NURSES' KNOWLEDGE AND PRACTICES RELATED TO PAIN ASSESSMENT IN CRITICALLY ILL PATIENTS AT MULAGO HOSPITAL, UGANDA

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MSN (Critical Care and Trauma) Dissertation

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled ***Nurses' knowledge and practices related to pain assessment in critically ill patients at Mulago Hospital, Uganda,*** in partial fulfillment of the requirements for the degree of Master of Nursing (Critical Care and Trauma) of Muhimbili University of Health and Allied Sciences.

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DEDICATION

I dedicate the report to my family ; Dr. Katumba Jerome (husband) , Joshua and Joseph (sons) , Ms. Elizabeth Mawemuko (mother) and Mr. Paul Namuyimba (father) for their physical and emotional support provided throughout my endeavors. And to baby Solomon, for he has been instrumental in the whole process.

ABSTRACT

Nurses' knowledge and practices related to pain assessment in critically ill patients at Mulago National Hospital, Uganda.

Critically ill patients experience moderate to severe acute pain which minimizes their comfort. If inadequately managed, acute pain leads to negative physiological and psychological sequelae including the development of chronic pain syndromes. Optimal pain relief is reliant on nurses' systematic and consistent assessment, and regular documentation of pain. Research related to nurses' knowledge and practices regarding pain assessment in the critical care setting remains limited. There has been no study in Uganda about nurses' knowledge and practices related to pain assessment among critically ill patients. The study was designed to describe nurses' knowledge, practices and barriers related to pain assessment for critically ill patients at Mulago National Hospital.

Methodology:

A descriptive cross-sectional study design was employed. Data was collected using a semi-structured questionnaire from a convenient sample of 170 nurses caring for critically ill patients at Mulago Hospital. The study was approved by ethical committees at Muhimbili University of Health and Allied Sciences and Mulago Hospital.

Analysis: Data was analyzed using SPSS version 14.0. Results were summarized using frequencies and percentages, and presented using figures, tables and text.

Results: Majority (90%) of the participants reported to assess pain among critically ill patients but almost all of them (96%) do not use pain assessment tools. More than three quarters (79.1%) of the participants who assessed for pain documented findings after assessment. Majority of the participants (91.2%) had adequate knowledge. Almost half lacked knowledge on key pain assessment principles ; 43.5% mentioned people other than the patient as the most accurate in rating the pain intensity for the patient, and 44% do not always agree with patients' statements about pain. Barriers to pain assessment included; nursing workload (84.1%), lack of availability of assessment tools (74.1%), lack of education on assessment tools (82.4%) , lack of familiarity with tools (78.2%) , lack of protocols and guidelines on pain assessment and management (74.1%), poor documentation of pain assessment and

management (77.6%) and poor communication of pain assessment priorities at the unit (74.7%).

Conclusion

Assessment and documentation of pain is done by majority of nurses. However, assessment tools are minimally used. Nurses had adequate knowledge on pain assessment. However, almost half of them did not know that it is the patient who best assesses their pain and do not always agree with patients' statements on pain. This is a knowledge gap which can affect practice. Perceived barriers included; lack of guidelines and protocols, assessment tools, documentation charts and education on assessment tools, poor documentation of pain assessment and management, and poor communication of pain assessment priorities at the unit.

Recommendations

There is need of a multifaceted approach by Ministry of Health, hospital leadership, nurse leaders, Nursing Council , clinical nurses and nurse- educators to; conduct a continuous professional education program on pain assessment for nurses caring for critically ill patients. In addition, introduction of pain assessment tools, guidelines and protocols, and charts for documentation that are appropriate to the setting coupled with practical training and support supervision is recommended. A mixed methods research exploring the actual practices is recommended.

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LIST OF ABBREVIATIONS:

HDU	:	High Dependency Unit
IASP	:	International Association for the Study of Pain
ICU	**:**	Intensive Care Unit
MakCHS	:	Makerere University College of Health Sciences
MUHAS	:	Muhimbili University of Health and Allied Sciences
MNRTH	:	Mulago National Referral and Teaching Hospital

DEFINITIONS OF TERMS

Acute pain- Is pain of recent onset and probable limited duration. It usually has an identifiable temporal and causal relationship to injury or disease (Macintyre, Schug, Scott, Visser, & Walker, 2010)

Pre-emptive analgesia – Is defined as administration of an analgesic prior to an acute pain stimulus such as a procedure performed among critically ill patients that is known to be painful (Macintyre et al., 2010). It is the responsibility of the staff caring for the critically ill patient to anticipate painful interventions and procedures such as physiotherapy and administer additional analgesia as appropriate (Ashley, 2009)

OPERATIONAL DEFINITIONS

Critically ill patient - Is a patient with life – threatening health problems. Such a patient has high levels acquity and complex care needs condition and requires constant physiological monitoring, observation, intervention and evaluation.

Knowledge - Is the awareness of the nurse about the key principles related to pain assessment among critically ill patients.

Practice - Is the performance of interventions based on principles related to pain assessment and management among critically patients

CHAPTER ONE

1·0 INTRODUCTION AND BACKGROUND:

Maintaining an optimal level of comfort for critically ill patients is a universal goal for physicians and nurses because pain is one of the major experiences that can minimize patients' comfort. These patients experience pain from preexisting diseases, invasive procedures, or trauma (Arif & Grap, 2009). Pain assessment is the first step in proper pain relief, an important goal in patients 'care (Gelinas, Fillion, Puntillo, Veins, &Fortier, 2006). According to the International Association for the Study of Pain [IASP] (1979), pain is an unpleasant sensory and emotional experience associated with actual or potential damage or described in terms of such damage. This is the mostly widely recognized definition. It is a sensation that is strictly subjective in nature. McAffery defined pain as whatever the experiencing person says it is, existing whenever the experiencing person says it does (McCaffery, 1968, as cited in Pasero, 2009). This exemplifies the importance of the patient's perspective and input, which supports the individual's self report as the single most reliable indicator of the existence and severity of pain (Pasero, 2009). The self- report of pain is the gold standard of pain assessment given the subjective nature of pain (Pasero, 2009).

Inadequately managed acute pain has a negative impact on many organ systems, as well as negative physical and psychologic consequences for patients of all ages (Bower & Reuter, 2009). Physical pain may not be the only consideration, as psychological factors such as fear, anxiety, demoralization, a feeling of helplessness, depression, fatigue, loss of control and sleep disturbance may also contribute to the patient's overall pain experience (Cousins, Brennan, &Carr, 2004). Reduced mobility commonly induced by the fear that any movement may cause pain, increases the liability of deep vein thrombosis and thus, thrombo-embolism, risk for pressure sores and promotes muscle atrophy (Ann, 1995; Thomas, 2008).

Impaired sleep among such patients contributes to development of delirium, depression, anxiety and post traumatic stress disorder [PTSD] (Ely, Shintani, Truman, Speroff, Gordon, &

Harrell, 2004). Pain can compromise recovery and negatively affect both morbidity and mortality because of such effects (Rose, Haslam, Dale, Knechtel, Fraser, & Pinto, 2011). The delayed recovery of these patients results in increased demand on the hospital resources. Increasing evidence points to the development of chronic pain syndromes in individuals (both adult and paediatric) where acute pain is unrelieved because it elicits patho-physiologic neural sensitization, including peripheral and central neurons of the nervous system (Boyle, Murgo, Adamson, Gill, Elliot, & Crawford, 2004; Siddal & Cousins, 2004; Thomas, 2008).

The advantages of good analgesia are particularly important for critically ill patients because of its physiologic and psychologic benefits. The ability to deep breath and cough with minimal pain and discomfort enhances respiratory function, facilitates physiotherapy, expedite weaning from mechanical ventilation and encourages earlier mobilization, prevents thrombo-embolic complications and facilitates rapid recovery and discharge to the ward environment. This inevitably decreases complications and a protracted hospital stay (Ashley, 2009).

In light of this evidence, proficient pain management for critically ill patients is a significant factor in meeting their needs and maximizing the chance of recovery (Shannon & Bucknall, 2003). To emphasize this, the American Pain Society identifies pain assessment as the fifth vital sign (Zimmermann, 2006). Adequate pain control is also considered as a basic human right, humane, and neurohormonally beneficial to the patient (Brennan, Carr, & Cousins, 2007; Thomas, 2008). Therefore, provision of pain management and comfort to all patients able and unable to communicate by health care professionals is an ethical issue (Herr, Coyne, Key, Manworren, McCaffery, Merkel, Pelosi- Kelly, & Wild, 2006).

Optimal pain relief through appropriate prescribing of analgesia is reliant on systematic assessment and regular documentation of pain by nurses (Rose et al., 2011). This implies that nurses are integral to the effective inter-professional management of pain and this has made pain assessment and management an important outcome when evaluating effectiveness of nursing care. To achieve quality pain assessment, nurses need to have an understanding of the

underlying condition and adequate knowledge of the principles of assessment coupled with careful pain assessment and appropriate selection of suitable techniques and tools (Ashley, 2009).

Clinicians' (nurses inclusive) knowledge and practice of principles related to assessment and management of pain for critically ill patients constitute the core and essential elements of controlling the complex experience (Francesca, Bander, Echlte, Guinta, & Williams, 2003). Therefore examining these elements is a paramount step in constructing a foundation for better strategies in effective management of pain, ensuring patients' comfort and ultimate improvement of nursing practice.

1.1 Problem statement

Critically ill patients experience moderate to severe pain and often, in the face of life-threatening illness or injury, pain and its treatment are forgotten, or at least under-appreciated by the health care team (Puntillo, 1990; Bruster , 1994; Gelinas, 2007). It has also reported that 64% of such patients recall having pain as a stressful experience during their critical care unit stay (Granja, Lopes, Moreira, Dias, Costa-Pereira, & Carneiro, 2005). Despite pain being a significant problem within the critical care environment, the issue has not been adequately addressed by critical care nurses (Shannon & Bucknall, 2003).

Clinician-related barriers, including knowledge deficits regarding pain assessment and management principles, failure to assess and acknowledge the existence of pain, personal and cultural bias, and communication difficulties between the patient and the health-care team, contribute considerably to suboptimal pain management among critically ill patients (Pasero, Puntillo, Li, Mularski, Grap, & Erstand et al., 2009).

Inaccurate pain assessment and the resulting inadequate treatment among critically ill adults have been found to have serious physiological and psychological sequelae (Lewis,Whipple,Michael, & Quebbeman, 1994; Ljungqvist, Nygren,Soop, & Thorell ,2005 ; Turina,Miller,Tucker & Polk ,2006; Thomas, 2008) . The cornerstone to adequate pain relief among patients is systematic and consistent assessment and documentation. Therefore, it is imperative that health care providers assess pain accurately in the critically ill patients (Arif-

Rahu & Grap, 2010). Research related to nurses' knowledge and practices regarding pain assessment in the critical care setting remains limited despite an increased awareness of the significance of pain for the critically ill patients (Shannon & Bucknall, 2003). There has been no documented study in Uganda reporting nurses' knowledge and practices related to pain assessment among critically ill patients as well as barriers to effective practices.

