to reply in a manner that will be viewed favorably by others, according to cultural norms (Adams et al., 2005). This is a continued phenomenon found in many research studies using self-report method. For another,

the Bangladeshi nurses have been trained to perform task-oriented nursing actions rather than problem-oriented nursing actions (Hadley & Roques, 2007). In addition, most nursing actions in the hospital happen to follow doctors' orders. In case of post-operative pain management nurses follow the written pain medication prescription. In other words, nurses may perform their pain management following by doctor's prescription regardless of their knowledge. With this regard, they might do it but did not know "why".

In summary, the findings from this present study presented that most nurses had knowledge and attitudes at a very low level (scores <60%), whereas their practices was at a moderate level (70-79%). There was no significant relationship between knowledge and attitudes of nurses and their practices. Among several factors contributing to these findings, lack of pain contents in nursing education and no in-service training on pain topic seem to play important role.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of the study findings, strengths and limitations of the study, and implications and recommendations for future studies. This descriptive study was to examine the level of knowledge and attitudes of nurses and their practices regarding post-operative pain management, and to examine the relationship between knowledge and attitudes of nurses and their practices towards pain management in Bangladesh. One hundred questionnaires were distributed to nurses who were randomly selected and 87 returned questionnaires were used for data analysis. They were nurses who worked in male surgical units, female surgical units, orthopedic units, ear-nose-throat, gynecology, and private cabins of two public hospitals. Data were collected in January 2010. Collected data were analyzed by using descriptive statistics, and Pearson product-moment correlation. Independent t-test was used for additional data analysis.

Major Findings

This study showed that nurses had very low level of knowledge and attitudes in post-operative pain management in some areas. These included “Patients may sleep in spite of severe pain”, “Non-drugs methods useful for combining with treatment of post-operative pain are relaxation, music, and massage”, “Even the source of the patient’s pain is unknown, opioids can be used during the pain evaluation period”, “Aspirin and other nonsteroidal anti-inflammatory agents are effective analgesics for

acute post-operative pain", and "The patients should be advised to use non-drug techniques concurrently with pain medications".

This study also found that nurses responded to the NCBPQ that they performed most actions regarding pain assessment-evaluation and pain intervention, except in some actions that less nurses performed. These included "Use of pain scales", "Use of non-pharmacological methods", "Ask the cause of pain if it becomes worst", "Ask the average pain after surgery", and "Ask factors reducing the intensity of pain".

In addition, there is no significant relationship between knowledge and attitudes of nurses and their practices regarding post-operative pain management ($r = .16$, $p > .05$).

Strengths and Limitations of the Study

Although this study was conducted at only two institutions, it offers the evidence to further strengthen post-operative pain management in Bangladesh. The homogenous group of nurses, mainly educated at diploma level, provides better insight about nursing education that plays significant contribution to the very low level of knowledge and attitudes of nurses towards pain and its management. Three limitations in this study should be mentioned. First, all nurses in the present study were female, thus, it could not be generalized to male nurses. Second, this study was conducted at Khulna city which is located in southwestern Bangladesh. Even though it is considered to be a large city, it may not be comparable to other large cities such as Dhaka and Chittagong. Therefore, this may limit the generalizability of the findings. Third, this study used a single method to collect data, a self-repot. This

method has limitation in itself, particularly when it is used for rating about human actions. There is a trend towards social desirability of responses. Thus, further study is recommended.

Implications and Recommendations

The findings of the study offer the following implications and recommendations.

Nursing education

It is evident in this study that lack of pain contents in basic nursing education and no pain training course offered to nurses working with surgical patients who are in pain may contribute to the very low level of knowledge and attitudes of nurses. Although the current newly implemented nursing curricula have been in place, efforts should be made to supervise and assess student nurses' competency regarding care of patients in pain during their clinical practice. In order to teach the student nurses, nurse educators should also be trained so that they can teach their students. Thus, the training program regarding pain and its management should be offered to both nurse educators and staff nurses working in the clinical settings, particularly, surgical setting.

Nursing practice

Although these study findings indicated that nurses rated that they performed many actions related to pain management with the moderate level of practices, it may not reflect the real situation as discussed earlier. In some certain practice areas, such as using pain assessment scales, there was no available pain assessment scale at present. An initiative of implementing systematic pain assessment using pain scales

should be started. The findings from the two case studies imply that nurses still tend to assess pain by physical appearance rather than by what the patient says. Hence it is important to equip nurses to develop attitudes that they have to believe in what their patients tell them.

Nursing administration

Nurse administrators can use the findings of this study to request to policy makers for allocating budgets for training nurses regarding pain management in order to improve the quality of nursing care in this area.

