UNIVERSITY OF NAIROBI, COLLEGE OF HEALTH SCIENCES

A SURVEY OF KNOWLEDGE, ATTITUDE AND PRACTICE OF SEDATION AND ANALGESIA AMONGST NURSES WORKING IN THE KENYATTA NATIONAL HOSPITAL INTENSIVE CARE UNIT

DR. CAROLINE M.MWANGI-H58/70873/07

A DISSERTATION PRESENTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF MEDICINE IN ANAESTHESIA AND CRITICAL CARE OF THE UNIVERSITY OF NAIROBI

SUPERVISORS:

Dr Mark V. Gacii, *MBChB, MMed. Anaesthesia (Nairobi)*
Lecturer, Anaesthesia section, Department of Surgery, University of Nairobi and Consultant Anaesthesiologist, Kenyatta National Hospital.

Dr Charles E. Kabetu, *MBChB, MMed. Anaesthesia (Nairobi)*
Deputy Director Clinical Services (DDCS) and Consultant Anaesthesiologist, Kenyatta National Hospital.

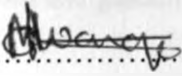**INVESTIGATOR**
Dr. Caroline M. Mwangi *MBChB (Nairobi)*
H58/70873/07
Post Graduate student in Anaesthesia
College of Health Sciences, University of Nairobi

DECLARATION

This dissertation is my original work and to my knowledge has not been presented for any award in this university.

.... Date...16TH...HOVEMBER.2010...

Dr Caroline M. Mwangi, *MBChB* (Nairobi)
Post Graduate student in Anaesthesia
University of Nairobi

This dissertation has been submitted for examination with our approval as the supervisors

.... Date..17th.NOVEMBER.2010

Dr Mark V. Gacii, *MBChB, MMed. Anaesthesia (Nairobi)*
Lecturer, Anaesthesia section, Department of Surgery, University of Nairobi and Consultant Anaesthesiologist, Kenyatta National Hospital.

.... Date..23rd..nov.,.2010...

Dr Charles E. Kabetu, *MBChB, MMed. Anaesthesia (Nairobi)*
Deputy Director Clinical Services (DDCS) and Consultant Anaesthesiologist, Kenyatta National Hospital.

iii
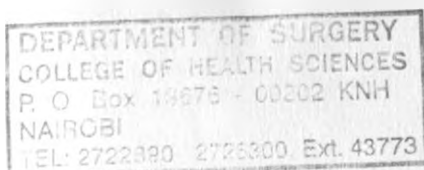
ACKNOWLEDGEMENTS

My appreciation and gratitude to:

My supervisors, Dr M.V Gacii and Dr C.E Kabetu, for their positive, invaluable and constructive criticism and guidance right from the drafting of the proposal to the final stage.

Colleagues and friends, for their words of encouragement and wisdom in times of need.

The KNH ICU nurses for participating in the study.

The Almighty God, Great is thy faithfulness.

DEDICATION

This thesis is dedicated to:

The critical care patient, whose safety and well being shall perpetually be the primary goal of care.

My parents, Mr. Eliud Mwangi Githae and Mrs.Gladys Mumbi Githae, who have inspired, encouraged and walked with me right from childhood.

My *fiancé* Dr Wachira Ngatia for his unreserved support and understanding during the training period.

TABLE OF CONTENTS

Appendices:

LIST OF ABBREVIATIONS

ICU   Intensive Care Unit

KNH   Kenyatta National Hospital

NRS   Numeric Rating Scale

SCCM   Society of Critical Care Medicine

VAS   Visual Analogue Scale

VRS   Visual Rating Scale

LIST OF FIGURES AND TABLES

List of Figures

List of Tables

SUMMARY

Background

Sedation and analgesia are necessary for the alleviation of anxiety and pain so as to improve patient comfort and facilitate medical interventions such as mechanical ventilation, tracheal intubation and other invasive procedures in the Intensive Care Unit.

Objective

To explore the knowledge, attitude and practice of sedation and analgesia amongst nurses working in the Kenyatta National Hospital Intensive Care Unit.

Methods

A cross sectional descriptive study of the knowledge, attitude and practice of sedation and analgesia amongst nurses working in the Kenyatta National Hospital Intensive Care Unit. The target population included all nurses working in the KNH CCU. Data was collected using a pre-tested questionnaire. The hardcopies were filed after transcription of the information into a Microsoft Excel™ database. Data was analyzed using the Statistical Package for Social Sciences (version 11.0; SPSS, Chicago, IL)

Results

There was a 90% response rate. Most respondents were aged between 30 and 35 years of age.75% of the respondents had a higher diploma in critical care.40.7% the respondents had practiced as nurses for between six and ten years while 60.2% of them had practiced as intensive care nurses for less than 5 years. 75.94% of the respondents correctly answered most questions meant to assess current knowledge of analgesia and sedation management in the ICU. In the management of anxiety, an average of 68% of the respondents who consistently reduced noise, switched off lights, comforted patients and used pharmacological agents, had attained a Higher Diploma in Critical Care. Of these, those who consistently reduced noise (*n = 3out of 5, 60%*), switched off lights (*n = 2 out of 2, 50%*), comforted

patients (*n = 36 out of 57, 63.2%*) and used pharmacological agents (n = *18 out of 24, 75%)* had less than five years work experience in the ICU. Similarly in the management of pain it was shown that on average 80% of the respondents who consistently explained the procedure, turned, massaged patient and used pharmacological agents had a Higher Diploma in Critical Care. Further, most of these respondents who consistently explained the procedure (*n = 23 out of 35, 65.7%*), turned patient (*n= 36 out of 58, 62%*), massaged patient (*n = 19 out of 28, 67.8%*) and used pharmacological agents (*n = 30 out of 46, 65.2%*) were nurses who had practiced in the ICU for less than five years.

Conclusion

Whereas the knowledge of sedation and analgesia management by the nurses in this survey is generally good there is a disconnect between their level of knowledge and their practice. The nurses indicated that it is very important to standardize the approach towards sedation and analgesia management preferably through a nurse driven protocol.

INTRODUCTION

The maintenance of an optimal level of comfort and safety for critically ill patients is a universal goal for critical care practitioners [1]. The American College of Critical Care Medicine (ACCM) of the Society of Critical Care Medicine (SCCM) practice parameters for the optimal use of sedatives and analgesics was published in 2002 and recommended a tiered approach to the use of sedatives and analgesics, largely on the basis of expert opinion [2].

Sedation and analgesia protocols have been acknowledged as providing clear guidelines with expressed targets for practitioners. Protocols should be viewed as tools that assist in decision making and reduce inappropriate variations in clinical practice. Use of protocols has been perceived as improving outcomes due to better patient assessment, promoting systematic thinking about sedation and analgesia, and providing a learning tool for inexperienced practitioners [3].

The indications for sedation and analgesia are individualized to each patient receiving treatment within an intensive care environment. No sedative or analgesic agent is considered 'ideal' for administration to critically ill patients and they may need several drugs to achieve comfort and tolerance of procedures [4].

Intensive care nurses are usually the health team members who work with patients most intensely over extended periods of time, and therefore are in the best position to recognize anxiety and pain in a patient. Protocols specifically designed for implementation by nurses have been shown to improve patient outcomes. This is because of the rapid clinical decision making that occurs at the patient's bedside. Intensive care nurses must be able to assess anxiety and pain accurately and quickly act on it because of the high prevalence and potentially serious effects in critically ill patients. The impact of this role depends on the knowledge, experience and confidence of the nurse [5].

KNH is a national referral (Level VI) hospital with a bed capacity of two thousand patients. It has forty nine inpatient wards, twenty three operating theatres and a twenty one bed capacity intensive care unit. The intensive care unit is a non specialized unit which receives admissions from inpatient wards, operating theatres, the accident and emergency department and transfers from other hospitals. There are three nurse work shifts per day in the ICU. The nurse to patient ratio is 2:3 [6].

LITERATURE REVIEW

Intensive care therapy often includes sedation and analgesia management for critically ill patients in order to tolerate painful or unpleasant events either caused by the underlying disease process or medical interventions. The critically ill patient if not sedated will be anxious and frightened because of the disease and its unpredictable consequences. The environment itself is unpleasant, strained and frightening with its noise and uncommon sounds, the monitoring devices creating noisy alarms and the scene often brightly illuminated. Many patients are even mentally confused or delirious and therefore misinterpret the environment if inadequately sedated [7].

Numerous medical/neurological conditions and ICU procedures are painful and lend themselves to analgesic management. These include: postoperative wound and incision discomfort; trauma, including soft tissue injury, burns, bone fractures; acute myocardial ischemia and myocarditis; visceral organ pain and acute abdomen; endotracheal tube irritation; invasive line placement; prolonged immobility and turning of patients [8].

According to the United Kingdom Central Council's (UKCC) 'Code of Conduct' (1992), nurses have a professional responsibility for the safety of the patients in their care and should be aware that unrelieved pain and distress may lead to emotional and physical exhaustion which can have a significant impact on patient well-being, overall prognosis and recovery [9]. When assessing needs and planning care this should be of primary concern to any intensive care nurse in the role of patient advocate [9].