1.2 Statement of purpose:

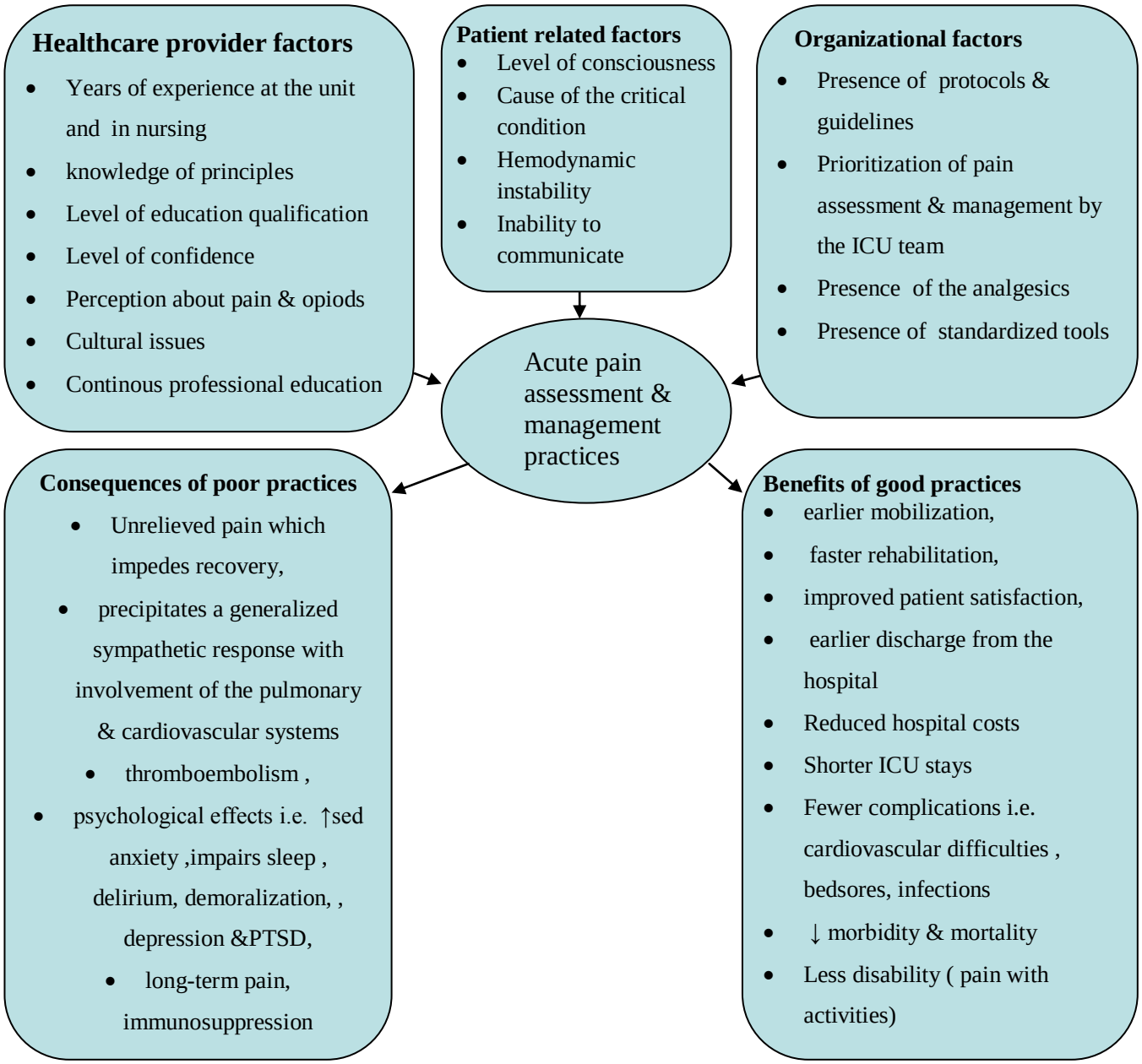
The purpose of this study was to generate data required to gain insight of nurses' knowledge and practices for pain assessment and to determine the direction of future interventions.

1.3 Study Justification

Pain assessment with ultimate effective management, is one of the most important aspects of patient care and is relevant to all nurses. Since much of the responsibility for the patients' comfort rests with the nurses, they need to have solid foundation of knowledge and skills about pain assessment as well as positive attitude towards that aspect of care. This enables them to assess patients' condition and deliver individualized care to each patient so as to reduce discomfort and enhance the quality of life. To improve both the quality of care and healthcare outcomes or quality of life of critically ill patients, there is need to investigate the level of knowledge and practices related to pain assessment among their nurses as well as barriers to practices. Based on the findings, strategies to improve the knowledge and practices of pain assessment among nurses may be designed, implemented and evaluated ultimately reducing or preventing patients' suffering through improved nursing practice. Also protocols and policy guidelines may be formulated to improve nursing practice. Approaches to strengthen enablers and reduce identified barriers may be implemented.

Figure 1: Conceptual frame work:

Conceptual frame work for enablers, barriers and consequences of acute pain assessment and management practices for critically ill patients.



The scope of this study included knowledge, practices, and barriers related to pain assessment among nurses caring for critically ill patients. The researcher developed the framework using the literature accessed. It guided the researcher in understanding the literature around the study.

1.3.1 Research Questions

i. What are the pain assessment practices among nurses caring for critically ill patients at Mulago Hospital?
ii. What is the level of knowledge related to pain assessment among nurses caring for critically ill patients at Mulago Hospital?
iii. What are the barriers for pain assessment among nurses caring for critically ill patients at Mulago Hospital?

1.5.0 Study objectives

1.5.1 General objective

The broad objective of the proposed study was to explore nurses' knowledge and practices related to pain assessment for critically ill patients at Mulago National Hospital.

1.5.2 Specific objectives

The specific objectives of the proposed study included the following:

i. To determine pain assessment practices among nurses caring for critically ill patients at Mulago National Hospital.
ii. To examine the level of knowledge related to pain assessment among nurses caring for critically ill patients at Mulago National Hospital.
iii. To identify the barriers for pain assessment among nurses caring for critically ill patients at Mulago National Hospital.

CHAPTER TWO:

2.0 LITERATURE REVIEW

2.1 Acute pain among critically ill patients

Effective management of acute pain among critically ill patients is important in the maintenance of their dignity (Herr, et al., 2006). Pain is difficult to assess and manage because of being inherently a subjective experience influenced by multiple factors. The patient's perception, expression, and tolerance of pain may vary because of different psychological and social influences (Miller &Newton, 2006). Evidence of ethnic differences in pain perception has also been reported (Rahim-Williams, Riley, Herrera, Campbell, Hastie, & Fillingim, 2007). This makes pain an individualized experience with many dimensions (Bower & Reuter, 2009) and nurses need to remember that in their practice. It is therefore important for health care providers to assess for pain so that individualized management interventions can be provided (Arif & Grap, 2009).

Assessing and managing of pain in the critically ill patients may present particular challenges for nursing and medical staff, as a patient may experience pain from many sources. It has been reported that 78% of all patients that arrive at the emergency department present with pain (Tanabe, Buschmann, & Forest, 2000). Not only do these patients experience pain from pathological disease process, trauma or surgery, they may also undergo invasive procedures. It is estimated that as many as 70% of critically ill patients experience at least moderate intensity procedural-related or postoperative pain during their stay in the hospital units(Brennan,et al., 2007 ; Gelinas, 2007).

These procedures vary according to the type of recovery or intensive care unit but may include the insertion of endo-tracheal tubes, non-invasive ventilating devices, invasive monitoring lines, central venous catheters, chest drains, nephrostomy tubes and dialysis catheters. Procedural pain may also be experienced from routine nursing care like airway suctioning , dressing changes and patient positioning or turning , and moving such as when

the patient is washed, repositioned in bed as X-rays are carried out or physiotherapy is performed and prolonged immobility (Puntillo, White, Morris, Perdue, Stanik-Hutt,& Thompson, 2001; Arif & Grap,2009). However, procedural pain in emergency, recovery or on the intensive care unit is frequently not considered and therefore analgesia not given in anticipation of patient discomfort during line insertion, suctioning and so on (Ashley, 2009).

Critically ill patients have a right to pre-emptive analgesia. It is among the scientific practices or principles for pain management (Macintyre, et al., 2010). Assessment and management of procedural pain may be influenced by many factors some of which are attitudinal and educational. Findings of a study in Canada among 140 critical care nurses showed that majority of the nurses rated pain assessment as moderately and extremely important for line insertion, wound care, repositioning, drain remove and suctioning (Rose, et al., 2011). However, the findings for the practice differed as fewer nurses rated assessment of pain during suctioning and repositioning occurring more than 50% of the time during the performing of the procedures in the their units (Rose et al , 2011). This may indicate that knowledge about the need to assess for procedural pain was adequate but was not translated in to pain assessment practices.

2.2 Consequences of poorly managed acute pain by organ system among critically ill patients:

Inadequately managed acute pain has major physiological, psychological, economic and social ramifications for patients, their families and society (Brennan, et al., 2007). Physiologically, unrelieved pain has been found to affect almost all the systems in the body because it precipitates a generalized sympathetic response (Thomas, 2008).

In addition to what has been mentioned earlier , other physiological consequences include; immune-suppression with increased susceptibility to disease and dependence on medications ; tachycardia, increased myocardial oxygen demand with increased cardiac ischemia in susceptible patients due to an imbalance between myocardial oxygen demand and supply,

blood pressure(hypertension) , decreased cerebro-vascular auto-regulation, increased intracranial pressure and increased and prolonged catabolic response ((Siddal & Cousins, 2004; Ljungqvist,et al.,2005 ; Turina et al., 2006 ; Thomas,2008) . Unrelieved pain may result in lung collapse due to reduced movement of the diaphragm and chest wall resulting in hypoxia, hypercarbia, decreased cough, decreased vital capacity and functional residual capacity, pneumonia, ventilation- perfussion mismatching and respiratory failure with prolonged mechanical ventilation and ICU stay (Desai, 1999; Thomas, 2008). Complications in the gastrointestinal system include; anorexia, nausea, vomiting and post-operative ileus (Ann, 1995; Thomas, 2008).

In summary, pain, the unnecessary discomfort, has debilitating effects that can affect patients physically, emotionally and spiritually and can alter their quality of life. On the other hand , good pain control is not only more pleasant for the patient but can also lead to earlier mobilization, faster rehabilitation, improved patient satisfaction, and earlier discharge from the hospital (Bourne, 2004; Maheshwari, Boutar, Yun, Sirianni, & Dorr, 2006 ; Peters, Shirley, & Erickson,2006 ; Ritsema, Kelen, Pronovost, & Pham, 2006) .

A key issue to remember is that adequate pain relief is unattainable without adequate assessment. Findings of a study at Muhimbili Orthopedic Institute in Tanzania showed that of the 156 patients who scored their pain as moderate to severe, 76.5% rated their pain at the same level even after analgesic administration (Haonga, Makupa, Muhina, & Nungu 2009). Only 18% received analgesia within 20min of admission. If pain is well assessed and analgesics prescribed and administered according to the assessment scores of pain, then complete relief can be attained and consequences prevented.

2.3 Pain assessment among critically ill patients

Among the key principles recommended for effective pain management is routine pain assessment and assessment of the effectiveness of interventions (Watt-Watson, Clark, Finley, & Watson, 1999). Assessment of acute pain refers to the comprehensive clinical process of

describing pain and its effect on patient function in sufficient detail to achieve: assistance in diagnosis and extent of injury or disease, selection of appropriate therapy and evaluation of response to therapy. It requires the practitioner to use a particular type of pain assessment tool (Brown, 2008).

Pain assessment in critically ill patients is more difficult, and conventional pain assessment tools, not always appropriate. Because pain is first recognized as a subjective experience, the patient's self-report of pain represents the most valid measure of pain and must be obtained whenever possible. Standardized tools promote consistency among care providers and care settings; enhance communication between patients and practitioners by making a subjective experience measurable, and facilitate evaluation of pain management decisions (Herr, et al., 2006).

Several tools are available to ensure that appropriate pain assessment is done well. One of the methods used in assessing the patient's pain is the mnemonic PQRSTU. It helps in conducting a comprehensive interview about pain (Arif & Grap,2009). The letters standing for provocation or position, quality, radiation, severity of pain and other symptoms associated with pain, timing or triggers and understanding of pain by the patient respectively. After the pain experience has been well described, the nurse routinely or regularly monitors the intensity of pain, which can be measured by various scales. Numerical rating scale (NRS ; 0-10), FACES pain scale and Visual Analong Scale (VAS) are among the commonly used scales for subjective pain measurement with a patient who can self report pain either verbally or other means like pointing or nodding the head once shown the scale (Arif & Grap, 2009).

Frequency of observation of pain as the 5^{th} vital sign should depend on the intensity of the pain, the type of therapy used to treat it and the need to evaluate that therapy. Dynamic pain should be assessed, particularly the patient's ability to cough and to move the affected body part. Pain at rest is also relevant as this can give an indication about how well a patient will be able to sleep (McMain, 2008).

The inability to communicate verbally does not negate the possibility that an individual is experiencing pain and in need of suitable pain relieving treatment. This emphasizes the need for appropriate assessment of pain among non-verbal patients (Macintyre et al, 2010).

To date, there is no a universal pain assessment tool that is suitable for all critically ill patients(Shannon & Bucknall,2003 ; Rose, et al., 2011) Therefore the appropriateness of a scale must be assessed patient by patient and no one scale should be institutional mandate for all patients in a certain group. Elements of a variety of different tools may be required according to the condition of the patient (Shannon & Bucknall, 2003). A simple tool, which is straightforward and not too time consuming, is valuable in the critical care environment (Shannon& Bucknall, 2003). The American Pain Society guidelines also mandate evaluation of both physiological and behavioral response to pain in patients who are unable to communicate (Herr, et al, 2006).