Nursing research

A replication study to include male nurses and nurses working in urban/rural hospital is recommended. Future study should employ other methods for data collection such as observation to enhance more valid findings. Also the study with nurse educators should be conducted as they are the most important contributors to nurses' knowledge and attitudes and their practices.

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APPENDICES

APPENDIX A

INFORMED CONSENT FORM

Study Title: Knowledge and Attitudes of Nurses and Their Practices Regarding Post-operative Pain Management in Bangladesh.

Dear participants,

My name is Suparna Basak. I am a master's student of Faculty of Nursing, Prince of Songkla University, Thailand. I am also a senior staff nurse of Khulna Medical College Hospital, Khulna, Bangladesh. I am going to conduct a study to assess the Knowledge and Attitudes of Nurses and Their Practices Regarding Post-operative Pain Management, at two hospitals. This is to fulfill the requirement of the master of nursing program.

The study and its procedures have been approved by the appropriate people and the Institutional Review Board (IRB) of Faculty of Nursing, Prince of Songkla University, Thailand. The study procedures involve no foreseeable risks or harm to you. You are asked to respond to questions about your personal information, your knowledge and attitudes, and your practices about post-operative pain management using the questionnaires.

The information will be used to write a research report. The information will help to develop the nurses' knowledge and attitudes and practices the clinical area.

The information I can gather for the study will be kept confidentiality. Only the investigator and the major advisors are eligible to access the data. Your name and any identifying information will not be used in the report of the study. All the papers of your information will be damaged after completion of the study.

Your participation in this study is voluntary. You have the right to participate or not to participate. You also have the right to withdraw at any time.

Lastly, if you are agreed to participate in the study please sign in and return the questionnaires with appropriate responses. If you do not want to sign in this paper, but respond and return the questionnaires, it will indicate your willingness to participate in the study.

| --- | --- | --- |
(Name of participant)	(Signature of Participant)	Date
(Name of Researcher)	(Signature of Researcher)	Date

APPENDIX B

Demographic Data Form and Knowledge and Attitudes of Nurses Regarding Post-operative Pain Management Questionnaire

Code:……

Date:……Time:……

Hospital:……....

Instruction

Do NOT write your name on this questionnaire. The answer you give will be kept confidential. No one will know about your identity and what you write. Please answer the questions truthfully.

Part 1: Demographic Data Form

Direction: Please put checklist (√) in the correct answer on close-ended questions or write your answer on open-ended questions.

1. Gender

□ 1) Female □ 2) Male

2. Age_____years old.

3. Religion

□ 1) Islam □ 2) Hinduism □ 3) Christian □ 4)……

4. Level of nursing education

□ 1) Diploma degree

□ 2) Bachelor degree

□ 3) Master degree

5. How long have you been taking care of patient in surgical wards?

_____ years _____ months

6. Have you ever got pain experience in your life?

□ 0) No □ 1) Yes

If YES, what kind of pain that you experiences?

□ 1) surgical pain

□ 2) stomachache

□ 3) back pain

□ 4) headache

□ 5) others, please describe……

7. Did you attend any course or training program about pain management after finishing the diploma in nursing education?

□ 0) No □ 1) Yes

If no, what is the reason_____

If yes, where/when, and for how many days?_____

What was the topic?_____

Part 2. Nurses' Knowledge and Attitudes Regarding Post-operative Pain Management Questionnaire

Direction: There are 22 true (T)/ false (F) items. Please circle on the correct answer of each item.

T (F) 1. Vital signs are always reliable indicators of the intensity of a patient's pain.

(T) F 2. Unrelieved acute post-operative pain can result in chronic pain in the future.

……

……

(T) F 22. Narcotic/ opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.

Direction: Please, mark (√) in the correct answer of each following multiple-choice question.

23. The recommended route of administration of opioid analgesics for patients with brief, severe pain of sudden onset such as post-operative pain is

√□ 1) intravenous

. □ 2) intramuscular

□ 3) subcutaneous

□ 4) oral

□ 5) rectal

.....

.....

36. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following:

√□ 1) Sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued.

□ 2) Impaired control over drug use, compulsive use, and craving.

□ 3) The need for higher doses to achieve the same effect.

□ 4) 1 and 2

Case Studies

Two patient case studies are presented. For each patient you are asked to make decisions about pain and medication.

37. **Patient A**: Rahim is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of to 10 (0 = no pain/ discomfort, 10 = worst pain/discomfort) he rates his pain as 8.

A. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Rahim's pain.