Management of Sedation and Analgesia

Non-pharmacologic management should be considered first in the management of pain, anxiety and agitation in the ICU. These include; establishing a method of nonverbal communication (blinking or head nodding);using a calm voice and gentle touch to convey reassurance; proper positioning; elimination of irritating physical stimulation (such as proper positioning of ventilation tubing to avoid traction to the endotracheal tube);using distractions (such as listening to music, watching television);making environmental changes (such as noise reduction) and using complementary therapies (such as aromatherapy and massage therapy)[10].

2

In 2002 the Society of Critical Care Medicine (SCCM), along with the American Society of Health-System Pharmacists, updated recommendations in its clinical practice guidelines on the sustained use of sedatives and analgesics in adults [10]. In choosing the appropriate pharmacologic sedative and analgesic, it is important to understand the pharmacodynamics, pharmacokinetics and adverse drug reactions of each agent. The ideal sedative and analgesic agent has been described as one that works rapidly; provides anxiolysis, sedation, amnesia, analgesia or a combination of these; allows quick emergence when stopped; permits easy administration and adjustment of dosage; produces no active metabolites, has no significant adverse effects, or drug interactions; and is inexpensive. No drug meets all these criteria[10].

The major classes of medications used to promote comfort and tolerance of the ICU environment are the sedative-hypnotic agents and opioid analgesics, which provide anxiolysis, sedation ,amnesia and analgesia to the patient [7].The commonly used sedatives include: benzodiazepines (diazepam, midazolam and lorazepam);ketamine; antipsychotics (haloperidol); opioids (morphine sulphate, fentanyl, hydromorphine, meperidine,remifentanil)[11].

The SCCM guidelines on end points and awakenings include the following recommendations:-

- Titrating the sedative dose to a defined end point is recommended along with systematic tapering of the dose or daily interruption with re-titration to minimize prolonged sedative effects.
- The potential for opioid, benzodiazepine, and propofol withdrawal symptoms should be considered after high doses or more than approximately seven days of continuous therapy. Doses should be tapered systematically to prevent withdrawal symptoms.
- The use of sedation guidelines, an algorithm, or a protocol is recommended.

Opioid analgesics are the class of drugs primarily used for pain management in the intensive care setting. Opioids commonly used in the ICU setting include morphine, fentanyl, remifentanil, pethidine and tramadol [12]. The optimal choice of opioid and dosing regimen for a specific patient will vary depending on factors such as the pharmacokinetics and physicochemical characteristics of an opioid and the body's handling of the opioid, concomitant sedative regimen, potential or actual adverse drug events, and development of tolerance [12].

A variety of medications have been proposed as alternatives to opioids for pain control in critically ill patients. This is due to their lack of opioid associated side effects such as respiratory depression and constipation hence reduce length of ICU stay. These include non-steroidal anti-inflammatory drugs, acetaminophen, antidepressants-tricyclics, serotonin selective reuptake inhibitors, local anaesthetics, baclofen, clonidine, dexmedetomidine, dextromethophan, ketamine and corticosteroids [12] [13].

In intensive care medicine sedatives and analgesics are most often administered intravenously by bolus, continuous infusion or by nursing and /or patient controlled analgesia system. Administration of sedatives by continuous infusion has been identified as an independent predictor of a longer duration of mechanical ventilation as well as a longer stay in the intensive care unit and in hospital [14]. Daily interruption of sedative infusions to allow patients to "wake up" improved the situation by allowing clinicians to streamline the administration of sedatives while ensuring optimal comfort for patient [15].

As part of their treatment, patients receive many potent drugs that need to be titrated in relation to their effects. Titration of these drugs is generally carried out by the nursing staff. It is therefore important for nurses to be aware of not only the side effects of the drugs in use, but also the effects of under- and over-sedation [16].

Effects of Sedation and Analgesia

The benefits of sedation must be balanced with the detrimental side effects of the drugs used to achieve it and the risks associated with under or over-sedation. Over-sedation may lead to respiratory depression, hypotension, bradycardia, paralytic ileus, renal failure, venous stasis, immunosuppression, prolonged ventilation time and increased length of ICU and hospital stay, with a resulting increase in nursing workload. Prolonged ventilation times may result in other complications, including ventilator induced pneumonia, barotrauma and unanticipated extubation during procedures with resultant desaturation [11] [17].

Under-sedation also results in a range of complications. These include tachycardia, hypertension, increased cardiac contractility, increased afterload, dysrhythmias and ventilator-patient dysynchrony leading to hypoxia, increased systemic and myocardial oxygen consumption, hyperglycaemia and

increased neurometabolism [18]. Patient agitation and restlessness may result in removal of arterial and venous catheters, contusions, lacerations and fractures [18].

Uncontrolled pain has potential detrimental effects which include impaired diaphragmatic function and coughing reflex, restricted ventilation, increased cardiac output and vascular resistance and enhanced myocardial oxygen consumption. The neuro-endocrine pain-stress response is characterized by increased catabolic hormones which result in hyperglycemia and increased protein breakdown [19].

Studies done to explore intensive care nurses' beliefs about the importance of anxiety management and describe nurses' reported use of strategies to manage anxiety in their patients showed that practicing intensive care nurses were aware that anxiety may be harmful, even potentially life threatening, to their patients and that anxiety management is an important and beneficial component of their care. They also reported that they use a number of interventions to treat anxiety in their patients. The intervention most commonly used to manage anxiety in their patients was pharmacological: ensuring that pain relief is adequate and administering anti-anxiety drugs. Other interventions used by the intensive care nurses were information and communication interventions with the patient [5 20 21].

Frazier et al, in a study done to determine the importance that intensive care nurses place on evaluating anxiety and to describe clinical indicators used to assess anxiety, showed that agitation and patients' verbalization of anxiety, were rated as very important to anxiety assessment. Other indicators of anxiety identified by the nurses were increased blood pressure, increased heart rate, and patients' restlessness [22].

Moser et al demonstrated that intensive care nurses identified physiological and behavioural changes as indicators of anxiety. Physiologic indicators included increase in heart rate, respiratory rate and blood pressure. Behavioural indicators included agitation, tension, and failure to cooperate with care and changes in verbalization by the patient. Strategies used to manage anxiety included administration of sedative medication, provision of reassurance to the patient about status and progress and control of environmental stressors such as noise and lighting [5].

Sedation and Analgesia Scoring Systems

The practice towards the use of sedation and analgesia in patients within intensive care environments has changed over time. In a survey reviewing the practice of intensive care sedation in 34 leading ICUs in Great Britain and Northern Ireland in 1981, it was reported that 67% of those in charge of ICUs preferred their patients to be deeply sedated, unaware of their surroundings and only woken on occasion [23]. Thereafter, a postal survey in 1987 of all general ICUs in the United Kingdom regarded the 'ideal' level of patients' sedation to be 'asleep but easily rousable' [24]. This trend in practice appears to have been maintained as a subsequent survey, reported that 70% of units preferred their patients to be lightly sedated, easily aroused and with periods of sleep [25]. The current practice of sedation in ICU reflects that preferred in the two later surveys above [25].

Sedative agents were concurrently used with muscle relaxants to facilitate controlled ventilation but the use of muscle relaxants has decreased over the years. In 1981 in the United Kingdom, regular use of muscle relaxants was reported in over 90% of units [23]. In a later survey done in the United Kingdom, the use of muscle relaxants was reported in 16% of units in 1987 and 15% of units in 1991 [25]. This change in practice was attributed to the use of ventilators with patient triggered modes of respiratory support [25]. The majority of ventilators now incorporate synchronized intermittent mandatory ventilation modes which allow patients to breathe spontaneously as desired between mandatory breaths. Using the synchronized intermittent mandatory ventilation mode, the incidence of 'fighting the ventilator' is minimized and therefore the need for muscle relaxants is also greatly reduced hence sedatives can be used solely for sedation management [26]. Ritz showed that the change from complete to partial sedation appears to have run a course parallel to the change in ventilation techniques from completely controlled ventilation to the more commonly used support ventilation in current practice [27].

Traditionally, sedative and analgesic agents are prescribed by physicians and administered by nurses, often with a wide margin of discretion in dose and without explicit understanding of the target level of sedation or analgesia[28]. It has been shown that different physicians have different approaches to analgesics/sedatives, resulting in marked variation in the type and method of anxiety and pain management [28]. Nurses are constantly at the bedside and are in a good position to assess the origin of patients anxiety and pain hence are generally better able to evaluate patients' sedation and analgesic

needs as compared to the physicians who, because they see patients less frequently may not appreciate their sedation and analgesia requirements [1].

Current sedation and analgesia research focuses on two areas: the development and use of sedation and analgesia scales and protocol-directed sedation and analgesia management. Their management, whether in the form of sedation and analgesia protocols or clinician-directed management, involves clinical decision making processes [29].

It has been acknowledged that sedation practice is often based on personal beliefs and attitudes rather than conclusive clinical studies on patient outcomes. This may lead to conflict amongst health professionals when their attitudes or priorities differ [30]. The level of sedation and analgesia is assessed in many ICUs using a sedation and analgesia scale. Useful features of a sedation and analgesia scales include rigorous multidisciplinary development; ease of administration, recall, and interpretation; well-defined discrete criteria for each level; sufficiency sedation and analgesia levels for effective drug titration; assessment of agitation and pain; demonstration of inter-observer reliability for relevant patient populations; and evidence of validity [26 31].