2.4 Knowledge related to pain assessment and management among critically ill patients

Clinicians need a wide base of knowledge about pain, its assessment and management principles, and consequences of inadequately managed pain among other concepts about pain. However, studies show that nurses and other health workers lack adequate knowledge about pain underestimate pain provide inadequate analgesia (Watt-Watson, Stevens, Garfinkel, Streiner, & Gallop, 2001) and document pain infrequently (Watt-Watson, et al., 1999).

Knowledge deficits regarding pain assessment and management principles has been cited as one of the clinician-related barriers to optimal pain management among critically ill patients, and critical care nurses' recognition that they have inadequate pain assessment knowledge has been considered as a key step towards improvement of pain management (Pasero et al., 2009).

In a study aimed at determining the knowledge and practices among 200 clinicians (170, 87% nurses) who managed post-operative pain at the Moi Teaching and Referral Hospital in Kenya, only 41% of nurses indicated that they had sufficient knowledge to recognize and manage pain(Kituyi, Imbayo,Wambami,Sisenda , & Kuremu ,2011). In the same study, 21%

of all the participants had never had any formal teaching in relation to pain evaluation and management. In addition, findings showed that duration of service among all the health care providers in the post-operative care units did not influence the respondents' knowledge and confidence in the evaluation and management of pain (Kituyi, et al., 2011). In the article, it is not indicated how the knowledge level was assessed. It appears like clinicians were asked to report whether they felt having adequate or inadequate knowledge. It can provide some insight but if scored questions where used to assess level of knowledge, may be the percentage may even be less.

Findings of a study on nurses' pain practices for pain assessment for critically ill patients unable to verbally communicate their pain in Turkey showed that of the 91 nurses, 85.7% stated that the most correct pain assessement would be made by the patients themselves. However, only 29.7% based their assessment on the patients' own communication (Aslan, Badir, & Selimen, 2003). The authors felt that this finding clearly indicated inadequate knowledge of pain assessment management principles. In addition, 57.1% of the nurses failed to administer the analgesics immediately but waited until after verification of the extent of pain in cases where the patients made their pain known to the nurses. This shows how knowledge was not translated into practice. In the same study, only 14.3% of the subjects had received pain management education and this was during student training (Aslan, et al., 2003).

Such findings may imply that the only way to improve knowledge and practice is through education. One of the documented approaches to pain management improvement process is conducting knowledge and attitude surveys among physicians, nurses, and pharmacists which will uncover gaps in knowledge as well as personal beliefs that may be contributing to the inadequate pain assessment and under treatment of pain. The initial responses to such surveys form the basis for a comprehensive, multidisciplinary education plan (Pasero, et al., 2009).

In another study that was designed to examine the relationship between nurses' knowledge and beliefs about and patients' outcomes related to pain and analgesic intake, findings showed that among 80 nurses for cardiac postoperative patients, the level of knowledge was moderate for majority. About 53% of the nurses scored 69% or less with the Toronto Pain Management

Inventory (TPMI) tool with only 15% scoring 75% or greater (Watt-Watson, et al., 2001). No significant differences were evident between the groups of nurses with high and low scores for nurses characteristics like age, nurses' work and unit experience, education level or pain ratings. Nurses with more knowledge did not have patients who experienced less pain during the previous 3- hour period of their assignment. However, a weak positive correlation was evident between pain knowledge and continuing education despite 84% of nurses having had little pain related in-service education.

2.5 Practices related to pain assessment among nurses for critically ill patients

Quality pain management begins with a thorough assessment, reassessment and documentation to facilitate treatment and communication among health care providers (Arif & Grap, 2009).

Despite the fact that they spend more time with patients in pain than any other member of the health care team, nurses are sometimes cited as contributors to the problem of inadequate pain management (Richards & Hubbert, 2007). This may happen when nurses fail to appropriately assess, manage or evaluate pain and pain- related side effects (Shannon & Bucknall, 2003). One of the biggest obstacles to pain management among critically ill patients is pain assessment (Odhner, Wegman, Freeland, Steinmetz, &Ingersoll, 2003). Therefore, shortcomings in pain management begin with a failure of recognition. Good pain assessment requires consistent use of a valid and reliable instrument (Shugarman, Goebel, Lanto, Asch, Sherboure, & Lee, et al., 2010). It has also been noted that pain is often not assessed in ways consistent with current practice recommendations (Herr, Titler, Schilling, Marsh, Xie, & Ardey et al., 2004; Dihle, Bjolseth, & Helseth, 2006), thus hindering successful pain management. This may imply that the reported under treatment may possibly be due to problems associated with recognition or assessment among other reasons (Shugarman et al., 2010).

To guide nurses in obtaining of self- report of pain in critically ill patients, recommendations have been clearly stated (Kwekkeboom & Herr, 2001). A nurse has to start by asking the patient if he/she has pain or not. If pain is present, the nurse then focuses on the intensity of

pain and if no specific tool is recommended by the institution, he/she selects a tool appropriate for the patient and most feasible to use (Kwekkeboom & Herr, 2001). The nurse has to make the environment as quite as possible and allows sufficient time for the patient to respond and three attempts should be made before concluding that the patient is unable to self-report the pain (Kwekkeboom& Herr, 2001). Use of the same scale each time the patient's pain is assessed is recommended (Kwekkeboom& Herr, 2001). Pain intensity should be assessed on a regular basis, before and after pain management interventions and findings must be recorded and its documentation easily accessible (Kwekkeboom& Herr, 2001).

Aslan and collegues (2003) reported that 57.1% of 91 nurses for critically ill patients attempted to assess the patient and establish the nature of pain experienced before administering the analgesics. Also in study by Kituyi and collegues (2011), 96% of the clinicians confirmed that they routinely managed post-operative pain. However, the authors did not specify what percentage of the clinicians assessed for pain or whether management meant assessment and intervention done after assessment. In addition, the finding is not reported in such a way that one can know how many of the nurses, doctors or clinical officers managed pain routinely. Although it has been noted that differences in pain measurement, settings and reporting style of findings make it difficult to compare findings across studies, there is continued documentation of underestimation of patients 'pain by nurses which ultimately impacts on management decisions. Discordance between nurses' and patients' report of pain has been documented for some time (Puntillo, Neighbour,O'Neil , &Nixon , 2003).

Watt-Watson and colleagues (2001) noted that almost one third of all nurses disagreed with their patients' rating of pain more than 25% of the time, and 40% of the nurses believed that their patients overestimated their pain more than 25% of the time. This may be attitudinal and / or knowledge related issue. It also may imply that such nurses will not manage patients' pain effectively as they are likely to administer inadequate analgesics in terms of dosage or frequency of administration. In the same study, patients who reported moderate to severe pain received only 47% of their prescribed analgesics (Watt-Watson et al., 2001). With these

kinds of findings from previous studies, more research is needed to find out whether nurses who care for critically ill patients appreciate the value of accurate measuring of patients' pain through consideration of patients' input.

Among the key components of the Hierarchy of Importance of Pain Measures recommended is the need to consider underlying pathology or conditions and procedures that might be painful (Pasero, 2002). The caring nurse has to assess and manage for pain related to procedures. However, the researcher has noted presence of limited literature on the practices related to assessment and management of pain before, during and after known painful procedures commonly done among critically ill patients.

2.5.1 Practices related to use of pain assessment tools and documentation

As earlier stated, among the key principles of pain management is use of standardized tools to assess pain and evaluate the effectiveness of interventions targeted to individual patient's needs as regards pain relief. However, literature continues to highlight the inadequate or no use of tools. Without these tools, nursing staff can only rely on their clinical judgment, which may be influenced by many of the preconceptions and attitudes about patients in pain. This in turn affects patients' outcomes on pain relief because all the prescriptions are based on nurses' ratings of pain.

Kaasalainen and colleagues (2007) found that half of all nursing staff used informal screening approaches rather than the Numerical Rating Scale (NRS) to assess patients' pain. Similar findings have been reported even in the presence of protocols (Shugarmann et al, 2010).

A study in Kenya among clinicians reported that more than 57% of the participants indicated that they had inadequate knowledge regarding tools that may be employed for pain assessment and measurement and only 12% of the health care providers had ever used any tools (Kituyi et al., 2011). The authors did not indicate what percentage was contributed by nurses.

Tools that were commonly used by the participants included Visual Analogue Scale (VAS), NRS, verbal description, Categorical Scale and McGrill Scale (Kituyi et al, 2011). The

inadequacy of knowledge about pain evaluation tools was attributed to lack of formal teaching about pain assessment and management for some participants.

Lack of formal training either pre or in-service has been continuously reported by different studies (Watt-Watson et al., 2001; Rampanjoto, Mukarugwiza, Ndimubanzi, & Finucane, 2007; Lui, So, & Fong, 2008). This does not only affect the knowledge about tools but also their use.

Rampanjoto and colleagues (2007) reported that more than 80% of nurses in emergency departments in Central Africa were unable to carry out a formal assessment of pain using VAS. They recommended a need to dedicate more time to educating nurses about all aspects of acute pain assessment and management. Limited sample size was identified as a limitation of the study.

Another study Hong Kong among 143 nurses working on medical units reported that majority (89%) of participants had either never or only seldom used objective tools for pain assessment and only 19% of them had ever attended courses related to pain assessment and management (Lui, et al., 2008). In the contrary, findings of a study conducted in Canada among critical care nurse reported better use of assessment tools. Of the 140 participants, 98.6% and 45.7% used one or more pain assessment tools for patients able and un-able to self-report pain respectively (Rose et al., 2011).

This difference in the use of pain assessment tools could be explained by the differences in the support that nurses receive through continuing professional education on pain and its management. The findings of the study in Canada showed that majority of the nurses (84.3%) reported attending some form of ongoing professional development education on topics related to pain (Rose, et al., 2011). Other approaches that were used for pain assessment among nurses who did not use a formal tool for patients unable to self-report pain included vital signs and various pain behaviors (Rose, et al, 2011). Behaviors that were most frequently considered routinely indicative of pain by nurses were grimacing, vocalization and wincing

(Rose, et al., 2011). Behavioral signs can be used in conjunction with other methods of assessing pain and should not be substituted for a self – report as long as the patient can communicate in any way (Odhner et al., 2003).

Documentation of pain assessment and management as well as the effectiveness of the interventions such as opiods or patients' response to treatment for pain is among the principles for pain management (Kwekkeboom& Herr, 2001). Findings from studies indicate minimal or no documentation practices among nurses caring for critically ill patients (Haonga et al., 2011; Watt-Watson et al., 2001). The continued lack of pain assessment documentation also highlights the ongoing gap between research and practice given that there has been strong evidence that documentation of pain assessment improves pain management and most importantly, decreases patients' pain (Shannon & Bucknall, 2003).

2.6 Enablers and barriers to adequate pain assessment for critically ill patients

2.6.1. Enabling factors for pain assessment and management

Some factors have been considered as enablers for nurses caring for critically ill patients to practice adequate pain assessment and management. These include; prioritization of pain assessment and management by ICU team , working with an ICU team that is motivated to provide effective pain relief , prescription of analgesia with adequate dosing (Rose et al ,2011) and support from nurse and medical colleagues (Watt-Watson et al ,2001). However, most times prescribers do not base the dosing on the nurses' rating of pain. In a study by Rose and colleagues (2011), most nurses (71.4%) reported that analgesic prescribing by physicians targeted to a pain score occurred less than 50% of the time. This may be a demotivator.

2.6.2 Barriers to adequate pain assessment and management among nurses caring for critically ill patients.

A number of factors may make pain assessment & management difficult. Identified barriers include patient, clinician and organizational related factors (Shannon, & Bucknall, 2003; Pasero et al., 2009; Rose et al., 2011).

Commonly cited barriers to optimal pain assessment and management include busy units, inadequate staffing, limited time, inappropriate attitude or focus on other imperatives, inadequate knowledge of pain management principles, poor communication, lack of accountability, inadequate staff training, reluctance to prescribe opiods and to take medication, patients' attitude and health status among others (Rampanjota et al., 2006; Taylor & Stanbury, 2009).

The shortage of nurses and heavy workloads associated with caring for critically ill patients may limit the time given to the interaction between patients and nurses for adequate pain assessment and control (Tunabe et al, 2000). Others mentioned in the emergency situation include inability to administer medication until a diagnosis is made, patients reluctance to report pain and use of alcohol or other recreational drugs by patients (Tunabe et al, 2000). Patient related factors like hemodynamic instability and inability to communicate have been reported to specifically impact on practices related pain assessment and management (Rose et al., 2011).