0 1 2 3 4 5 6 7 (8) 9 10

No pain/discomfort Worst Pain/discomfort

B. Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6-8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2 as an acceptable level of pain relief. His physicians' order for analgesia is "morphine IV 1-3 mg every 1hr PRN pain relief." Check the action you will take at this time.

□ 1) Administer no morphine at this time

□ 2) Administer morphine 1 mg IV now

□ 3) Administer morphine 2 mg IV now

√□ 4) Administer morphine 3 mg IV now

APPENDIX C

Nurses' Caring Behavior Regarding Pain Management Questionnaire

Part 3: Assessment of Nurses' Caring Behavior in Pain Management of Patient with Post-operative Pain

Direction: Please, mark (√) in the correct answer of each following questions and fills in the blank.

A: Assessment of nurses' perceptions regarding pain assessment-evaluation

1. You used observation to determine patients' pain

□ 0) No □ 1) Yes

2. You asked your patients to determine patients' pain

□ 0) No □ 1) Yes

3. You asked your patients to describe the intensity of pain using a scale

□ 0) No □ 1) yes

If yes, from the following options, which scales did you use?

□ 1) description of pain severity using categorical verbal rating scale (no pain, little pain, moderate pain, severe pain)

□ 2) description of pain intensity using numerical scale from 0-10

□ 3) description of pain intensity using visual analog scale 0-10 or 0-100

□ 4) description of pain intensity using face rating scale

□ 5) others (please specify)_____

……..

.....

18. You asked patients about the side effects of pain medication they experienced such as drowsiness, nausea, vomiting, respiratory problems.

□ 0) No □ 1) Yes

If no, what is the reason_____?

If yes, how often did you do it in a shift?

□1) sometimes □ 2) frequently □ 3) all the time

B: Assessment of nurses' perceptions of pain intervention

1. You gave prescribed pain medication to patients on a fixed schedule, such as every 4 hours or every 6 hours during 24-48 hours after surgery

□ 0) No □ 1) Yes

If no, what is the reason_____?

If yes, how often did you do it in a shift?

□1) sometimes □ 2) frequently □ 3) all the time

…….

.....

18. You provided some alternative things/ activities to alleviate patients pain when they still felt pain

□ 0) No □ 1) Yes

19. What other things/ activities that you have done to alleviate patient's pain experienced after surgery?

If so, please specify

_____

_____

Thank you for your cooperation

APPENDIX D

Table 8

Frequency and Percentage of Nurses Answered Correctly on Each Item of the Nurse's Knowledge and Attitudes Questionnaire (N = 87)

No	Knowledge and Attitudes of Nurses	n	%
1	Vital signs are always reliable indicators of the intensity of patient's pain (F)	65	74.7
2	Unrelieved acute post-operative pain can result in chronic pain in the future (T)	58	66.7
3	Patients who can be distracted from pain usually do not have severe pain (F)	57	65.5
4	Patients may sleep in spite of severe pain (T)	10	11.5
5	Aspirin and other nonsteroidal anti-agents are NOT effective analgesics for acute post-operative pain (F)	22	25.3
6	Respiratory depression rarely occurs in patients who have been receiving opioids over a period of months (T)	63	72.4
7	Combining analgesics that work by different mechanisms (e.g., combining an opioid with an NSAID) may result in better pain control with fewer side effects than using a single analgesic agent (T)	61	70.1
8	The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours (F)	50	57.5
9	Research shows that promethazine (Phenergan) is a reliable potentiators of opioid analgesics (F)	56	64.3
10	Opioids should not be used in patients with a history of substance abuse (F)	54	62.0
11	Morphine has a dose ceiling (i.e., a dose above which no greater pain relief can be obtained) (F)	49	56.3

Table 8 (Continued)

No	Knowledge and Attitudes of Nurses	n	%
12	Elderly patients cannot tolerate opioids for pain relief (F)	64	73.6
13	Patients should be encouraged to endure as much pain as possible before using an opioid (F)	45	51.7
14	Even though elder patients are fully conscious, their self- report of pain are unreliable (F)	60	69.0
15	Patients' spiritual beliefs may lead them to think pain and suffering are necessary (T)	52	59.7
16	After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response (T)	51	58.6
17	Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real (F)	47	54.0
18	Pethidine 75 mg IM is approximately equal to morphine 10 mg IM (T)	62	71.3
19	If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain (F)	21	24.1
20	The patients should be advised to use non-drug techniques alone rather than concurrently with pain medications (F)	29	33.3
21	Benzodiazepines are not effective pain relievers unless the pain is due to muscle spasm (T)	68	78.2
22	Narcotic/ opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving (T)	52	59.8
23	The recommended route of administration of opioid analgesic for patients with brief, severe pain of sudden onset such as post-operative pain is....(intravenous)	62	71.3
24	The recommended route of administration of opioid analgesics for patients with persistent post-operative pain is....(oral)	47	54.0