Sedation scales are behavioural, observational scales correlating different levels of sedation with the responses to verbal or physical stimulation. Some of the sedation scales commonly used include the Ramsay Sedation Scale, the Richmond Agitation Sedation Scale and the Adden Brooke's sedation scale [32].

The most reliable and valid indicator of pain is the patient's self-report. The location, characteristics, aggravating and alleviating factors, and intensity of pain should be evaluated [33]. The lack of adequate assessment of pain in sedated critically ill patients interferes with optimum pain management. When critical care patients are unable to self-report their pain intensity, comprehensive pain assessments should require an objective evaluation through the observation of pain indicators [13].

Assessment of pain intensity may be performed with one-dimensional tools, such as a verbal rating scale (VRS), visual analogue scale (VAS) and numeric rating scale (NRS)[34]. VAS comprises a 10cm horizontal line with descriptive phrases at either end from "no pain" to "severe pain". NRS is a zero to ten point scale and patients choose a number that describes their pain, with ten representing the worst

pain. Multidimensional tools, such as the McGill Pain Questionnaire and the Wisconsin Brief Pain Questionnaire, measure pain intensity and the sensory, affective, and behavioural components of that pain[34].

Critically ill patients are often unable to communicate their level of pain if sedated, anesthetized, or receiving neuromuscular blockade. Behavioural- physiological scales may be useful in assessing pain in these patients as they assess: pain-related behaviours such as movement, facial expression and posturing and physiological indicators such as heart rate, blood pressure, and respiratory rate [35]. Puntillo et al reported that behavioural indicators: body movements, facial expressions, and posturing in surgical patients could be rated correctly by nurses. There was a moderate to strong correlation between the behavioural items observed by the patients' nurse and the patients' self-report of pain intensity [36].

Chanques et al assessed the impact of implementation of the systematic evaluation of pain and agitation by nurses using the Behavioural Pain Scale, the Numerical Rating Scale (NRS) for pain, and the Richmond Agitation Sedation Scale associated with medical staff education in analgesia and sedation management in ICU patients. Their main finding was that systematic evaluation of pain and agitation levels by nurses decreased the observed incidence and intensity of pain and agitation in ICU patients. This improvement in pain and agitation management was associated with better outcomes like shorter duration of mechanical ventilation and lower rates of nosocomial infections [37]

Sedation and Analgesia Protocols

Westcott et al assert that the use of sedation scales should be combined with an agreed sedation protocol [9]. Protocols consist of written recommendations, rules or standards where rational procedures can be specified. It has been observed that nurses, who are constantly at the bedside, are generally better able to evaluate patients' sedation and analgesia needs as compared to physicians. There is thus a need to implement a nursing sedation and analgesia protocol combined with a sedation and agitation scale[38]. This has been found to establish consistency between nurses and physicians, standardize methods of care and decrease errors in the administration of sedation and add value to patient management [28,38]. Brook et al demonstrated that establishment of a nurse –implemented sedation protocol decreased the duration of mechanical ventilation for patients in the intensive care unit and reduced the total duration of continuous intravenous sedation hence reduced the effects of over sedation [39].

Nursing staff in an Australian intensive care unit perceived sedation management to be enhanced with the use of a sedation protocol based on achieving a set sedation target. They agreed that sedation practices should be standardized using a sedation protocol. The sedation protocol was acknowledged as providing clear guidelines with expressed targets for practitioners [29].

Fry et al established that implementation of a nurse-driven sedation and analgesia protocol was generally supported by nursing staff [3]. The nursing staff felt that the guidelines for sedation allowed them to use their clinical assessment skills while providing for patient comfort. Satisfaction with the sedation guidelines was attributed to the inclusion of nurses throughout the protocol design process. A nurse-driven protocol gave nurses a sense of ownership and reduced ambiguity over sedation practices by implementing explicit and measurable standards within decision making [3].

A study by Alexander et al to evaluate a sedation protocol that transfers some decision-making authority for analgesia and sedation, within clearly defined parameters, to nurses in a pediatric intensive care unit showed that the use of a sedation protocol appeared to moderate the severity of under-sedation incidents. The use of a protocol enables efficient intervention and avoids the need for negotiation since the goals are pre-established. The majority of nurses surveyed linked the use of the protocol with facilitated team decision-making and improvement in patient outcome [40].

Walker et al demonstrated that the use of a sedation score enhances the nurse's role in assessment of the depth of sedation. The use of objective scoring systems was shown to improve clarity for nurses when agreeing target levels of sedation for a particular patient [41]. The nurse's role in sedation management is supported by other studies that demonstrated that nurses manage the dose and frequency of sedation by titrating sedation within prescribed limits, to achieve the agreed target level [21 42 43].

Sedation and analgesia management differs with level of training and years of experience. Inexperienced nurses are sometimes unfamiliar with the medications and the doses required resulting in patient anxiety and discomfort due to under dosing [21]. The aim of the nurse is to administer sedation and analgesia appropriately to allow the nursing and medical care required with no deleterious effect on the patient. To enable effective sedation, nurses require knowledge and skills to provide the beneficial effects of sedation while avoiding both over and under sedation [11].

It is recommended that a team approach to the management of sedation and analgesia should incorporate an evidence based sedation and analgesia protocol [21]. The overall goals of sedation and analgesia therapy should be made explicit to provide clarity to the medical and nursing team. An agreed plan of care for each patient should clearly identify an optimal target sedation and analgesia level using a sedation and analgesia scoring tool. This optimal level should be linked with the overall goal and the patient's requirements for respiratory support and vice versa. Induction and education programmes about sedation and analgesia therapy should be in place for all nurses in intensive care. This should aim to develop knowledge, skills and confidence to improve decision-making about sedation management at the bedside [5][21].

Kenyatta National Hospital has a KNH-ICU/HDU Protocols Booklet prepared by the KNH –ICU/HDU users committee in 2004. It consists of different protocols including the role of the nurse and the doctors working in the ICU, sedation management in the ICU, ICU equipment care and the transfusion of blood products. It states that the doctor is the one who reviews the treatment sheets and the sedation scores. It also lists the sedation scales that can be used in the ICU and the different drugs available for use and their side effects. The role of the intensive care nurse in management of sedation and analgesia is not defined in the booklet [44].

STUDY JUSTIFICATION

The ICU nurse plays a key role in the management of pain and anxiety. The drugs are prescribed by the doctors but are administered by nursing staff who are responsible for titrating the drugs infused and monitoring their effects. The impact of this role depends on the knowledge, experience and confidence of the nurse.

Nursing staff with varying degrees of expertise will change shifts several times over the working day. This means that patients undergo subjective assessments of their individual sedation and analgesia requirements by several members of staff, which may result in patients receiving varying doses of sedation depending on who has performed the assessment.

Currently, the KNH-ICU/HDU Protocols Booklet has recommendations on sedation management in ICU. These include objective assessment of sedation using sedation scores to ensure patient comfort. It describes different pharmacological interventions used for sedation and analgesia, their indications, drug interactions and contra-indications. It is silent though on who assesses the sedation and analgesia levels and what particular intervention is to be applied for a particular sedation and analgesia level.

There is no local data available on this subject and this study aims to provide baseline data that would help in developing appropriate sedation and analgesia protocols and help in the planning for training needs for staff working in the intensive care unit.

OBJECTIVES:

BROAD OBJECTIVE

To explore the knowledge, attitudes and practices of nurses working in KNH ICU about their role in sedation and analgesia management in patients.

SPECIFIC OBJECTIVES.

- To explore KNH ICU nurses beliefs about the importance of anxiety and pain management in critically ill patients.
- To determine the knowledge of KNH ICU nurses on pain and anxiety management.
- To determine the strategies they use to manage pain and anxiety requirements.
- To determine their attitude towards the use of protocols.

MATERIALS AND METHODS

STUDY DESIGN

Cross sectional descriptive study of the knowledge, attitude and practice of sedation and analgesia amongst nurses working in the Kenyatta National Hospital Intensive Care Unit.

STUDY SITE

Kenyatta National Hospital -Intensive Care Unit

STUDY POPULATION

The target population for this research was all nurses working in the Kenyatta National Hospital, Intensive Care Unit.

INCLUSION CRITERIA

All nurses working in the KNH-ICU who gave consent.

EXCLUSION CRITERIA

Nurses working in the KNH-ICU who did not give consent to participate in the study.

Nurses who were not available and were not within reach during the study period.

Nurses who were working in the ICU on a temporary basis.

THE STUDY QUESTIONNAIRE

The study questionnaire consisted of three sections:
1. Section one :Consisted of four (4) questions related to demographic data on age, level of education and years of practice as a nurse
2. Section two: Consisted of six (6) questions about the nurses' attitude and practice towards sedation and analgesia.
3. Section three: Consisted of nine (9) questions regarding knowledge on pain and anxiety management.