Social attitudes and cultural beliefs (of both the person in pain and practitioners) prevail and can limit effective assessment and management of pain (Ashley, 2009). Nurses have reported in some studies that taking pain medication is a sign of weakness and that pain is a logical consequence of injury (Rampanjoto et al., 2007; Thomas, 2008; Thiadens, Vervat, Albertyn, Dijk, & As, 2011).

Also absence of protocols and guidelines on pain assessment and mananagement has been cited to hinder effective pain management (Kituyi et al, 2011).

High workload and subsequent time constraints have been identified as significant barriers to assessment of pain in the critical care area. The critical care nurses frequently neglect pain assessment whilst attending more urgent patient needs (Shannon & Bucknall, 2003). It has been urged that nurses need to view pain with the same degree of urgency and importance as other changes in vital signs in order to improve patient outcomes (Shannon & Bucknall,

2003). Others include the increasing presence of technology and the rapidly changing situations common in the critical care that place time constraints on nurse's ability to make pain assessment decision and implement them(Shannon& Bucknall,2003).

Some nurse variables have been associated with pain assessment and management practices. These include years of experience, attendance of ongoing professional education on pain and it assessment and management, nurse's confidence with use of tools or performing pain assessment and perception of the importance of pain assessment and management (Kaasalainen et al., 2007; Rose et al, 2011). Poorer concordance between patients' and nurses ratings of pain has been associated with lower confidence in the ability to accurately assess pain and time constraints faced in completing nursing tasks (Kaasalainen et al., 2007). More years of experiences nurses has been associated with more confident in the ability to assess pain, but less use of pain assessement tools (Rose, et al, 2011).

Similarly, the patient's status or category may affect the perceived importance of pain assessment.

Nurses considered pain assessment equally important for surgical and trauma as compared to medical patients but more important for critically ill patients with burns injuries but less important for patients with Glasgow Coma Scale less than 8 (Rose et al, 2011). The inability of many patients to communicate adequately with the health professionals providing their care strikes at one of the most basic tenets of pain control, namely the need for patient input in pain control decisions given the subjective nature of pain (Erstad , Puntillo , Gilbert , Grap , Medina , & Mularski et al., 2009).

Level of education qualification and continuing professional education

Findings of a study showed that level of education qualification and the number of topics covered during ongoing professional education did not influence reported perceptions on the importance of pain assessment (Rose et al, 2011). Similar findings were reported by a study in Hong Kong were education level was not significantly associated with knowledge and attitude in relation to pain management (Lui et al, 2008). Shurgarman and collegues (2010) also reported that education level was not found to be associated with nursing staff pain

assesssement frequency using the NRS. On the contrary, a study among emergency nurses found that post qualification education about pain was associated with increased nurses' ability to identify more assessment cues and provision of more narcotics than nurses without such education (Tanabe et al, 2000). In the same study no association was demonstrated between knowledge scores and age, years in nursing and years in emergency nursing (Tanabe et al, 2000). There have been inconsistent reports in the literature about knowledge and practices in association to level education, post qualification education, age and years of experience. This could be explained by differences in the application of knowledge attained. If knowledge is not used it is likely to be lost. For example the findings of the study in HongKong showed that participants who had more working years of experience and were able to apply their knowledge of pain management to daily practice were more likely to have a higher knowledge percentage of correct scores on knowledge questions and had better attitudes (Lui et al., 2008).

Strategies for changing practice:

Strategies that have been proven to successfully address the barriers include the following; improvement of documentation practices, the development of guidelines and algorithms to augment clinical decision making, and increasing education of critical care nurses in the area of pain management (Shannon & Bucknall, 2003 ; Maysoon, 2009). Continuous evaluation of practices and nurses' level of knowledge in relation to research- based pain assessment and management strategies also assists in the planning of further education programmes in order to improve nursing practice (Shannon & Bucknall, 2003)

CHAPTER THREE:

3.0 STUDY METHODOLOGY

3.1 Study design

The study employed a descriptive cross-sectional study design. A quantitative method was chosen because it enabled the researcher to collect numerical data and perform quantitative analysis using statistical procedures, in order to determine the level of knowledge and describe practices related to pain assessment for critically ill patients among nurses at Mulago Hospital. A cross-sectional design was the most appropriate design. This is because it enabled the researcher to systematically determine and report the level of knowledge and practices just the way they are among a cross section of the nurses at one point in time.

3.2 Study setting

The study was carried out at Mulago Hospital. Mulago Hospital is Uganda's national hospital. Mulago Hospital is situated on Mulago hill, Kawempe Division, in the northern part of Kampala District, the capital city. The hospital has a capacity of 1,500 beds and is Uganda's premier teaching and research hospital. Mulago National Hospital is the largest hospital in the country and is staffed by 2,057 health care professionals with nurses making up the largest percentage [42%] (Africa Health Workforce Observatory, 2009). Mulago Hospital receives referred critically ill patients from all parts of the country while others become critically ill within the hospital. It has designated units for general critically ill patients (medical, surgical), but also special units; for patients with burns, emergencies, intensive care and neurological units for adults. On average each of these units has 20 patients per month and 12 nurses. Nurses are qualified with diplomas, a bachelor's degree and a master's degree in nursing. Mulago Hospital has been chosen because it is the largest public hospital and the only one with some services like those for cardiac problems, Burns unit and neurological units. Also, being a national hospital it is assumed that it has the largest number of nurses that care for critically ill patients with diverse conditions such as medical, surgical, traumatic, and neurological and burns. The nurses have contact with a variety of critically ill patients.

3.3 Study population

The population is nurses working at Mulago Hospital. Mulago Hospital has about 864 nurses (African Health Workforce Observatory, 2009). Nurses who care for critically ill patients at Mulago Hospital comprised the target population. Nurses caring for critically ill adult patients during the study period and meeting the eligibility criteria comprised the study population**.** These included nurses working on the intensive care unit, Burns' unit, post-operative unit or wards, emergency and neurological units. According to the records at the office of the head nurse at Mulago Hospital (January 2012), 200 nurses were allocated to care for patients at selected units.

3.4 Sample size estimation

A single proportion sample size estimate was determined using the Kish Leslie [1965] formula: $N = Z_{\alpha/2}{}^2 * P(1-P)/d^2$

Where: N = sample size

p= 41%, estimated proportion of nurses who had sufficient knowledge to recognize and manage post-operative pain (Kituyi et al, 2011)

d =5% (maximum margin of error the researcher is willing to allow)

Z =1.96 (standard normal deviation value corresponding to 95% confidence level)

N = 371 participants. Adding 10 % (37) for non response rate, (371+37) = 408.

Therefore the required sample was 408 nurses. However, given that only 200 nurses were allocated at the selected units, the researcher aimed at recruiting as many nurses as possible from those available as advised by a senior biostatistician at Muhimbili University. During the study period, 15% of the 200 nurses available on the selected units did not return the questionnaires. This lead to a sample of 170 nurses.

3.5. Eligibility criteria

Inclusion criteria

i) Nurses registered by the Uganda Nurses and Midwives council.

ii) Nurses who were officially employed by Mulago Hospital

iii) Those who consented to participate in the study.

iv) Nurses who had worked at the above specified units for at least 1 month.

Exclusion criteria

i) Nurses who were not directly involved in the bedside patient care such as nurse managers.

3.6 Sampling procedure

A purposive sampling method was used at the level of selecting the hospital and units from which participants were recruited. The units were purposively selected to ensure that nurses who had experience with care for critically ill patients who commonly suffer acute pain participated in the study. All nurses at the selected units were eligible to participate in the study. The researcher approached each of the nurses available during the time of the study at the selected units and explained the purpose of the study and requested for their participation. Then the nurse who wished to participate would read and sign a consent form.

3.7.0 Study variables/ measurements

3.7.1 Independent variables

Demographic characteristics; age, rank, gender and level of education qualification, years of working experience, years of unit experience, pain in-service education.

3.7.2 Dependent Variables

- practices related to pain assessment
- Level of knowledge related to pain assessment
- Perceived barriers to pain assessment and management

3.8.0 Description of study tool

Quantitative data was collected using a semi- structured questionnaire (see Appendix I). It was an instrument developed, piloted in five ICUs and re-evaluated by ten experts in pain, critical care and research methodology in Canada (Rose et al, 2011). An iterative process was

used to assess the face and content validity of the tool after reviewing existing studies on pain assessment tools, behaviors and procedures considered potentially painful. The reliability of the tool had not been reported but the experts rated the instrument's clarity, content validity and comprehensiveness based on the method described by Burns and colleagues (2008). The tool had been used in Canada and found to be reliable (Rose et al, 2011). The researcher got permission to make modifications in the questionnaire to be relevant to the setting (see Appendix II). Specifically, the researcher modified the tool by changing the responses to some of the closed questions on practice and knowledge from the likert style (for example not at all, minimally, somewhat, moderately and extremely) to Yes or No format. Rearrangement of questions and dividing some into two parts was also done. The division of some questions was done in such a way that the participant needed to select either no or yes to continue or not with the second part .Questions about patients who unable to self-report pain were removed as the researcher selected to first concentrate on pain assessment for patients who can report pain. A few open and closed questions were added. Since the tool was used in a setting different from African type and with the modifications made, the researcher established the reliability and validity of the questionnaire. Internal consistency reliability was assessed by obtaining coefficient alpha (Cronbach's alpha). It was used as the index to estimate the extent to which different subparts of the instrument were reliably measuring knowledge about pain assessment principles for critically ill patients. Internal consistency reliability was chosen because the measure of knowledge levels involved summing item scores (Polit & Beck, 2008). In general values, below .60 are considered poor, .60 to .69 are minimally acceptable, .70 to .79 are moderate or acceptable, .80 to .89 are considered good, above .90 are excellent. The reliability test in the study revealed the scale to be acceptable with an overall Cronbach's alpha of the 0.71. The value reflects acceptable internal consistency, and data collected using the instrument is considered to be reliable data. Content validity was used. Content validity is the extent to which an instrument has an appropriate sample of items for the construct being measured and adequately covers the construct domain (Polit & Beck, 2008). The researcher gave the tool to 3 experts in critical care and requested them to evaluate whether individual items were relevant and appropriate. They were asked to rate the items on a 4-point scale of

relevance in relation to knowledge and practices of pain assessment principles. Where 1= not relevant, 2= somewhat relevant, 3= quite relevant &4= highly relevant. Then, for each item, the item content validity index (I-CVI) was computed as the proportion of experts in agreement about relevance by giving rating of 3 or 4. Then, the scale –level content validity (S-CVI) was computed by averaging the I-CVIs. A value of .90 was recommended as the standard for establishing excellent content validity (Polit & Beck, 2008). Discussions with some of the evaluators were done to understand the reason for the ratings and how to improve.

The Questionnaire consisted of yes/ no and a few open- ended questions. The questions were arranged in four major sections namely; sections on knowledge, practices, barriers, and demographic characteristics. The questions on knowledge were intended to yield responses that answered study question two. Some of the concepts in these questions included knowledge on who accurately assesses patients' pain; need to assess pain among others. The questions on practices were intended to collect responses that answered study question one. The concepts covered included whether nurses assess for pain, use of pain assessment tools, and documentation of pain scores among others. Questions aimed at answering study question three covered barriers to adequate pain assessment related to the patient, organization and provider.

3.9.0 Ethical Consideration

Ethical clearance was sought and granted from the Research Ethical committee at MUHAS and Mulago Hospital Research and Ethics Committee (See appendix III). Written informed consent was obtained from prospective participants before their participation. The consent form written in simple English clearly stating the purpose, risks, benefits and rights of participants like the right to withdraw any time, in the whole study was used (See Appendix IV). The participants were assured that their participation was totally voluntary and that if they chose not to participate in the study, it would not affect them, in any way. The nature of commitment in terms of time and form of participation like filling a questionnaire was clearly indicated. Information obtained was treated with utmost confidentiality. No identifiers like name of the participant were indicated on the questionnaire. Only identification numbers and

date for data collection were recorded. Anonymity was further kept by reporting the research findings as group data. Filled questionnaires were kept under lock and key and only accessible to the researcher. Access to data entered on a computer file was through a password known to the researcher only.

3.10 Data collection

After obtaining ethical clearance, the researcher introduced herself to the area managers, nurse in-charges for selected units. The researcher held brief meetings with unit managers to explain the purpose and procedures of the study and obtain permission to conduct the study from them. Brief introduction to the prospective participants was done at individual level and consent forms provided by the researcher to the eligible participants during day, evening and night shifts. The researcher let the nurses have enough time to read the consent form and ask questions about the study. Signed consent forms were got from the nurses willing to participate and then a copy of the questionnaire would be given to each. Each participant would be given time to fill the questionnaire and return it when filled. Filled questionnaires were checked for completeness and legibility by the researcher immediately and clarification sought when necessary. Data was collected over a period of one month.