Table 8 (Continued)

No	Knowledge and Attitudes of Nurses	n	%
25	Which of the following analgesic medications must be used with caution due to its metabolite that can precipitate seizures? .... (pethidine)	62	71.3
26	Which of the following IV doses of morphine administered over a 4-hour period would be equivalent to 30 mg of oral morphine given every 4 hours? ....(10 mg)	54	62.1
27	Analgesics for postoperative pain should initially be given .....around the clock on a fixed schedule	65	74.7
28	A patient with severe post-operative pain has been receiving daily morphine injection for 3 consecutive days. The likelihood of the patient developing clinically significant psychological addiction is..... (low)	50	57.5
29	The most likely reason a patient with pain would request increased doses of pain medications is .....(the patient is experiencing increased pain)	65	74.7
30	Which of the following non- drugs methods are useful for combining with treatment of post-operative pain? ..... (relaxation, music, and massage)	17	19.5
31	The most accurate judge of the intensity of the patient's pain is..... (the patient)	64	73.6
32	Which of the following describes the best approach for cultural considerations in caring for patients in pain: ...(Patients should be individually assessed to determine cultural influences)	33	37.9
33	How likely is it that patients who develop pain already have an alcohol and/ or drug abuse problem?..... (5-15%)	62	71.3
34	The time to peak effect for morphine given IV is .....(15 min)	62	71.3
35	The time to peak effect for morphine given orally is .....(1-2 hours)	51	58.6
36	Following abrupt discontinuation of an opioid, physical dependence is manifested by the following:.....(Sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued)	58	66.7

Table 9

Frequency and Percentage of Nurses Performing Practices of Pain Assessment-Evaluation (N = 87)

No	Items	Perform	
		n	%
1	Use observation to determine pain	87	100
2	Ask patients to determine pain	81	93.1
3	Use pain scale to describe pain intensity	10	11.5
4	Ask patients to evaluate their pain after surgery	73	83.9
5	Ask to locate the area of pain	73	83.9
6	Ask about frequency of their pain experience	61	70.1
7	Ask to describe the pain by own words	77	88.5
8	Ask the most severe pain after surgery	58	66.7
9	Ask the least severe pain after surgery	60	68.9
10	Ask the average pain after surgery	49	56.3
11	Ask presence of any other symptoms	55	63.2
12	Ask the intensity of pain before giving pain killers	83	95.4
13	Ask the intensity of pain after giving pain drug	74	85.1
14	Ask factors increase the intensity of pain	55	63.2
15	Ask factors reduce the intensity of pain	51	58.6
16	Ask the cause if their pain becomes worst	49	56.3
17	Ask non-pharmacological method to reduce pain	45	51.7
18	Ask the side effects of pain medication	72	82.8

Table 10

Frequency and Percentage of Nurses Practices Regarding Pain Assessment-Evaluation Actions Classified by Frequency of Each Action and Reasons (N = 87)

No	Action	n	%
1	Ask to evaluate pain during 24-48 hours after surgery		
	-Performed (n = 73)		
	1time	32	43.8
	2-3 times/shift	18	24.7
	4 times or more	23	31.5
	-The reason, if not performed (n=14)		
	Busy by daily activity	14	100
2	Ask pain intensity before giving pain killer		
	.-Performed (n =83)		
	Sometimes	39	47.0
	Frequently	22	26.5
	All the time	22	26.5
	-The reason, if not performed (n = 4)		
	Have not available time/workload	4	100
3	Ask pain intensity after giving pain killer		
	.-Performed (n = 74)		
	Sometimes	32	43.2
	Frequently	21	28.4
	All the time	21	28.4
	-The reason, if not performed (n = 13)		
	Busy by routine work	8	61.5
	Unknown	5	38.5
4	Ask side effects of pain medication		
	.,-Performed (n = 72)		
	Sometimes	42	58.3
	Frequently	14	19.4
	All the times	16	22.3
	.- The reason, if not performed (n = 15)		
	Unknown	10	66.7
	Have no knowledge about this	5	33.3

Table 11

Frequency and Percentage of Nurses Performing Practices of Pain Intervention (N = 87)