STUDY QUESTIONNAIRE ADMINISTRATION

The questionnaire and a letter informing the participants of the study were hand delivered to the participants by the principal investigator. All the participants were asked to complete the questionnaire independently.

DATA STORAGE AND MANAGEMENT

Data was collected using a pre-tested questionnaire. The hard copies were filed after transcription of the information into a Microsoft Excel™ database. The hard copies and the database were treated with strict confidentiality. Data was analyzed using the Statistical Package for Social Scientists (version 11.0; SPSS, Chicago, IL).

ETHICAL CONSIDERATIONS

Approval for this study was obtained from the Kenyatta National Hospital-Ethics Research Committee.

Subject identifiers were omitted from data analysis so as to protect the subjects.

All recommendations avoid reference to specific subjects.

RESULTS

Figure 1: Age of participant in years

Age of participants
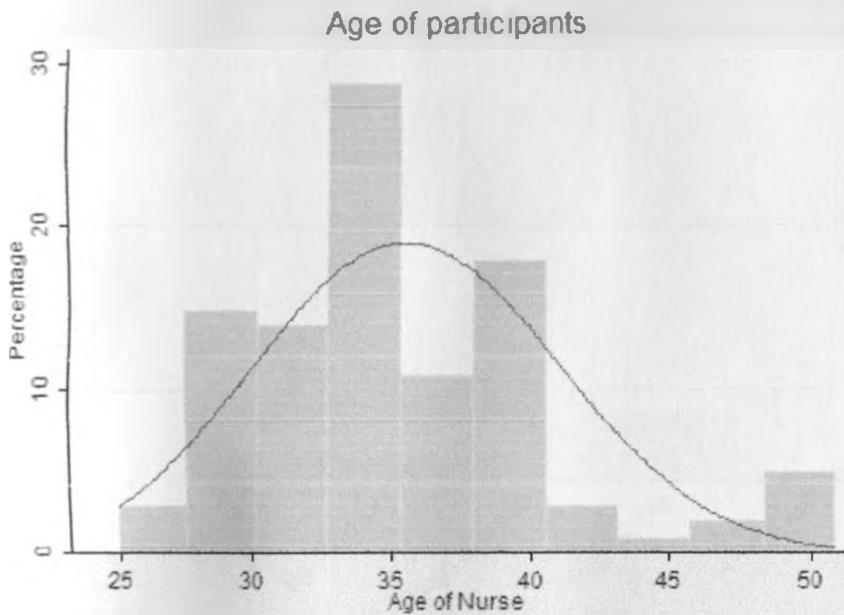
One hundred and eight nurses out of a total of one hundred and twenty responded to the questionnaire (90% response rate).Most respondents were aged between 30 and 35 years. The age range was 25 to 51 years (mean age 35.6 +/- 5.5 years; most were in the 25-35 year age range)

Highest level of Education
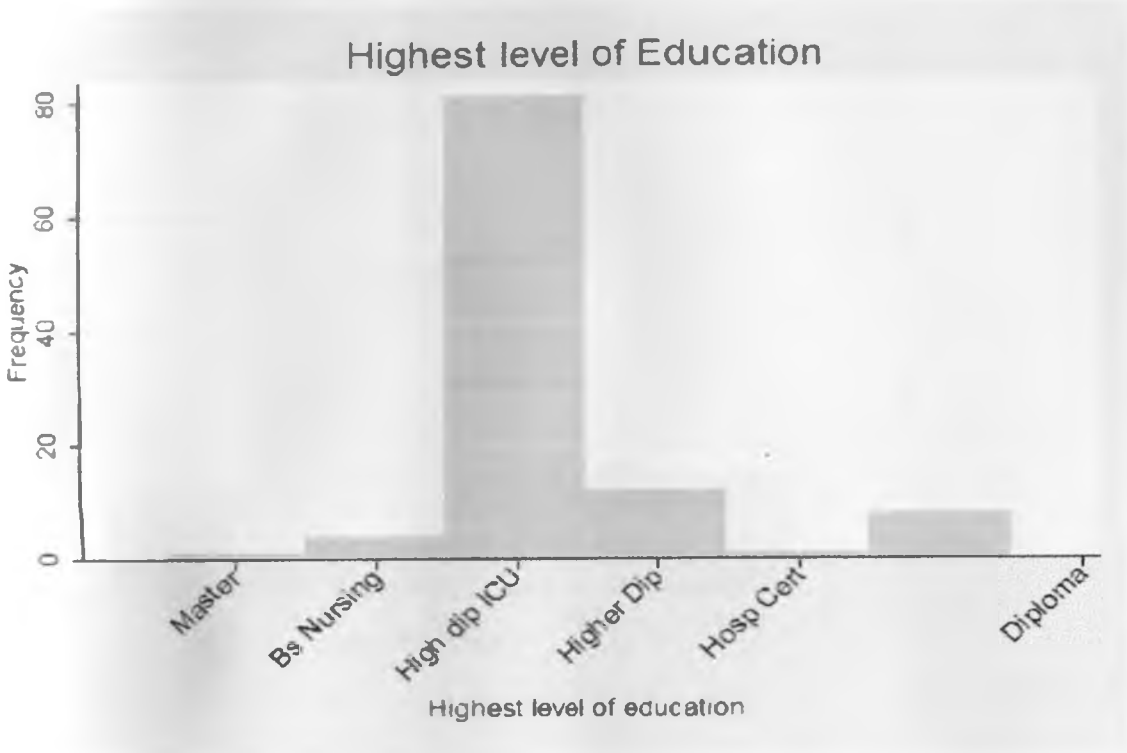
As shown above, the majority of the study respondents (75%) had a higher diploma in critical care as their highest level of education.

Figure III: Graph showing years of practice an a nurse

40 7% of the respondents had practiced as nurses for 6-10 years and 21.8% of them had practiced for 11-15 years.

Figure IV: Graph showing years of practice as an ICU nurse

Years of practice as an I.C.U nurse
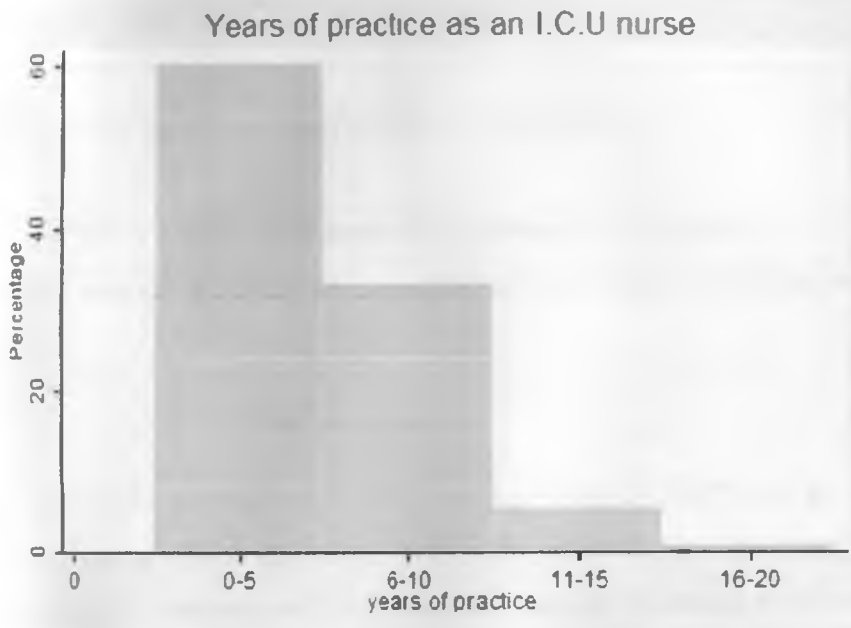
60% of the nurses had practiced as ICU nurses for 0-5 years; with a minority, 6.5%, having more than 10years experience in ICU nursing.

Table I: Knowledge of KNH-ICU/HDU protocol booklet

In reference to the KNH-ICU/HDU booklet:-	Yes *n* (%)	No *n* (%)
Have you read the sedation and analgesia guidelines in it?	18 (16.7%)	90 (83.3%)
Do you find the sedation and analgesia guidelines in it adequate?	8 (44.4%)	10 (55.6%)
Do you practice the sedation and analgesia guidelines according to the booklet?	3 (16.7%)	15 (72.3%)

In reference to the KNH-ICU/HDU protocol booklet 16.7% of the study population has read the sedation and analgesia guidelines in it.44.4% of those who have read find the sedation and analgesia guidelines in it adequate and 16.7 % of them practice according to the booklet guidelines.

Table II: Knowledge on treatment of anxiety and pain

Knowledge on treatment of anxiety and pain	Those who responded correctly	
	Frequency (*n*)	N% correct
It is possible to treat pain without treating anxiety	64	59.3%
Patients not adequately treated for pain and anxiety may suffer complications such as ICU psychoses	87	80.6%
Analgesics may decrease the amount of anxiety in a patient	96	88.9%
A sedation/analgesia protocol allows us to evaluate the effectiveness of our sedation and analgesia	91	84.3%

The average correct response rate was 78.3%

88.9% of the nurses know that analgesics may decrease the amount of anxiety in a patient and 59.3% of them know it is possible to treat pain without treating anxiety.