3.11. Data management

Each completed questionnaire was checked for errors, completeness and legibility immediately and missing or unclear data retrieved from the participant. Filled questionnaires were stored safely in a cupboard under lock and key. Pre-coded data were directly entered onto a computer file to create a data set. For questions with possibility of more than one response, each response was coded as though the item was a separate question. Codes were assigned to the responses. Data from open-ended questions and other unstructured formats were coded after reviewing a sizable portion of data to understand the content. Data entry was done using EpiData version 3.1 program. Entries were verified and mistakes of data entry corrected through comparing visually the numbers on a printout of a data file with codes on the original source. Data cleaning was done by performing checks for outliers and wild codes (impossible codes). Then decisions were made on whether outliers were legitimate values or

errors. For impossible codes, correct codes were tracked using identification numbers of the original source. Consistency checks were also done for entered data.

3.12 Data analysis

Descriptive statistics such as mean, median and standard deviations (SD) were done for continuous variables. Frequency distribution and percentages were done for categorical variables. Data analysis was performed with SPSS version 14.0. Frequencies and proportions were used on responses about knowledge related to pain assessment principles. Section II of the Questionnaire consisted questions examining nurses' self-reported knowledge of the principles of pain assessment (Appendix I). Each correct answer was assigned a score of 1 and an incorrect answer assigned a zero score on each item. Then a total of the scores for correct responses was obtained for each individual and a percentage calculated. Using SPSS, means and standard deviations for the categories based on level of education, experience at the unit and in Nursing were established. Inferential statistics employed analysis of variance (ANOVA) to test the relationship between knowledge of principles and nurses' level of qualification, experiences in Nursing and at the work station or unit. ANOVA was chosen as it allows for testing mean score differences more than two groups. For objective three, frequencies and percentages were used to analyze data on barriers. For the open-ended questions, the researcher first read the responses in at least ten questionnaires and came up with key codes and themes to use during analysis. Then, the themes were used to come up with frequencies and percentages.

3.13 Quality control

Data was collected by a single researcher. Same data was entered twice by two different individuals to ensure appropriate data consistency and quality. The researcher pre-tested the instruments for evaluation and refining among 10 nurses caring for critically ill patients at Muhimbili National Hospital in Dar es Salaam, Tanzania. This provided insight on how much time was needed to administer the instruments, clarity, validity of the instruments and sequencing and adjustments were done depending on the results. Coding, entering, verifying and cleaning of the data were performed with great care.

3.14. Data presentation and plan of dissemination.

Results are presented in the report using descriptive statistics, text, frequency tables and figures.

A research report will be presented to the School of Nursing and School of Postgraduate Studies at MUHAS as partial fulfillment of the requirements for the award of Master's degree in Nursing. The results of the study will be communicated to Mulago Hospital, Makerere University College of Health Sciences (MakCHS) and to the Ministry of Health, Uganda. The researcher will hold a dissemination meeting with nurses at Mulago Hospital. Efforts will be made to publish the results in a peer reviewed scientific journal and make presentations at seminars, workshops and scientific conferences. Hard and soft copies will be availed to MUHAS library and Albert Cook library at MakCHS.

CHAPTER FOUR

4.0 RESULTS

This chapter presents the results on nurses' practices, knowledge, and perceived barriers related to pain assessment for critically ill patients at Mulago National Referral Hospital. Data was collected from 170 nurses, which gives a response rate of 85%. The chapter is divided into sub-sections on demographic characteristics, practices, knowledge and perceived barriers.

4.10 Description of the sample

As shown in Table 1 below, majority of the participants (83.5%) were over 30 years with the age group 31-40 years constituting the largest group (39.4%) and mean age of 39.7years. Majority of the participants; were females (95.9%), more than a quarter of the participants (46.5%) had less than 2 years of unit experience and majority (56.5%) had more than 10 years of nursing experience. Majority (88.2%) of the participants had attained diploma level of education in Nursing.

Table 1: Distribution of participants by demographic characteristics

Variable	Frequency(N=170)	Percentage (%)
Age in years (M= 39.7, SD= 8.2)		
20 – 30	28	16.5
31 – 40	67	39.4
41 – 50	61	35.9
51+	14	8.2
Gender		
Male	07	4.1
Female	163	95.9
Rank		
Enrolled	08	4.7
Registered	162	95.3
Highest qualification attained		
Certificate	13	7.7
Diploma	150	88.2
BSN	07	4.1
Experience in nursing (years)		
< 2	06	3.5
2 – 5	24	14.1
>5 – 10	44	25.9
>10	96	56.5
Unit experience (years)		
< 2	79	46.5
2 – 5	38	22.4
>5 – 10	20	11.7
>10	33	19.4

As shown in Figure 2 below, majority of the participants (54.7%) were from the post operative units while 23.5% were from the Emergency Department.

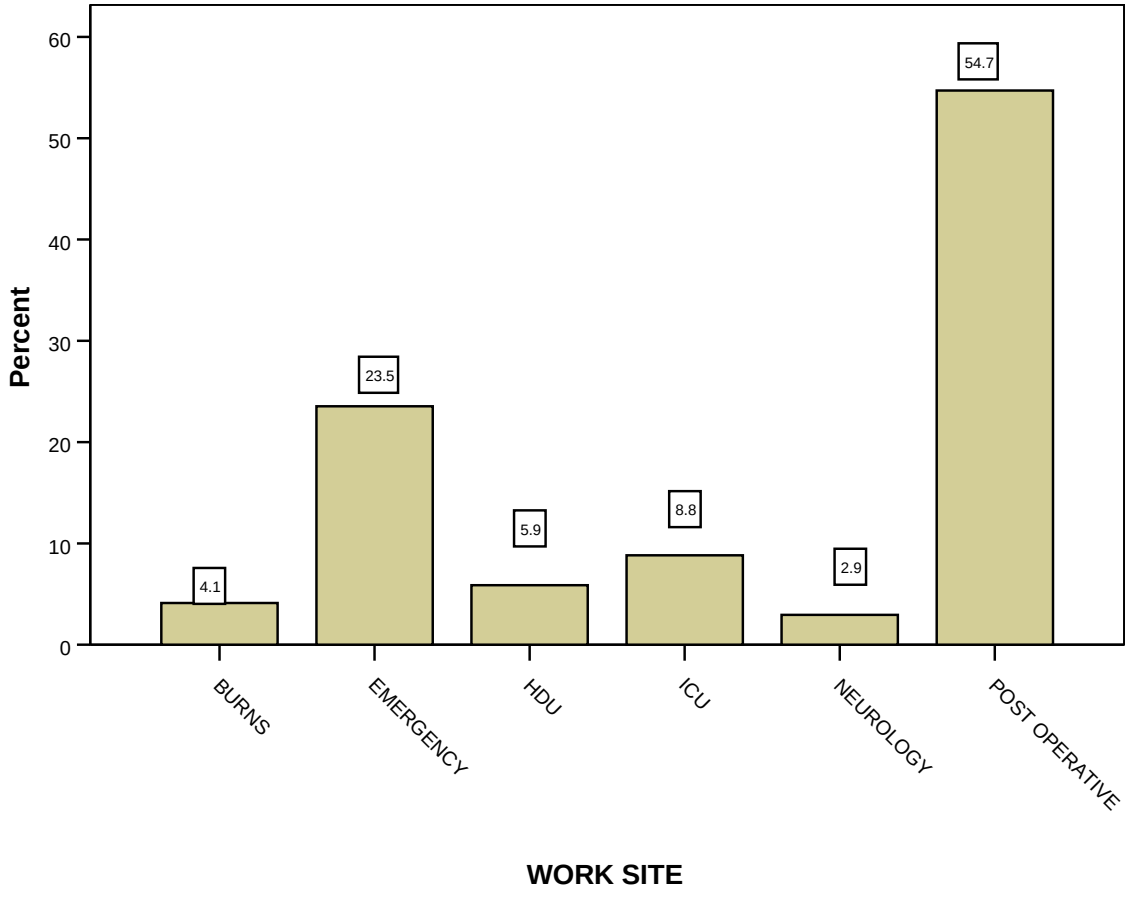


Figure 2: Percentage distribution of participants by worksite or unit

4.2 Practices related to pain assessment

Of the 170 participants, 153 (90%) reported that they assess for pain among adult patients who are able to report pain while 17(10%) did not. Responses to an open-ended question revealed that among those who reported that they did not assess for pain, the commonest reason for not assessing was because patients are able to report pain 9(53%); so there is no need to assess for it. Other reasons included: lack of guidelines for pain assessment4 (24%), lack of pain assessment tools 3(18%) and heavy nursing workload 1(5%). As shown in Figure 2 below , majority 147(96%) of the participants who assessed for pain did not use any pain assessment tools . Among those who reported to use a tool , majority 5(83.3%) used it sometimes , which is 26 to 50% of the time. The tools used included ; numerical rating scale , FACES and Visual analogue.

N = 153

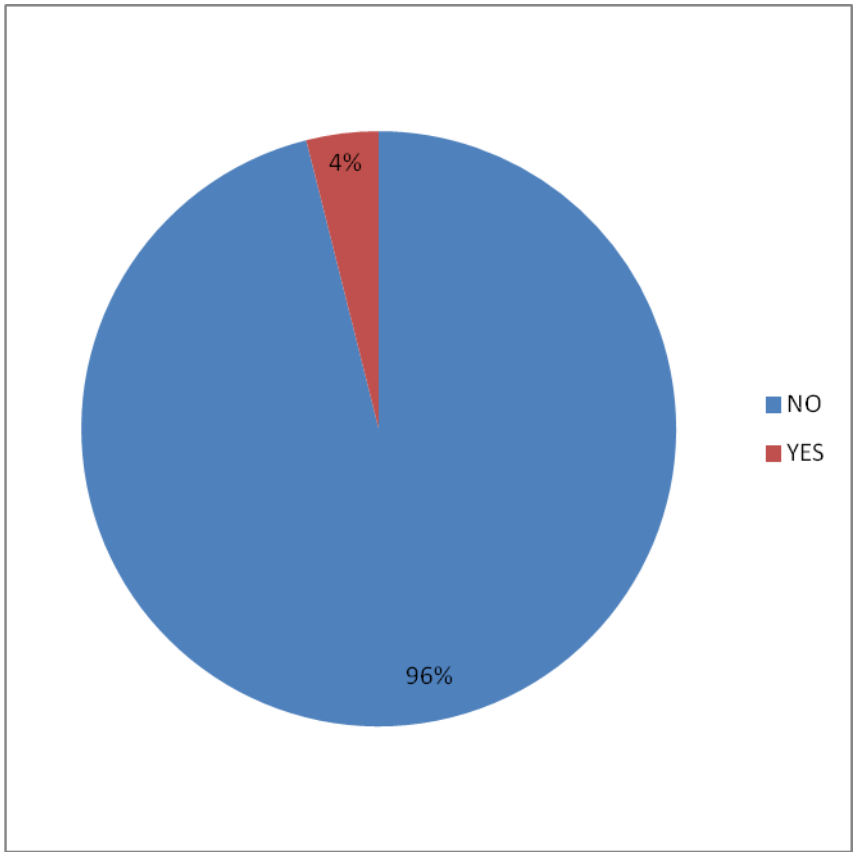


Figure 3: Percentage distribution of participants by whether they use tools during pain assessment or not.

Findings in Table 2 below were summarized from the responses to an open-ended question. The Findings show that the mostly used methods of pain assessed among participants who did not use tools included; patient's verbal report or complaints (68%), facial expression like tearing and frowning (34.5%), and touching to elicit tenderness (27.2%).

Table 2: Distribution of participants by method used to assess pain (Multiple responses to an open-ended question)

Method used to assess	Frequency (N =147)	Percentage (%)
By touching to elicit response showing pain	40	27.2
Facial expression	51	34.5
Observe patient's behavior	32	21.8
Patient's verbal report of pain	100	68.0
Prediction of pain by type of surgery or illness	08	5.4
Time interval between analgesic administration	01	.68

Findings in Table 3 below, show that majority (79.1%) of the participants who assessed for pain documented findings after assessment. Almost three quarters 89 (74%) of those who reported to document pain assessment findings did it whenever a patient reported pain or complained. Others documented hourly 5 (4.1%), two hourly 6(5%), more than 2 hourly 3(2%) and once every shift 18(14.9%). As shown in Table 3 below, majority of the participants who assessed for pain did not assess for the need of analgesics before the following procedures are performed; repositioning (60%), endo-tracheal suctioning (73%), drain removal (51%), and invasive line placement (67%). And more than a quarter (29%) did not assess for the need for analgesics before wound care.