No	Items	Perform	
		n	%
1	Give prescribed pain medication on a fixed schedule	79	90.8
2	Give medication as necessary	83	95.4
3	Explain the pain experience after surgery	62	71.3
4	Teach alternative methods to reduce pain	54	62.1
5	Explain side effects of pain medication	68	78.2
6	Suggest and explain drug addiction to reduce fear	58	66.7
7	Teach the importance of pain evaluation	63	72.4
8	Provided comfort after surgery	84	96.6
9	Help to position comfortably after surgery	84	96.6
10	Help patients when they need help	84	96.6
11	Help to have enough sleep	86	98.9
12	Spend time to reduce pain after surgery	72	82.8
13	Teach patients to perform distracted activities	64	73.6
14	Help to ambulate such as sitting up	82	94.3
15	Teach to support their surgical wound	85	97.7
16	Help to support pain area	85	97.7
17	Take care of patients' wounds	76	87.4
18	Provide alternative activities to alleviate pain	55	63.2

Table 12

Frequency and Percentage of Nurses' Practices Regarding Pain Intervention Regarding Classified by Frequency of Each Action and Reasons (N = 87)

No	Action	n	%
1	Give pain medication on a fixed schedule		
	-Performed (n = 79)		
	Sometimes	38	48.1
	Frequently	22	27.8
	All the time	19	24.1
	.-The reason, if not performed (n = 8)		
	Unknown	3	37.5
	No enough time	5	62.5
2	Give medications as necessary		
	.-Performed (n = 83)		
	Sometimes	33	39.8
	Frequently	28	33.7
	All the time	22	26.5
	-The reason, was not performed (n = 4)		
	Busy by routine work	4	100
3	Spend time talked to patients		
	-Performed (n = 72)		
	1 time	36	50.0
	2-3 times	25	34.7
	4 times	11	15.3
	- The reason, was not performed (n =15)		
	Patient might be angry if they talk	5	31.2
	Increase workload	8	50.0
	Unknown	2	18.8
4	Help to support pain area		
	Performed (n = 85)		
	1 time	40	47.1
	2-3 times	17	20.0
	4 times	28	32.9
	-The reason, was not performed (n = 2)		
	Being occupied by daily activity	2	100
5	Take care of surgical wound		
	-Performed (n = 76)		
	1 time	33	43.4
	2-3 times	20	26.3
	4 times	23	30.3
	-The reason, was not performed (n = 11)		
	Staff shortage	11	100

Table 13

Frequency and Percentage of Nurses Performing Additional Actions to Alleviative Patient's Pain (N = 87)

N0	Additional Actions	n	%
1	Suggesting the patient to read the religious book	40	45.5
2	Suggesting the patient to use Tasbih	20	22.7
3	Keeping the patient in comfortable position	20	22.7
4	Encouraging the patient	7	9.1

APPENDIX E

From: "Ferrell, Betty" <BFerrell@coh.org

To: basaksuparna@ymail.com

Sent: Monday, July 27, 2009 9:52:37 PM

Subject: Re: Questionnaire of "Knowledge and Attitudes Survey Regarding Pain"

All of our instruments are on our website http://ptc.con.org in the section titled Research instruments. You are welcome to use or adapt any our tools. Betty Farrell

From: Basak Suparna
To: Ferrell, Betty
Sent: Mon Jul 27 06:49:21 2009
Subject: Questionnaire of "Knowledge and Attitudes Survey Regarding Pain"
Dear, Dr. Ferrell,

First of all, I would like to introduce myself. I am a senior staff nurse of Bangladesh, name-Suparna Basak. Now I am studying in Master of Nursing Science, International Program at Faculty of Nursing, Prience of Sangkla University, Thailand. I will conduct my master's thesis about knowledge and attitudes of nurses and their practices regarding postoperative pain management. I am interested in using your instrument regarding "nurses' knowledge and attitudes survey of pain". So, I would like to ask you to give me permission for using your instrument. I am looking forward to your answer. May god bless you.

Yours Sincerely,
Suparna Basak

APPENDIX F

EXPERTS OF CONTENT VALIDITY INDEX

Nurses' knowledge and attitudes regarding post-operative pain management questionnaire and nurses' caring behavior pain management questionnaire was validated by three experts. They are

1) Dr. Kaliproshed Sarker

   Associate Prof, (Department of Surgery) Khulna Medical College Hospital, Khulna

2) Asma Khatun (Master-prepared nurse administrator) Nursing College, Khulna

3) Morgina Begum (Master-prepared staff nurse) Khulna Medical College Hospital, Khulna

VITAE

Name Suparna Basak

Student ID 5110420089

Educational Attainment

Degree	Name of Institution	Year of Graduation
Bachelor of Nursing Science	Mohakhali, Dhaka, Bangladesh	2005
Diploma in Nursing	Nursing Institute, Comilla Bangladesh	1991

Scholarship Award during Enrollment

Ministry of Health and Family Welfare, Government of the People Republic of Bangladesh (2008-2010)

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