Table III: Knowledge of drugs used for sedation

The following drugs can be used for sedation in the ICU :	Those who responded correctly	
	Frequency (*n*)	N% Correct
Paracetamol	102	94.4%
Diclofenac	100	92.6%
Pethidine	55	50.9%
Morphine	88	81.5%
Tramadol	91	84.3%
Fentanyl	64	59.3%
Remifentanil	75	69.4%
Midazolam	**103**	**95.4%**
Diazepam	97	89.8%
Ketamine	91	84.3%
Propofol	77	71.3%
Haloperidol	**38**	**35.2%**

The average correct response rate was 75.7%

94.4 %of the respondents know that paracetamol and diclofenac (92.6%) are not used for sedation while 95.4% of them know that midazolam can be used for sedation in the ICU.35.2% of the nurses know that haloperidol can be used for sedation.

22

Table IV: Knowledge of drugs used for analgesia

The following drugs can be used for analgesia in the ICU	Those who responded correctly	
	Frequency (*n*)	N% Correct
Paracetamol	100	92.6%
Diclofenac	**105**	**97.2%**
Pethidine	104	96.3%
Morphine	99	91.7%
Tramadol	**105**	**97.2%**
Fentanyl	64	59.3%
Remifentanil	62	57.4%
Midazolam	80	74.1%
Diazepam	92	85.2%
Ketamine	**40**	**37%**
Propofol	86	79.6%
Haloperidol	84	77.8%

The average correct response rate was 78.8%.

97.2% of the nurses know that diclofenac and tramadol can be used for analgesia while 37% of them know that ketamine can be used for analgesia.

Table V: Knowledge of the effects of over and under sedation

The following are associated with over-sedation in the ICU patient :-	Those who responded correctly	
	Frequency (*n*)	N% correct
Prolonged ventilation times	88	81.5%
Respiratory depression	**100**	**92.6%**
Bradycardia	69	63.9%
Ventilator induced pneumonia	59	54.6%
Paralytic ileus	**41**	**38%**
Venous Stasis	60	55.6%
The following are associated with under sedation in the ICU patient:-		
Tachycardia	**101**	**93.5%**
Hypertension	67	62%
Agitation	99	91.7%
Ventilator-patient dysynchrony	82	75.9%
Hypoxia	**36**	**33.3%**

The average correct response rate was 67.5%.

92.6% of the study population knows that over sedation may cause respiratory depression while 38% of them know that paralytic ileus may be caused by over sedation. 93.5% of the study population know that tachycardia and 36% of them know that hypoxia may be caused by under sedation.

Table VI: Knowledge of effects of uncontrolled pain

Uncontrolled pain may have the following effects in the ICU patient:-	Those who responded correctly	
	Frequency (*n*)	N% Correct
Tachypnoea	92	85.2%
Hypertension	91	84.3%
Tachycardia	**108**	**100%**
Hyperglycaemia	**44**	**40.7%**
Exhaustion	96	88.9%
Disorientation	84	77.8%

The average correct response on effects of uncontrolled pain was 79.4%.

All the study respondents know that uncontrolled pain cause's tachycardia while 40.7% of them know that uncontrolled pain causes hyperglycaemia.

Table VII: Level of satisfaction with sedation and analgesia practice

Sedation and analgesia rating in the aspect of	Strongly Satisfied n (%)	Satisfied n (%)	Neither satisfied nor dissatisfied n (%)	Dissatisfied n (%)	Strongly Dissatisfied n (%)
Evaluation	8 (7.4%)	72 (66.7%)	16 (14.8 %)	11 (10.2%)	1 (0.9%)
Adequacy	13 (12%)	68 (63%)	13 (12%)	14 (13%)	
Decision making	5 (4.6%)	61 (56.5%)	26(24%)	15 (13.9%)	1 (0.9 %)
Prescription by Doctors	11 (10.2%)	61 (56.5%)	18(16.6%)	16 (14.8%)	2 (1.9%)

The study population was satisfied with the CCU sedation and analgesia management with respect to: evaluation (66.7 %), adequacy (63%), decision making (56.5%) and prescription by doctors (56.5%).

Table VIII: Views on importance of standardized approached to sedation management

Sedation and analgesia degree of importance of :-	Very Important. n (%)	Important n (%)	Neither Important nor Unimportant n (%)	Not important n (%)	Very Unimportant n (%)
Implementation of a standardized approach	87 (80.6%)	17 (15.8%)	2 (1.8%)	1 (0.9%)	1 (0.9%)
A nursing implemented protocol	63 (58.3%)	39 (36.1%)	3 (2.8%)	3 (2.8%)	
The nurse in its assessment	70 (64.8%)	36 (33.4%)	1 (0.9)	1 (0.9)	

80.6% of the nurses reported that it is very important to implement a standardized approach to sedation and analgesia and 58.3% of them reported that a nursing implemented protocol is very important. 64.8% felt that the nurse is very important in its assessment.

Table IX: Views on importance of tools used to assess sedation

Degree of Importance in assessing sedation	Very Important n (%)	Important n (%)	Neither Important nor Unimportant n (%)	Not important n (%)	Very Unimportant n (%)
General appearance	**55 (50.9%)**	42 (38.9%)	5 (4.6%)	4 (3.7%)	2 (1.9%)
Patient's response to commands/ stimuli	**81 (75%)**	19 (17.6%)	5 (4.6%)	2 (1.9%)	1 (0.9%)
Breathing pattern	**91 (84.3%)**	15 (13.9%)	1 (0.9%)	1 (0.9%)	
Heart rate/pulse rate	**88 (81.5%)**	19 (17.6%)	1 (0.9%)		

84.3% of the respondents reported that the breathing pattern is very important in assessing sedation. Patient's response to commands/stimuli is reported as very important by 75% of respondents and heart/ pulse rate is considered very important in 81.5% of them.50.9% of the study respondents reported that the general appearance is very important in assessing sedation.

Table X: Views on importance of tools used to assess pain.

Degree of importance in assessing pain	Very Important n (%)	Important n (%)	Neither Important nor Unimportant n (%)	Not important n (%)	Very Unimportant n (%)
Facial expressions	78 (72.2%)	26 (24.1%)	4 (3.7%)		
Verbal response	53 (49.1%)	42 (38.9%)	8 (7.4%)	4 (3.7%)	1 (0.9%0
Heart rate/pulse rate	93 (86.1%)	14 (13%)	1 (0.9%)		
Breathing rate	83(76.8%)	24 (22.2%)	1 (%)		
Blood Pressure	68 (63%)	34 (31.4%)	4 (3.7%)	2 (1.9)	

In assessment of pain, heart rate /pulse rate 86.1%, facial expressions 72.2%, breathing rate 76.9% and blood pressure 63% are reported to be very important by the study population. 49.1% of respondents indicated verbal response is very important in assessment of pain.

Table XI: Frequency of use of techniques in management of anxiety.

Frequency use of the following in the management of anxiety	Consistently n (%)	Frequently n (%)	Occasionally n (%)	Infrequently n (%)	Never n (%)
Reducing noise in the ICU	5 (4.6%)	26 (24.1%)	47 (43.5%)	20 (18.5%)	10 (9.3%)
Switching off lights	2 (1.9%)	21(19.4%)	52(48.2%)	24 (22.2%)	9 (8.3%)
Comforting patient(verbally reassuring .turning regularly)	57 (52.8%)	39 (36.1%)	10 (9.3%)	1 (0.9%)	1 (0.9%)
Use of pharmacological agents	24 (22.2%)	58 (53.7%)	21 (19.4%)	4 (3.7%)	1 (0.9%)

52.8% of the nurses consistently comfort patients and 58% of them use pharmacological agents. Of the respondents1.9% of them consistently and 19.4% frequently switch off lights in the ICU.24.1% of the nurses frequently and 5% of the nurses consistently reduce noise in the ICU.

Table XII: Frequency of use of techniques in management of pain

Frequency of use of the following in the management of pain :-	Consistently n (%)	Frequently n (%)	Occasionally n (%)	Infrequently n (%)	Never n (%)
Explanation of Procedure to the patient	35 (32.4%)	35 (32.4%)	29 (26.9%)	8 (7.4%)	1 (0.9%)
Turning patient	58 (53.7%)	39 (36.1%)	10 (9.3 %)	1 (0.9%)	
Massaging patient	28 (25.9%)	40 (37%)	27 (25%)	9 (8.3%)	4 (3.7%)
Use of pharmacological agents	46 (42.6%)	54 (50%)	8 (7.4 %)		

In the management of pain 53.7% consistently turn the patient.32.4%, 25.9% and 42.6% consistently explain the procedure to the patient, massage the patient and use pharmacological agents respectively. Pharmacological agents are frequently used by 50% of the nurses.

31

DISCUSSION

This survey achieved a 90% response rate. This is much higher than similar studies and could be because the study questionnaire was administered by the investigator as compared to other studies where the questionnaire is mailed to the respondents with a stamped, addressed envelope for return of the questionnaire [5] [45]. The 10% non response was due to refusal to participate in the study by some of the study participants and non-availability of others as they were on their annual or study leave.