Table 3: Distribution of participants who assessed for pain by their assessment practices

Variable	Frequency (N =153)	Percentage (%)
Document findings on assessment		
Yes	121	79.1
No	32	20.9
Assess the need for analgesia before		
Patient repositioning		
Yes	61	39.1
No	92	60.9
Endo-tracheal suctioning		
Yes	42	27.5
No	111	72.5
Wound Care		
Yes	108	70.6
No	45	29.4
Drain removal		
Yes	75	49.0
No	78	51.0
Invasive line placement		
Yes	51	33.3
No	102	66.7

4.2.3 Reasons for not documenting of findings on assessment.

Analysis of the responses to an open-ended question revealed some reasons for not documenting findings. Among the 32 participants who did not document findings, the following were mentioned as reasons for not documenting; lack of guidelines for pain assessment and management 3(9.4%), no need to document because patients can report pain 1(3.1%), lack of pain charts for documentation 19 (59.4%), pain assessment is not part of routinely documented data 15 (46.9%) and nursing workload 7(21.9%).

Table 4 below shows that almost all (95.9%) participants reported that pain assessment findings are not discussed during nurse – to – nurse reports. Almost a half of the participants (43.5%) and (41.8%) reported that they do not agree with patients' statements about their pain and do not feel competent in effectively assessing patient for having pain respectively.

Table 4 : Distribution of participants by other practices related to pain assessment

Variable	Frequency(N = 170)	Percentage (%)
Pain assessment findings discussed during nurse-to – nurse report		
Yes	07	4.1
No	163	95.9
Pain management discussed during nurse- to – nurse report		
Yes	130	76.5
No	40	23.5
Pain management discussed during unit rounds		
Yes	94	55.3
No	76	44.7
Always agree with patient's statement about their pain		
Yes	96	56.5
No	74	43.5
Feel competent in effectively assessing patient for having pain		
Yes	99	58.2
No	71	41.8

4.30 Knowledge related to pain assessment

As shown in Table 5 below, almost half of the participants (43.5%) mentioned people other than the patient as the most accurate in rating the pain intensity for the patient.

Majority of the participants knew that is important to assess for pain among; post operative patient (98.8%), medical (92.4%), patients with Glasgow Coma Scale < 8 (75.9%), trauma patients (94.7%), and Burns (95.3%). More than a quarter of the participants (35.5%) did not know that assessing for pain among sedated patients is important.

Table 5: Distribution of participants by their knowledge on pain assessment concepts

Variable	Frequency (N= 170)	Percentage (%)
Most accurate rating of pain intensity provided by		
Physicians	09	5.2
Nurses	61	35.9
Patients	96	56.5
Relatives	04	2.4
Important to assess pain for these patients		
Postoperative		
Yes	168	98.8
No	02	1.2
Medical patients		
Yes		
No	157	92.4
With Glasgow Coma Scale less than 8	13	7.6
Yes		
No		
Trauma	129	75.9
Yes	41	24.1
No		
Burns patients	161	94.7
Yes	09	5.3
No		
Patients receiving sedatives	162	95.3
Yes	08	4.7
No		
	113	66.5
	57	35.5

Table 6 below shows that majority of the participants knew that pain assessment tool (90%), assessment and documentation (92.9%) of pain are important. More than a quarter of the participants did not know that assessment for the need of analgesics before the following procedures is important; repositioning (37.6%) , endo-tracheal suctioning (45.3%) , drain removal (34.7%), invasive line placement (46.5%)and spontaneous breathing trials (63.5%)

Table 6 : Distribution of participants by their knowledge on other pain assessment concepts

Variable	Frequency (N= 170)	Percentage (%)
Pain assessment tool important		
Yes	153	90
No	17	10
Assessment and Documentation important		
Yes	158	92.9
No	12	7.1
Important to assess for the need of pre-emptive analgesia for the procedure		
Patient repositioning	106	62.4
Yes	64	37.6
No		
Endo-tracheal suctioning	93	54.7
Yes	77	45.3
No		
Wound care	142	83.5
Yes	28	16.5
No		
Drain removal	111	65.3
Yes	59	34.7
No		
Invasive line placement	91	53.5
Yes	79	46.5
No		
Spontaneous breathing trials	62	36.5
Yes	108	63.5
No		

4.3.1 Knowledge scores of nurses related to pain assessment principles.

As shown in Figure 4 below, majority of nurses scored 92.9%. The overall mean score was 71.8% (SD, 18.8). The median score was 71.43%. However, almost three quarters 125 (73.5%) felt that their knowledge is not adequate and only 45 (26.5%) felt that it is adequate**.**

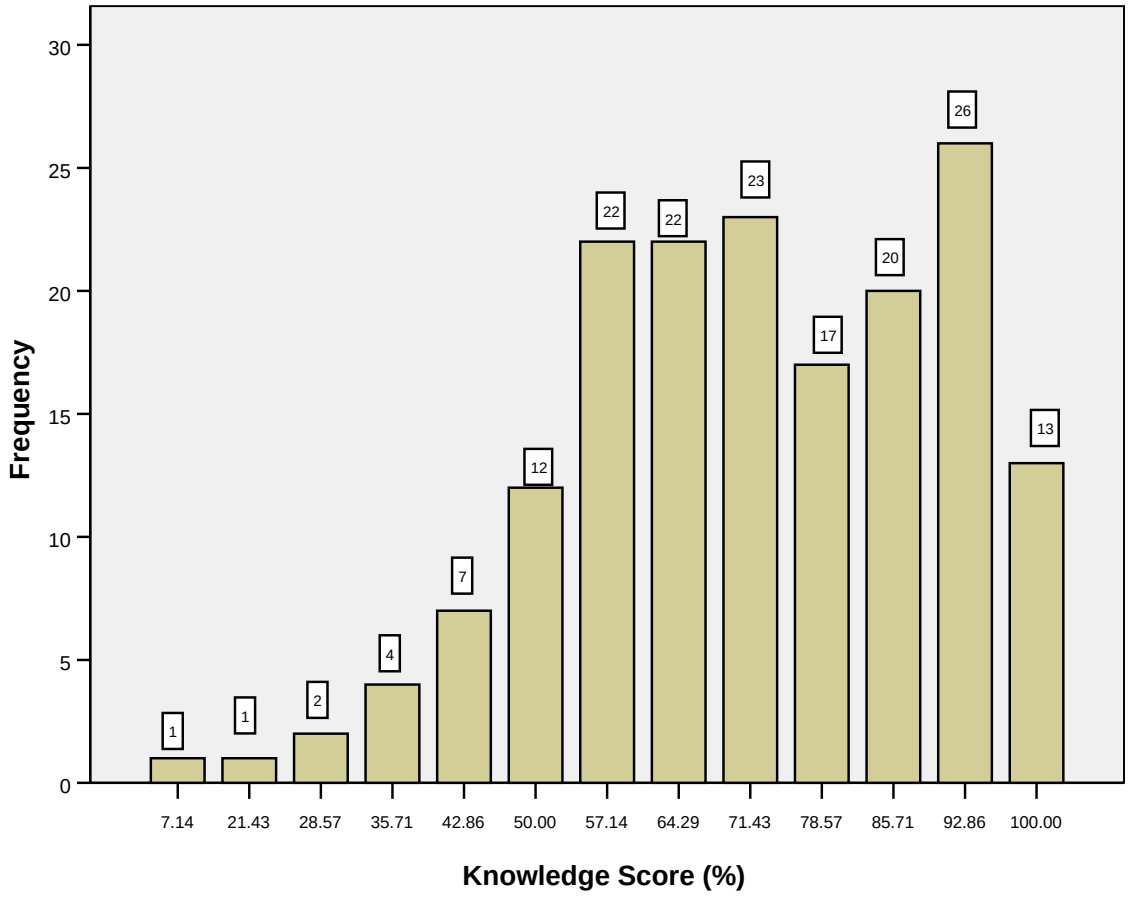


Figure 4: Distribution of nurses by overall scores on knowledge questions

As shown in Table 7 below, nurses who had less than 2 years of nursing experience had the highest mean score while those with more than 10 years of unit experience had the highest mean score. Inferential statistics utilizing an analysis of variance (ANOVA) found no statistically significant evidence for a real difference between mean knowledge scores with respect to unit experience [F= 0.782 , (3,166) ,p= 0.505] and nursing experience [F= 0.588,

(3,166) , p=0.505). Participants with Bachelor of Science in Nursing had the highest mean knowledge score. No statistically significant differences were identified between qualification level and knowledge scores [F=1.736, (2,167), p =0.179). A significance level of $P<0.05$ was accepted as statistically significant.

Table 7: Mean Knowledge scores of nurses by socio- demographic characteristics

Variable	Number of nurses (N=170)	Mean score (%)	Standard Deviation
Years in Nursing			
< 2 years	06	77.38	11.44
2 – 5 years	24	68.16	21.78
> 5 – 10 years	44	70.94	17.79
>10 years	96	72.77	18.89
Years at the Unit			
< 2 years	79	71.62	16.41
2 – 5	38	69.74	21.03
>5 – 10	20	69.64	17.78
>10 years	33	75.97	22.00
Level of qualification			
Certificate	13	76.37	21.31
Diploma	150	70.90	18.73
Bachelor's Degree	07	82.65	11.58

4.4 Perceived barriers to pain assessment

As shown in Table 8 below , majority of the participants reported the following as barriers to pain assessment ; nursing workload (84.1%), lack of availability of assessment tools (74.1%), lack of education on assessment tools (82.4%) , lack of familiarity with tools (78.2%) , lack of protocols and guidelines on pain assessment and management (74.1%), poor documentation of pain assessment and management (77.6%) and poor communication of pain assessment priorities at the unit (74.7%

Table 8 : Distribution of participants by perceived barriers to pain assessment and management.

Variable	Frequency (N =170)	Percentage (%)
Nursing Workload		
Yes	143	84.1
No	27	15.9
Lack of availability of pain assessment tools		
Yes	126	74.1
No	44	25.9
Lack of education on assessment tools		
Yes	140	82.4
No	30	17.6
Lack of familiarity with assessment tools		
Yes	133	78.2
No	37	21.8
Patient instability, e.g. unstable hemodynamic		
Yes	96	56.5
No	74	43.5
Patient inability to communicate		
Yes	103	60.6
No	67	39.4
Lack of protocols & guidelines for pain assessment		
Yes	126	74.1
No	44	25.9
Low priority of pain management by unit team		
Yes	105	61.8
No	65	38.2
No designated area for charting pain		
Yes	99	58.2
No	71	41.8
Sedation interfering with pain assessment		
Yes	112	65.9
No	58	34.1
Poor documentation of pain assessment and mgt		
Yes	132	77.6
No	38	22.4
Poor communication of pain assessment priorities at the unit		
Yes	127	74.7
No	43	25.3
Insufficient analgesia dosage prescribed		
Yes	99	58.2
No	71	41.8

4.5 Training related to pain assessment.

More than a quarter of the participants 52(30.6%) had never had any training on pain assessment and management. Of the 118 participants who had received some training, majority 99 (83.9%) were not satisfied with the training. Only 19 (16.1%) were satisfied with the training they received.

As shown in Table 9 below, majority of the participants had never had training on; pain physiological mechanisms (74.7%), pain assessment methods and tools in critically ill patients (72.9%), practice recommendations/guidelines (78.8%) and physiological consequences of unrelieved pain (60.6%). Of the 170 participants, 155 (91.1%) had never read any guidelines of pain assessment and management.

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Table 9 : Distribution of participants by topics covered during continuing professional education.

Variable	Frequency (N =170)	Percentage (%)
Pain physiological mechanisms		
Yes	43	25.3
No	127	74.7
Pain assessment methods and tools in critically ill patient		
Yes	46	27.1
No	124	72.9
Physiological consequences of unrelieved pain	67	39.4
Yes	103	60.6
No		
Psychological consequences of unrelieved pain	78	45.9
Yes	92	54.1
No		
Painful conditions and procedures		
Yes	99	58.2
No	71	41.8
Pharmacological management principles /strategies		
Yes	73	42.9
No	97	57.1
Non- pharmacological management principles /strategies		
Yes	53	31.2
No	117	68.8
Practice recommendations/guidelines		
Yes	36	21.2
No	134	78.8

Findings in Table 10 below show that the mostly suggested ways for improvement of pain assessment and management include; in-service training on pain assessment and management

(61.8%), provision of pain charts for documentation (46.5%), provision of guidelines and protocols on pain assessment (30%), and introduction of pain assessment tools (58.2%).

Table 10: Distribution of participants by suggestions for improvement. (Multiple response)

The suggestions for improvement were elicited using open- ended question.

Variable	**Frequency(N =170)**	**Percentage (%)**
Hospital prioritization of pain assessment & management	**15**	8.8
Improve availability of analgesics	22	12.9
In-service training on pain assessment & management	105	61.8
Increase staffing	32	18.8
Introduce pain assessment tools	99	58.2
Motivate staff	33	19.4
Provide pain charts for documentation	79	46.5
Provision of guidelines/protocols for pain assessment	51	30.0

CHAPTER FIVE

5.0 Discussion of results

The chapter discusses practices, knowledge and perceived barriers among nurses caring for critically ill patients at Mulago National Referral Hospital.

5.10 Demographic characteristics

A total of 170 nurses were interviewed, with 84% older than 30 yrs. Majority were females (96%). The high percentage of female nurses in the study is due to the dominance of females in the nursing profession in Uganda. Majority of the nurses had less than two years of unit experience (47%) and had attained diploma level (88%) of education in nursing. The few years of unit experience could be explained by absence of specialized training of nurses in critical care coupled with a practice of rotating from one unit to another within the hospital. The high percentage of diploma holders is explained by the fact that the public service system has just started recruitment of nurses at bachelors' level. Majority (57%) had experience of more than ten years in nursing.

5.2 Practices Related to Pain Assessment

Majority (90%) of the nurses reported to assess pain among patients able to report pain. However almost all who assess (96%) reported not to use any pain assessment tools. Numerical rating scores, FACES and visual analogue scale were seldomly used by the 4% who reported to use tools. Similar findings have been reported in studies done by Kituyi & colleagues (2011) in Kenya, Lui (2008) Hong Kong and Maysoon (2009) in Jordan respectively. In the contrary, findings of a study conducted in Canada by Rose and colleagues (2011) reported that almost all nurses caring for critically ill patients (98 %) used a tool to assess for pain for patient able to self – report pain. These differences in the practices may be attributed to differences in ongoing professional education received, staffing, and presence of guidelines among others (Rampanjota et al., 2006; Taylor & Stanberry, 2009). For example a study done by Rose & colleagues (2011), reported that more than three quarters (84%) of the nurses who were caring for critically ill patients had received ongoing professional education

on pain assessment and management. Lower attendance of 12% and 19% were reported by Kituyi (2011) in Kenya and Lui (2008) in Hongkong respectively. In Turkey, only 14% of such nurses had received education related to pain and this was during pre-service training (Aslan et al,200). Similarly, in this study 31% of the nurses had never had any formal training on pain assessment and management, and of those who had received training, majority (84%) were not satisfied. In addition, almost three quarters (73%) of the nurses had never had any training on pain assessment tools and methods. As shown in the Conceptual framework in Figure 1, lack of formal training is a key factor that can lead to inadequate knowledge about, and lack of familiarity with pain assessment tools and methods as well as poor application among nurses. This ultimately hinders optimal pain assessment and management.

In a study by Rwampajoto and colleagues (2006), more than three quarters of nurses could not assess pain using the provided Visual Analogue Scale. This may imply that provision of tools and presence of protocol on how to use them are not enough to ensure use of the tools. There is more to that. There is increasing evidence on the impact of continuing education programmes on pain assessment practices (Bedard, Purden & Certosini, 2006; Maysoon, 2009).For example, a well planned and implemented education programme for nurses in Jordan coupled with supervision of application of knowledge showed that nurses developed a habit of assessing post-operative pain intensity using numerical rating scales and improved documentation practices (Maysoon, 2009). Therefore education with supportive follow-up is necessary. In our study, we stopped at nurses' self- report about their practices and previous education on pain assessment. It was not possible to observe the practical pain assessment and documentation as well as measure patients' out in terms of optimal pain relief. This was because of time constraint. However, a study designed to included methods like participant observation , records' review and reports from patients would provide a complete picture of pain assessment and documentation practices and how these relate to optimal pain relief in patients as summarized in the Conceptual framework. This is a limitation in this study. However, our study managed to get participation from 85% of the available nurses at the

purposively selected units at the National Hospital. Such a response rate enables us to have some degree of confidence in the findings using a self- report method.

In this study, among the nurses who did not use tools; patient's verbal report or complaints (68%), facial expression like tearing and frowning (35%), and touching to elicit tenderness (27%) were the mostly used methods of pain assessment. Others included observing patients' behavior, prediction of pain by type of surgery or illness and time interval between analgesic doses. Use of other methods to assess pain like prediction of pain by the type of surgery done or illness under rates the value of patients' self report as a gold standard for pain assessment among patients who can report their pain experience. Similar findings have been reported even in the presence of protocols (Shugarmann et al, 2010; Kaasalainen et al., 2007). Such a practice may indicate inadequate knowledge about pain assessment principles.

Findings of this study show minimal and inconsistent use of tools. Use of standardized tools promotes consistence among health care providers, enhances communication between patients and the providers and facilitates evaluation of pain management interventions (Herr et al., 2006). The lack or minimal use of tools as reported by nurses at the study site, compromises the quality of care provided to critically ill patients because such practices have been associated with high prevalence of discordance between patients' and providers' ratings of pain intensity (Shurgarmann et al., 2010). As shown in the conceptual framework, presence and use of tools are among the major organizational factors that promote quality acute pain assessment and ultimate optimal management. This implies that the lack or minimal use of tools among nurses at Mulago Hospital is likely to lead to poor patients' pain management outcomes. A study on patients' pain management outcomes with the current assessment practices is recommended.

Documentation of pain assessment findings is among the principles of pain management. More than three quarters (79%) of the nurses who assessed pain reported to document their findings. This is contrary to the findings reported by Haonga & colleagues (2009) in

Tanzania, and Watt-Watson & colleagues (2001) in Canada who reported minimal or no documentation practices among nurses caring for critically ill patients. In a study by Maysoon (2009) in Jordan less than half (46%) of the nurses documented pain. The differences in the documentation practices may be explained by the differences in the study designs. The study by Maysoon (2009) in Jordan involved auditing of patients' records which revealed no evidence of documentation of pain assessment in majority of the records. There is need to conduct audit of patients' records to establish the presence and quality of pain documentation at Mulago Hospital as this was not done in this study.

Critically ill patients have a right to pre-emptive analgesia. It's among the scientific practices or principles for pain management (Macintyre et al, 2010). In this study fewer nurses reported assessment for the need for analgesia before performance of known painful procedures; patient repositioning (40%), invasive line placement (33%) and endo-tracheal suctioning (28%). Similar findings have been reported by Rose & colleagues (2011). The findings about practice however differ from those about knowledge as higher percentages of the participants knew that it is important to assess for the need of analgesia before such procedures. This may be influenced by many factors including attitudinal, organizational and educational factors. This is indicative of poor translation of knowledge into practice.

5.3 Knowledge related to pain assessment

Almost all nurses knew how important it is to assess for pain in the various categories of critically ill patients. Similarly, almost all nurses knew that pain assessment tool (90%), assessment and documentation (93%) of pain are important. Averagely nurses scored 71.8% with median score was 71.43% on theoretical knowledge. This may be indicating that nurses are reasonably knowledgeable about pain assessment principles. However, very few nurses (26%) indicated that their current knowledge on pain assessment is adequate. The percentage is lower than that reported by Kituyi and colleagues (2011) in a similar study where 41% of the nurses indicated that they had sufficient knowledge. The reasonable knowledge among nurses may be attributed to the fact that Mulago Hospital is a national and major teaching

hospital. Several teachings happen in form of ward rounds which nurses may not consider as training.

However, findings show that almost half of the nurses do not know that the patient provides the most accurate rating of their pain intensity. This percentage is higher than that reported by Aslan and colleagues (2003) in Turkey where only 14% mentioned other people to be most accurate in rating patients' pain intensity. In addition to this finding, almost half (44%) of the nurses in this study reported that they don't always agree with patients' statement about their pain. Furthermore, more than half of the nurses who did not assess for pain reported that it is because the patient can report pain. This implies that to such nurses it is not necessary to assess for pain when a patient can verbalize pain. These findings reflect inadequacy of knowledge on key pain assessment principles which can affect practice. Individual's self report is considered as the single most reliable indicator of the existence and severity of pain given the subjective nature of pain (Pasero, 2009). Nurses are expected to know this and always apply it in practice. Findings show that more than half of the nurses (68%) use patients' verbal report as a method for pain assessment and almost three quarters (74%) of those who document findings on pain assessment do it whenever a patient reports or complains. This implies that most of the practices of nurses at Mulago Hospital are dependent on patients' report. If nurses do not always agree with patients' statements on pain, findings on assessment will be unreliable. And it is likely that patients' outcomes will be poor because management interventions rely on assessment findings as show in the Conceptual framework. For example, in a study by Watt- Watson and colleagues (2001) where almost one third of the nurses disagreed with patients and believed that patients overestimate their pain, patients who reported moderate to severe pain received only 47% of the prescribed analgesics. This resulted in poor pain relief among patients. However, this study did not include patients' outcomes.

5.4 Barriers to pain assessment:

In this study several barriers to pain assessment and management were mentioned. Nursing workload was mentioned by majority of the nurses (84%). Similar findings were reported in studies conducted by Tunabe and colleagues (2000), and Bennetts and colleagues (2012). Heavy workload limits the time given to the interaction between patients and nurses for adequate pain assessment and management. Poor communication of pain assessment priorities at the unit was mentioned as a barrier by majority of nurses. This affirms findings reported by Rampanjota and colleagues (2006), and Taylor & Stanbury (2009).

Lack of protocols and guidelines on pain assessment and management was reported to be a barrier for pain assessment by three quarters of the nurses. Such findings have been reported in other studies (Kituyi et al.,2011; Bennetts et al., 2012).Presence of protocols facilitates translation of best evidence to practice but in absence of these, clinicians have been reported to have a greater reliance on individuals' knowledge and skill (Bennetts et al., 2012). This in turn affects the quality of practice and patients' pain management outcome. Majority of the nurses reported lack of education (82%) and familiarity with assessment tools (78%) as barriers. Similar findings were reported by Kituyi and colleagues (2011) in Kenya, where clinicians including nurses had inadequate knowledge regarding tools. This was attributed to lack of formal teaching about pain assessment and management. In addition, lack of availability of assessment tools (74%) was mentioned. Under such circumstances, nurses are likely to depend on their clinical judgment instead of objective findings resulting in poor pain relief.

Poor documentation of pain assessment and management was also reported by more than three quarters (78%) of nurses as a barrier to pain assessment and management. This may be attributed to lack of a designated area for charting pain and low priority set on pain assessment. The low priority set on pain may be reflected by the findings showing that almost half of the nurses (47%) who do not document assessment findings said that it is not part of routinely documented data. In addition to this, almost all nurses (96%) reported that pain assessment findings are not discussed during nurse –to – nurse reports. This further shows how little priority is set on pain and its assessment. The issue of low priority for pain

assessment and management has been a key finding in other studies. In a study conducted by Bennetts and colleagues (2012) in Australia, majority of participants (both medical and nursing) did not consider pain assessment management to be the highest priority in the emergency department.

In summary, lack of guidelines for pain assessment, lack of pain assessment tools, lack of pain charts for documentation, low priority on pain assessment and management and nursing workload may constitute the core of the barriers to pain assessment and management. This is because these factors were even cited as reasons among those who did not assess or document findings on assessment. Suggestions for improvement of pain assessment and management included in-service training on pain assessment and management, provision of pain charts for documentation, provision of guidelines and protocols on pain assessment, and introduction of pain assessment tools. Similar suggestions were recommended by nurses in study conducted by Maysoon (2009).

5.5 Conclusions

Assessment and documentation of pain is done by majority of nurses. However, assessment tools are minimally used. In addition, majority of the nurses do not perform pre-emptive pain assessment for known painful procedures although they know it is important.

Nurses are reasonably knowledgeable about the principles of pain assessment. However, lack of knowledge on some key principles of pain assessment is worth noting. Almost half of the nurses did not know that the patients provide the most accurate rating of their pain and do not always agree with patients' statements of their pain.

Nurses' pain assessment is mostly constrained by; lack of guidelines and protocols, assessment tools, documentation charts and education on assessment tools, poor documentation of pain assessment and management and poor communication of pain assessment priorities at the unit.