Knowledge about sedation and analgesia was very good, as assessed by the true-or-false questions in tables II-VI.75.94% of the respondents correctly answered most questions meant to assess current knowledge of sedation and analgesia management in the ICU .In the pharmacological management of sedation and analgesia less then 60% of the nurses knew that ketamine, fentanyl and remifentanil can be used for analgesia. Only 50.9% and 38% of the respondents knew that pethidine and haloperidol can be used for sedation respectively. The low correct response rate to some of the drugs could be due to their non-availability in the KNH-ICU hence the nurses are not familiar with the drugs and this may affect their knowledge on them. All nurses in this survey knew that over sedation may cause respiratory depression but less than 80% knew that bradycardia, ventilator induced pneumonia, paralytic ileus and venous stasis may be caused by over sedation. Although most nurses correctly answered the signs associated with under sedation only 67% knew that hypertension and 36% knew that hypoxia may be associated with under sedation. .Walker et al demonstrated that the nurse is the one who makes decisions at the bedside about the amount of sedative drugs to be administered to achieve an agreed target sedation level [41]. This survey concurs with their findings in that despite there not being a sedation guideline in use, nurses manage the dose and frequency of medications prescribed. Therefore it is important for them to have adequate knowledge on the drugs used and their effects.

Eighteen (15.7%) nurses in this survey have read the KNH-ICU/HDU protocol booklet and less than half of this number practice the sedation and analgesia guidelines according to the booklet. This is in keeping with similar studies in institutions where sedation protocols, though not nurse driven, are available but very few nurses have read or practice the sedation guidelines provided [21] [46]. The findings in this survey could be due to the fact that nurses do not know of or understand the sedation and analgesia guidelines or it is not a requirement for them to read and practice the guidelines in it. In addition it could

be that they do not support the sedation and analgesia protocols as they were probably not involved in their development. In studies [3] [40] done to assess response to a nursing-driven protocol for sedation and analgesia the nurses supported, read and implemented the protocol. This was attributed to the inclusion of nurses throughout the protocol design process and the fact that the protocols allowed them to use their clinical assessment skills while providing patient comfort.

In this survey, more than 50% of the respondents were satisfied with the current evaluation, adequacy, decision making and prescription by doctors of sedation and analgesia in the KNH ICU (Table VII). This is similar to studies [47] [48] in institutions where there are no formal sedation practices but the nurses were satisfied with the evaluation and practice This finding could also be due to the fact that there was no blinding during the study and the participants may have tended to focus on ideal practices and not give accurate information on actual practice. It could also be due to the use a protocol by physicians for decision making which though effective is not shared with the nurses hence they are unfamiliar with the guidelines. In addition, the fact that a doctor was the principal investigator could skew the results .This is in contrast to the results of earlier studies [21] [45] [46] where more than half the nurses were found to be dissatisfied with these parameters due to lack of consistency in the management of sedation and analgesia and the lack of formal sedation and analgesia guidelines.

80.6% of the nurses in this survey indicated that it was important to implement a standardized approach to sedation and analgesia.58.3% of the study participants indicated that a nursing implemented protocol was very important and that the nurse has a very important role in the assessment of sedation and analgesia as was indicated by 64.8% of the nurses. Protocols have been shown to be effective in achieving patient sedation goals and reduce inappropriate variations in clinical practice [3] [29] [40] .Staff perceptions on use of sedation and analgesia protocols as standardized methods of care are positive as they require constant assessment of patients' sedation level and analgesic needs and immediate intervention as opposed to not having a protocol which means the nurse has to communicate her assessment first ,obtain a prescription ,adjust the dose and wait for the drug to take effect. The use of protocols has been shown to decrease morbidity and duration of stay in ICU [1] [40] [41]. 41.7% of the nurses in this survey did not think it was very important to have a nurse implemented protocol. Similar studies [3] [29] [48] showed that nurses were not positive about nurse implemented protocols as they indicated that patients should be viewed as individuals with a need to deviate from set protocols and not everyone adhered to the guidelines . This resulted to variation in practice in the management of sedation and

analgesia. Where nurses were involved in the sedation and analgesia   protocol design there was improved implementation of the protocol as it gave them a sense of ownership [3 29 48] .

In the assessment of anxiety use of physiological and behavioural indicators were shown to be very important by a majority of the nurses (Tables IX and X) .This concurs with the findings of Frazier et al, where critical care nurses showed that patients verbalization of anxiety, physiological indicators and behavioural indicators were very important in assessing anxiety [22]. Physiological indicators included hyperventilation, increase in heart rate and blood pressure. The behavioural indicators found to be very important included restlessness, withdrawal, inattention or distraction of the patient. KNH ICU nurses rely on behavioural and physiological indicators in their clinical evaluations of anxiety as most patients are mechanically ventilated. Primary reliance on behavioural and physiological indicators may lead to underestimation of the extent of anxiety in vulnerable critical care patients because anxiety is a subjective phenomenon that precedes the development of most objectively detectable signs and behaviours [22]. The best indicator of anxiety is the patients' own reports of the experience [10 22]. However patient's self report varies depending on their own coping mechanism and there is a wide range of overtly expressed responses to the same stimulus and this could pose a challenge in the assessment of anxiety [22]. Most KNH-ICU patients are mechanically ventilated thus the nurses view on the significance of patient's self report may be an incorrect assessment of their capacity to assess levels of anxiety.

Whereas more than 60% of the respondents in this study stated that assessment of pain by physiological and behavioural parameters was very important only 49% felt that the patients self report was very important. This could be attributed to by the fact that most KNH ICU patients are mechanically ventilated hence the study participants do not encounter 'talking ' patients .According to the clinical practice guidelines for the sustained use of sedatives and analgesics in the critically ill patient the most reliable and valid indicator of pain is the patients' self report [10]. In selecting self-report measures of pain. it is essential to consider that cultural and language differences can also affect the patient's communication of pain [13]. Languages differ in the types and numbers of words used to express pain [13]. Changes in physiologic variables such as heart rate, blood pressure, respiration rate, perspiration and pupil size, are not unique responses to pain and may be caused by different stimulus to the body. This poses a challenge in objectively assessing pain in the critically ill patient who is mechanically ventilated. Puntillo et al demonstrated that patients' behaviour (facial expressions, body movements) and physiological (increased heart and rate, blood pressure) responses to pain have convergent validity with

34

nurses' ratings of their patients' pain intensity hence use of behavioural and physiological parameters may be used to assess pain [13]. Since behavioural and physiological indicators of pain were identified by the KNH ICU nurses as very important in the assessment of pain, they should be tested for reliability and variability so as to develop a standardized tool for pain assessment in the ICU.

Assessment of the factors frequently used to manage anxiety revealed that 57% of the nurses consistently comforted patients (verbally reassuring, turning them regularly) and 53.7% of them frequently used pharmacological agents. Occasionally, 50 % of them switched off lights and 47% of them reduced noise in the ICU. Earlier studies indicate that nurses use both pharmacological and non-pharmacological methods in the management of anxiety [5][20]. The most frequently used interventions were pharmacological: ensuring that pain relief is adequate and administering anti-anxiety drugs [20][49]. This is similar to the results of this study which showed that 53.7% of the KNH ICU nurses frequently used pharmacological methods in the management of anxiety. This is in keeping with the generally good knowledge by the study participants on pharmacological agents used for sedation.57% of the nurses consistently comforted patients (verbally reassuring, turning them regularly) as a method of managing anxiety .This is also similar to findings by Frazier et al where the frequently used non pharmacological interventions were to give reassurance about status and progress, give information, speak calmly and slowly, and use empathetic touch [20]. Most of the non pharmacological interventions used frequently by the respondents focused on providing information to reduce anxiety in patients. However, preference for information and an individual's predominant coping style are critical components of the response to information. Provision of too much or too specific information to a person who prefers less information may significantly increase anxiety [20].

Providing physical comfort and reducing environmental stressors (switching off lights, 50% and reducing noise, 47%) was another strategy used by the nurses to manage anxiety. Anxiety is commonly caused by adverse and or excessive physiological, psychological, and environmental stimuli and controlling environmental stressors such as noise from machines, alarms, and bright lights in the intensive care unit has been emphasized [20][49]. Providing physical comfort measures is a fundamental aspect of basic nursing practice that appears to be effective in managing mild to moderate anxiety, though it has not been formally tested in the management of anxiety [20]. Although there is paucity of data supporting the use of non pharmacological methods of anxiety management, massaging patients and

putting ear plugs was shown to reduce anxiety by promoting sleep and reducing noise respectively in some ICU's [50].

In the management of pain only 35% of the nurses consistently and 35% frequently explained the procedure to the patient. 53% of the ICU nurses consistently turned the patients regularly and 50% of them frequently used pharmacological agents to manage pain. Pharmacological management of pain has been shown to be frequently used compared to non pharmacological methods in similar studies. Non pharmacologic methods are used to compliment pain management in the ICU and are low cost, easy to provide and safe[12 51].Informing the patient about impending painful interventions should be standard practice [51]. For the cognitively intact ICU patient, the patient may be able to rehearse mentally before the procedure and may have more accurate expectations about the procedure, perhaps improving their ability to cope with discomfort [51].