5.6 Recommendations

There is need to design and implement a continuous professional education program on pain and its assessment with special focus on methods of assessment, guidelines , how to use assessment tools, protocols and charts for proper documentation for critically ill patients. In addition, introduction of tools, charts and protocols suitable in the settings is equally important. Implementation of these recommendations will require a multifaceted approach with combined input of the hospital and nurse leaders, Uganda nurses' council, practicing nurses and nurse-educators in conjunction with Ministry of Health.

To ensure proper and continued use of tools, protocols and charts, there is need for a supportive environment which can be attained through improving staffing, provision of support supervision by experienced and skilled nurses and presence of a dedicated pain management team to provide leadership on prioritizing of pain and its management, and champion the changes needed. The team needs to be multi-disciplinary including; nurses, physicians, pharmacists and officials from the Ministry of Health.

Inadequate staffing is a systemic problem that needs to be addressed by leaders at the Mulago Hospital and policy makers at Ministry of Health in Uganda.

There is need of a policy that will foster capacity building for nurses caring for critically ill patients. It should include issues of periodic staff training, translation of research findings into practice and retaining those trained on units where they can perform effectively without rotating them to inappropriate units. This can be led by the clinical nurse- leaders in the Hospital and Ministry of Health.

A study employing mixed methods involving more than one hospital is recommended to gain more insight on the knowledge and practices of nurses related to pain assessment. This will help to explain many of the findings including the discrepancy between the scores and the nurses' perception about their current knowledge. Methods of data collection like document reviews and observation need to be used. This will aid analysis of the actual practices.

5.7 Implications for Nursing practice.

The study provided an opportunity for the nurses to evaluate themselves in the area of knowledge and practices related to pain assessment. It might enhance combined effort of the health care providers and health institution's administration towards the establishment of team work to induce change with the aim of improving pain assessment practices and knowledge and ultimately, pain management. Nursing managers and supervisors can facilitate designing of strategies like lobbying the Ministry of Health and Hospital management to over barriers towards pain assessment.

5.8 Study limitations

The nature of the study design involving only self-reports of nurses, did not permit examining the actual practice in relation to pain assessment. Valuable methods of data collection like observation of actual practices and document review were not used because of limited time for the study.

Some of the nurses did not return the questionnaires which lead to the 15% non-response rate.

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APPENDIX I: Questionaire

PAIN ASSESSMENT FOR THE CRITICALLY-ILL PATIENTS
Date_____ unit code _____

Instructions : Read each question carefully and tick(√) against the option that best suits your response.
Section I (Questions related to what a nurse does for pain assessment)
The following questions relate to patients able to communicate verbally or by other means.
1. Do you assess for pain for patient able to communicate pain?
1. Yes □ 2. No □

2. If yes, do you use a pain assessment tool?
1. Yes □ 2. No □

(If no , please go to question 4)

3. If yes, how frequently do you use a pain assessment tool for patients?

□ Seldom (1-25%) □ Sometimes (26-50%)

□ Often (51-75%) □ Routinely (>75%)

Please , name the tool(s) you use_____

4. If you do **not** use a pain assessment tool, please describe your method of assessing pain for patients able to report pain:

_____
_____
_____

5. Do you document the findings after pain assessment for patients able to communicate?

1. Yes □ 2.No □

5b) If **yes**, how frequently do you assess and document pain for a patient ABLE to report pain?

□ whenever necessary (prn only) □ less then hourly
□ one hourly to 4 hourly □ more than 4 hourly to 8 hourly
□ Once every shift □ other (specify) _____

6. Do you assess the need for administration of analgesia before the following procedures are done?

a. Patient repositioning 1. □Yes 2. □No

b. Endotracheal suctioning 1. □Yes 2.□No

c. Wound care 1.□Yes 2.□No

d. Drain removal 1.□ Yes 2.□ No
e. Invasive line placement 1.□ Yes 2.□ No

f. Spontaneous breathing (weaning) trial 1.□ Yes 2.□ No

7. Are pain scores and management discussed during nurse-to-nurse report?

1. □Yes 2.□No

8. Are pain scores and management discussed during unit rounds?

1.□Yes 2.□No

9. Do you feel competent in effectively assessing patients for having pain?

1. □ Yes 2. □ no

10 Do you always agree with patients' statements about their pain?

1. Yes□ 2. No □

SECTION II (questions related to what the provider know about pain assessment and management)

In your opinion, who provides the most accurate rating of pain intensity? (please select only one response)

11. Physicians□ 2.Nurses □ 3.Patients □ 4. Relatives□

12. In your opinion, how **important** is a pain assessment **TOOL** (e.g. numerical rating score)?

1.Not at all important□ 2.Minimally important □

3. Moderately important□ 4. Extremely important□

13. In your opinion, how **important** are frequent assessment and documentation of pain in patients **able** to communicate?

1.Not important □ 2.Minimally important□

3. Moderately important□ 4. Extremely important□

14 Is it important to assess pain for the following classifications of critically ill patient?

a. Post-operative patient	1.□ Yes	2.□ No
b. Medical (nonsurgical) patients	1.□ Yes	2.□ No
c. Patients with a Glasgow ComaScale less than 8	1.□ Yes	2.□ No
d. Trauma patients	1.□ Yes	2.□ No
e. Burns patients	1.□ Yes	2.□ No
f. End-of-life patients	1.□ Yes	2.□ No
g. Patients receiving sedatives	1.□ Yes	2□ No

15. Do you think it is important to assess for pain and need for analgesia before, during, and after to the following procedures?

a. Patient repositioning 1. □Yes 2.□No

b Endotracheal suctioning 1.□Yes 2.□No

c. Wound care 1.□Yes 2.□No

d. Drain removal 1.□ Yes 2.□ No

e. Invasive line placement 1.□ Yes 2 □ No

f. Spontaneous breathing (weaning) trial 1.□ Yes 2.□ No

.

16. To your knowledge, what are the consequences of unrelieved pain?

_____

_____

_____

_____

_____

17. Do you feel your current knowledge about pain assessment is adequate?

1. Yes□ 2. No □

Section III (Question about barriers and enablers to pain assessment and management)

18. Please indicate whether or not an item affects your ability to **assess** patients for **pain** by ticking (√) yes or no.

a. Nursing workload 1.□ Yes 2. □No

b. Lack of availability of pain assessment tools 1.□ Yes 2. □No

c. Lack of education on assessment tools 1.□Yes 2. □No

d. Lack of familiarity with assessment tools 1.□Yes 2. □No

e. Patient instability e.g. unstable hemodynamics 1.□ Yes 2. □ No

f. Patient inability to communicate 1. □Yes 2.□No

g. Lack of protocols for pain assessment 1.□Yes 2.□No

h. Low priority of pain management by unit team 1.□Yes 2.□No

i. No designated area for charting pain 1.□Yes 2.□No

j. Sedation interfering with pain assessment 1.□Yes 2.□ No

k. Poor documentation of pain assessment and management 1. □Yes 2. □No

l. Poor communication of pain assessment priorities at the unit
□Yes □ No

m. Insufficient analgesia dosage prescribed
□Yes □No

n. Others (please identify) _____
_____

19. Please indicate whether or not each of the following **enables** your delivery of effective pain practices by ticking (√) yes or no.

a. Pain assessment and management is a unit priority □ Yes □No

b. Interested and motivated staff □Yes □No

c. Standardized assessment tools are in use □Yes □No

d. Protocols and guidelines are in use □Yes □No

e. Physicians prescribe adequate doses of analgesia □Yes □No

f. Ongoing education on pain is provided □ Yes □No

g. Advanced practice nurse(s) are employed by on the unit □ Yes □No

h. Hospital pain service consults in the unit □Yes □No

i. Others (please identify)
_____
_____
_____

PAIN EDUCATION

20. Have you read the any Guidelines for pain assessment & management for critically ill patients?

□ Yes □ No

If yes, please specify _____

21Have you received education on the following topics during your professional development as a nurse who cares for critically ill patients?

a. Pain physiology mechanisms	□ Yes	□ No
b. Pain assessment methods and tools in the critically ill patient	□ Yes	□ No
c. Physiological consequences of unrelieved pain	□ Yes	□ No
d. Psychological consequences of unrelieved pain	□ Yes	□ No
e. Painful conditions and procedures	□ Yes	□ No
f. Pharmacological pain management principles/strategies	□ Yes	□ No
g. Non-pharmacological pain management principles/strategies	□ Yes	□ No
h. Practice recommendations/ guidelines	□ Yes	□ No

DEMOGRAPHIC DATA

22. Gender
    1. Male □
    2. Female □

23. Age :---------- years

24. Rank
    1. Enrolled □
    2. Registered □

25. How many years of experience do you have as a nurse registered by the Council?

□ less than 2 years □ more than 5-10 years
□ 2-5 years □ more than10 years

26. How many years of experience do you have as a nurse on this unit or caring for critically ill patients?

□ less than 2 years □ more than 5-10 years
□ 2-5 years □ more 10 years

27.Qualifications (tick all that apply)

□ Certificate □ BScN/BNS
□ Diploma □ Masters
□ other specify_____

28. Employment status

□ Full-time □ Part-time

29. Usual shift rotation

□ Days only □ Evenings only □ Nights only □ Rotating shifts

30. Please identify the primary specialty of the critically ill patient care in which you are most experienced:
□ Surgical (only) □ Cardiovascular (only) □ Burns (only) □ Medical (only □ Trauma (only)
□ Combined ICU (e.g. medical/surgical/trauma) □ Neuroscience (only)

Please identify combined specialties: _____

APPENDIX IV: Informed consent

Title: Nurses' knowledge and practices related to pain assessment in critically ill patients at Mulago Hospital.

Introduction

Ms Irene Betty Kizza, a student of Master of Nursing in Critical Care and Trauma at Muhimbili University of Health and Allied Sciences (MUHAS) in Tanzania. She is conducting a study on pain assessment practices, knowledge, barriers among nurses caring for critically ill patients.

This form is meant to explain to you the important details of the study, before you decide whether or not to participate in it. You must understand its purpose, how it may help you, any risks associated with participation and what is expected of you once you decide to participate in the study.

Purpose of the Study

The purpose of the study is to obtain information that will be used to gain insight into current pain assessment practices and to determine the direction of future interventions at Mulago Hospital. There is also hope that the information will be used by the Uganda Nurses and Midwives Council and Ministry of Health to design appropriate strategies that enable nurses caring for critically ill patients to ensure optimal comfort for their patients for better patient outcomes in Uganda.

Your rights as a Research Volunteer

This consent form gives you information about the study, which will also be discussed with you. Once you understand the study and agree to participate, you are asked to sign the form. You will be given a copy of the signed form to keep. Your participation in this research is entirely voluntary. You may decide to withdraw from the research at any time. If you decide to withdraw from the research, that decision will not affect you in any way.

Study Procedure

The study will take about two months but you will be required to participate only once. The study will involve filling a questionnaire. If you decide to participate in the study, you will be given a questionnaire with questions about pain assessment and management for critically ill patients. Filling the questionnaire will about 45 minutes.

Potential Risks

There are no risks associated with your participation.

Potential Benefits

There are no immediate benefits from the study. However, results of the study will be used to design strategies to improve the services delivered to critically ill patients who may be of benefit to you, your patients and nursing profession as whole.

Compensation

There are no costs or payments to you for participating in the study.

Confidentiality

A study number, which will be only known to the authorized study personnel and yourself, will be used instead of your name. Personal and any other information about you will not be released to anyone other than the following without permission; authorized study personnel, Muhimbili University of Health and Allied Sciences, Makerere University and /or Ministry of Health. You will not be personally identified in any publication or presentation about the study.

Questions

If you have any questions about the research please contact Ms Irene Betty Kizza at Departmenent of Nursing, Makerere University College of Health Sciences on telephone number 0782058030. If you have any questions about your rights as a research volunteer, you may contact the MUHAS research and Ethics Committee on Tel. number +255-21503026.

Participant's consent

_____has explained to me what is going to be done; the risks and benefits involved and will be available for questions at the Department of Nursing, Makerere University College of Health Sciences, on telephone number 0782058030. I understand that my decision to participate or not to participate in this study will not alter usual work. In the use of information generated from this study such as presentations and publications, my identity will remain anonymous. The records of the study must be available to only authorized study personnel, Muhimbili University, Makerere University, Uganda Nurses and Midwives Council and/ or Ministry of Health and my identity may get known to them. I am aware that I may withdraw from the study at any time.

I understand that by signing this consent form, I do not waive any of my legal rights but merely indicates that I have been informed about the study in which I am voluntarily agreeing to participate. A copy of this form will be provided to me.

_____ _____

Volunteer's signature Date