In the management of anxiety, an average of 68% of the respondents who consistently reduced noise, switched off lights, comforted patients and used pharmacological agents, had attained a Higher Diploma in Critical Care. Of these, those who consistently reduced noise (*n = 3out of 5, 60%*), switched off lights (*n = 2 out of 2, 50%*), comforted patients (*n = 36 out of 57, 63.2%*) and used pharmacological agents (n = *18 out of 24, 75%)* had less than five years work experience in the ICU. Similarly in the management of pain it was shown that on average 80% of the respondents who consistently explained the procedure, turned, massaged patient and used pharmacological agents had a Higher Diploma in Critical Care. Further, most of these respondents who consistently explained the procedure (*n = 23 out of 35, 65.7%*), turned patient (*n= 36 out of 58, 62%*), massaged patient (*n = 19 out of 28, 67.8%*) and used pharmacological agents (*n = 30 out of 46, 65.2%*) were nurses who had practiced in the ICU for less than five years. Most existing literature shows that more experienced nurses are more confident, are more likely to provide better quality sedation by use of sedation and analgesia guidelines and are least likely to over-sedate their patients than less experienced nurses [21 41 48].This is in contrast to a study done by Fry et al which showed nurses with less experience adhered to and managed sedation guidelines according to a protocol in comparison with more experienced nurses. The lack of adherence by the more experienced nurses was attributed to change in sedation practice over the years from heavy sedation to light sedation and the fact that protocol use in ICU was a new concept which junior nurses were more receptive to probably due to exposure during their formal education [3].

Whereas 80% of respondents showed a good understanding of knowledge and attitude of analgesia and sedation management in the ICU, consistent practice levels were lower (less than 50%) (Tables II-VI, IX -XII).This could be due to the impact of daily work issues such as staffing which affect administration of these agents, communication difficulties, need to complete other nursing functions or lack of adequate work experience in the ICU. A study by Guttormson et al on factors influencing nurse sedation practices with mechanically ventilated patients demonstrated that the nurse to patient ratio and the need to complete other nursing functions had influenced sedation administration for about one-third of respondents in that survey [47]. In a national Swedish survey of intensive care sedation of mechanically ventilated patients, Samuelson et al showed that sedation practices were influenced by local habits, practices and personal habits [46]. Although most respondents preferred light sedation levels, heavy sedation was practiced in ICU's where heavy sedation was standard practice due to influence by local practices [46]. Weir et al showed that adherence and practice of sedation was affected by: reluctance by physicians to prescribe drugs and to acknowledge existing guidelines and lack of adequate nurse experience in the ICU which affected the nurses' confidence hence practice of sedation [48].

Conclusion

The nurses reported that assessment of sedation and analgesia by use of physiological, behavioral and physical parameters was very important.

The knowledge of analgesia and sedation management by the nurses in this survey is generally good and the areas of weaknesses identified could be due to lack of availability of the drugs hence knowledge on them is inadequate.

However there is a disconnect between the level of knowledge and attitude of sedation and analgesia management by the respondents with their practice in the CCU.

Most of the nurses have not read the sedation and analgesia guidelines in the ICU/HDU protocol booklet and most do not practice the analgesia and sedation guidelines in it.

The KNH CCU has no formal sedation and analgesia protocol used and the nurses indicated that it is very important to standardize the approach towards sedation and analgesia management and to have a nurse driven sedation and analgesia protocol.

Limitations of the study

Whereas this survey had 108 respondents which is small compared to similar studies, KNH has the largest number of ICU trained nurses in Kenya.

Questionnaire was administered by the principal investigator who is a doctor and this could have influenced the responses due to fear of intimidation. This was mitigated by adequate consent explanation and there were no subject identifiers during the collection and analysis of the data.

Recommendations

Studies should be conducted to assess the reason for the difference between the knowledge and attitude of sedation and analgesia by the nurses in comparison to their practices as this would help improve the standards of care to the patient.

There is a need to evaluate the relevance and adequacy of the KNH-ICU/HDU protocol booklet to the current practice or to conduct training or awareness on these protocols on a regular basis with a view to improve standards of care in the ICU.

There is a need to standardize approach to sedation and analgesia management by developing a protocol preferably a nurse driven protocol.

REFERENCES:

1. Feeley K, Gardner A. Sedation and analgesia management for mechanically ventilated adults: literature review, case study and recommendations for practice. *Aust Crit Care* 2006;19(2):73-7.

2. Shapiro BA. Practice parameters for critical care medicine: what are they and why do we need them? *Crit Care Med* 1995;23(9):1458-9.

3. Fry C, Edelman LS, Cochran A. Response to a Nursing-Driven Protocol for Sedation and Analgesia in a Burn-Trauma ICU. *J Burn Care Res* 2009;30(1):112-118.

4. Bion JF, Chow B, Bowden M. Aims and methods of assessment of sedation in ICU . *J Drug Development* 1991;4:19-25.

5. Moser DK, Chung ML, McKinley S, Riegel B, An K, Cherrington CC, et al. Critical care nursing practice regarding patient anxiety assessment and management. *Intensive and Critical Care Nursing* 2003;19:276-288.

6. Department R. Kenyatta National Hospital, 2009.

7. Sessler CN, Varney K. Patient focussed sedation and analgesia in the ICU. *Chest* 2008;133:552-565.

8. Marino PL. *The ICU Book*. third ed. 2007.

9. Westcott C. The sedation of patients in intensive care units: a nursing review. *Intensive Crit Care Nurs* 1995;11(1):26-31.

10. Jacobi J, Fraser GL, Coursin DB, Riker RR, Fontaine D, Wittbrodt ET, et al. Clinical practice guidelines for the sustained use of sedatives and analgesics in the critically ill adult. *Crit Care Med* 2002;30(1):119-41.

11. Young C, Knudsen N, Hilton A, Reves JG. Sedation in the intensive care unit. *Crit Care Med* 2000;28(3):854-66.

12. Erstad BL, Puntillo K, Gilbert HC, Grap MJ, Li D, Medina J, et al. Pain management principles in the critically ill. *Chest* 2009;135(4):1075-86.

13. Puntillo K, Pasero C, Li D, Mularski RA, Grap MJ, Erstad BL, et al. Evaluation of pain in ICU patients. *Chest* 2009;135(4):1069-74.

14. Monger E. Strategies for nursing conscious mechanically ventilated patients in Southampton and Amsterdam. *Intensive and Critical Care Nursing* 1995;11:140-147.

15. Kress JP, Pohlman AS, O'Connor MF, Hall J. Daily interruption of sedative infusions in critically ill patients undergoing mechanical ventilation. *N Engl J Med* 2000;342:1471-7.

16. Laing AS. The applicability of a new sedation scale for intensive care. *Intensive Crit Care Nurs* 1992;8(3):149-52.

17. De Jonghe B, Cook D, Appere-De-Vecchi C, Guyatt G, Maede M, Outin H. Using and understanding sedation scoring systems:a systemic review. *Intensive Care Medicine.* 2000;26(3):275-285.

18. Harvey MA. Managing agitation in critically ill patients. *Am J Crit Care* 1996;5(1):7-16; quiz 17-8.

19. Burchadi H. Aims of Sedation/Analgesia. *Minerva Anestesiol* 2004;70:137-43.

20. Frazier SK, Moser DK, Daley LK, McKinley S, Riegel B, Garvin BJ, et al. Critical care nurses' beliefs about and reported management of anxiety. *Am J Crit Care* 2003;12(1):19-27.

21. Egerod I, Christensen BV, Johansen L. Nurses' and Physicians' sedation practices in Danish ICUs in 2003.Anational survey. *Intensive and Critical Care Nursing* 2006;22:22-31.

22. Frazier SK, Moser DK, Riegel B, McKinley S, Blakely W, Kim KA, et al. Critical care nurses' assessment of patients' anxiety: reliance on physiological and behavioral parameters. *Am J Crit Care* 2002;11(1):57-64.

23. Merriman HM. The techniques used to sedate ventilated patients. A survey of methods used in 34 ICUs in Great Britain. *Intensive Care Med* 1981;7(5):217-24.

24. Bion JF, Ledingham IM. Sedation in intensive care-A postal survey. *Intensive Care Med* 1987;13:215-216.

25. Reeve W, Wallace P. A survey of sedation in intensive care. *Care of the criticaly ill* 1991;7(6):238-241.

26. Tonner PH, Weiler N, Paris A, Scholz J. Sedation and analgesia in the intensive care unit. *Curr Opin Anaesthesiol* 2003;16:113-121.

27. Ritz R. Benzodiazepines sedation in adult ICU patients . *Intensive Care Med* 1991;17:11-14.

28. Weinert CR, Chlan L, Gross C. Sedating critically ill patients:factors affecting nurses' delivery of sedative therapy. *American Journal of critical care* 2001;10(3):156-67.

29. Rose RL. Staff perceptions on the use of a sedation protocol in the intensive care setting. *Australian Critical care* 2004;17(4):151-159.

30. MacLaren R, Plamondon JM, Ramsay KB, Rocker GM, Patrick WD, Hall RI. A prospective evaluation of empiric versus protocol-based sedation and analgesia. *Pharmacotherapy* 2000;20(6):662-72.

31. De Jonghe B, Cook D, Griffith L, Appere-de-Vecchi C, Guyatt G, Theron V, et al. Adaptation to the Intensive Care Environment (ATICE): development and validation of a new sedation assessment instrument. *Crit Care Med* 2003;31(9):2344-54.

32. Ostermann ME, Keenan SP, Seiferling RA, Sibbald WJ. Sedation in the intensive care unit: a systematic review. *Jama* 2000;283(11):1451-9.

33. Hammill-Ruth RJ MM. Evaluation of pain in the critically ill patient. *Crit Care Clin* 1999(15):35-54.

34. Ho K, Spence J, Murphy MF. Review of pain management tools. *Ann Emerg Med* 1996;27:427-432.

35. Hall-Lord ML, Larsson G, Steen B. Pain and distress among elderly intensive care unit patients:Comparison of patients' experinces and nurses assessments. *Hear Lung Journal* 1998;27:123-132.

36. Puntillo K, Miaskowski C, Kehrle K. Relationship between behavioral and physiological indicators of pain,and opioid administration. *Crit Care Med* 1997;25:1159-1166.

37. Chanques G, Jaber S, Barbotte E, Violet S, Sebbane M, Perrigault P-F, et al. Impact of systematic evaluation of pain and agitation in an intensive care unit. *Crit Care Med* 2006;34(6).

38. Mehta S, Maede MO, Hynes P, Filate WO, Burry L, Hallett D, et al. A multicenter survey of Ontario intensive care unit nurses regarding the use of sedatives and analgesics for adults receiving mechanical ventilation. *J Critical Care* 2007;22:191-196.

39. Brook AD, Ahrens TS, Schaiff R, Prentice D, Sherman G, Shannon W, et al. Effect of a nursing-implementedsedation protocol on the duration of mechanical ventilation. *Crit Care Med* 1999; 27(12):2609-2615.

40. Alexander E, Carnevale FA, Razack S. Evaluation of a sedation protocol for intubated critically ill children. *Intensive and critical care nursing* 2002;18:292-301.

41. Walker N, Gillen P. Investigating nurses' perceptions of their role in managing sedation in intensive *Intensive and Critical Care Nursing* 2006;22:338-345.

42. Slomka J, Hoffman-Hog L, Mion LC, Bair N, Bobek MB, Arroliga A. Influence of clinician's values and perceptions on use of clinical pracice guidelines for sedation. *American Journal of critical care* 2000;9(6):412.

43. Murray K. The need for assessment of sedation in the critically ill. *Nursing Critical Care* 1997;2(6):297-302.

44. Committee KNH-ICU. *KNH-ICU/HDU Protocols Booklet*, 2004.

45. Mehta S, Burry L, Martinez-Motta JC, Stewart TE, Hallet D, McDonald E, et al. A randomized trial of awakening in critically ill patients managed with a sudden protocol: A pilot trial. *Crit Care Med* 2008;36.

46. Samuelson KA, Larsson S, Lundberg D, Fridlund B. Intensive care sedation of mechanically ventilated patients: a national Swedish survey. *Intensive and Critical Care Nursing* 2003;19:350-362.

47. Guttormson JL, Chlan L, Weinert C, Savik K. Factors influencing nurse sedation practices with mechanically ventilated patients: a U.S. national survey. *Intensive Crit Care Nurs* 2010;26(1):44-50.

48. Weir S, O'Neill A. Experiences of intensive care nurses assessing sedation/agitation in critically ill patients. *Nurs Crit Care* 2008;13(4):185-94.

49. Pun BT, Ely EW. The imporance of diagnosing and managing ICU delirium. *Chest* 2007;132:624-636.

50. Pun BT, Dunn J. The sedation of critically ill adults: part 2: management. *Am J Nurs* 2007;107(8):40-9; quiz 50.

51. Coyer FM, Wheeler MK, Wetzig SM, Couchman BA. Nursing care of the mechanically ventilated patient: What does the evidence say? *Intensive and Critical Care Nursing* 2007;23:71-80.

APPENDIX I

QUESTIONNAIRE

Section One-Demographic Information

1 Serial No.................

2 Age of participant in years ....

3 Years of practice as a nurse   0-5   6-10   11-15   16-20   21 years and over

4 Years of practice as an intensive care unit nurse

  0-5   6-10   11-15   16-20   21 years and over

5 Highest level of education

  PhD   Masters   BScN   Higher Diploma-Critical Care

  Higher Diploma (others)   Diploma   Hospital Certificate/Registration

Section Two – Place a tick (v) by the correct answer

	Strongly Satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Strongly Dissatisfied
6 How would you rate your satisfaction with the ICU sedation and analgesia:					
a) Evaluation	1	2	3	4	5
b) Adequacy	1	2	3	4	5
b) Decision making	1	2	3	4	5
c) Prescription by Doctors	1	2	3	4	5

43

	Very Important	Important	Neither Important nor Unimportant	Not important	Very Unimportant
7 Regarding sedation and analgesia in the ICU, how would you rate the importance of :					
a) Implementation of a standardized approach?	1	2	3	4	5
b) A nursing implemented protocol?	1	2	3	4	5
c) The nurse in its assessment?	1	2	3	4	5
8 How important are the following in assessing sedation?					
a) General appearance	1	2	3	4	5
b) Patient's response to commands/stimuli	1	2	3	4	5
c) Breathing pattern	1	2	3	4	5
d) Heart rate/pulse rate	1	2	3	4	5
9 How important are the following in assessing pain?					
a) Facial expressions	1	2	3	4	5
b) Verbal response	1	2	3	4	5
c) Heart rate/pulse rate	1	2	3	4	5
d) Breathing rate	1	2	3	4	5
e) Blood pressure	1	2	3	4	5

	Consistently	Frequently	Occasionally	Infrequently	Never
10 How frequently do you use the following in the management of anxiety :-					
a)Reducing noise in the ICU	1	2	3	4	5
b)Switching off lights	1	2	3	4	5
c)Comforting patient(verbally reassuring ,turning regularly)	1	2	3	4	5
d) Use of pharmacological agents	1	2	3	4	5
11 How frequently do you use the following in the management of pain :-					
a) Explanation of Procedure to the patient	1	2	3	4	5
b)Turning patient	1	2	3	4	5
c) Massaging patient	1	2	3	4	5
d)Use of pharmacologic agents	1	2	3	4	5

Section Three-Yes and No -Circle the one which you consider is the correct statement

	Yes	No	Not Sure
12 In reference to the KNH-ICU/HDU booklet:-			
a) Have you read the sedation and analgesia guidelines in it?	1	2	3

If answer to 15a is Yes proceed to 15b.If answer is No or Not sure proceed to Question 16

b) Do you find the sedation and analgesia guidelines in it adequate?	1	2	3
c) Do you practice the sedation and analgesia guidelines according to the booklet?	1	2	3

Section Four-True and False-Circle the one which you consider is the correct statement

	True	False	Not Sure
13 It is possible to treat pain without treating anxiety?	1	2	3
14 Patients not adequately treated for pain and anxiety may suffer complications such as ICU psychoses	1	2	3
15 Analgesics may decrease the amount of anxiety in a patient	1	2	3
16 A sedation/analgesia protocol allows us to evaluate the effectiveness of our sedation and analgesia	1	2	3
17 The following drugs can be used for analgesia in the ICU			
a) Paracetamol	1	2	3
b) Diclofenac	1	2	3
c) Pethidine	1	2	3
d) Morphine			
e) Tramadol	1	2	3
f) Fentanyl	1	2	3
g) Remifentanil	1	2	3
h) Midazolam	1	2	3
i) Diazepam	1	2	3
j) Ketamine	1	2	3
k) Propofol	1	2	3
l) Haloperidol	1	2	3
18 The following drugs can be used for sedation in the ICU- a) Paracetamol	1	2	3
b) Diclofenac	1	2	3
c) Pethidine	1	2	3

	True	False	Not Sure
d) Morphine	1	2	3
e) Tramadol	1	2	3
f) Fentanyl	1	2	3
g) Remifentanil	1	2	3
h) Midazolam	1	2	3
i) Diazepam	1	2	3
j) Ketamine	1	2	3
k) Propofol	1	2	3
l) Haloperidol	1	2	3

19 The following are associated with over-sedation in the ICU patient :-

a) Prolonged ventilation times	1	2	3
b) Respiratory depression	1	2	3
c)Bradycardia	1	2	3
d) Ventilator induced pneumonia	1	2	3
e) Paralytic ileus	1	2	3
f) Venous Stasis	1	2	3

20 The following are associated with under sedation in the ICU patient:-

a) Tachycardia	1	2	3
b) Hypertension	1	2	3
c) Agitation	1	2	3
d) Ventilator-patient dysynchrony	1	2	3
e) Hypoxia	1	2	3

	True	False	Not Sure
21 Uncontrolled pain may have the following effects in the ICU patient:-			
a) Tachypnoea	1	2	3
b) Hypertension	1	2	3
c) Tachycardia	1	2	3
d) Hyperglycaemia	1	2	3
e) Exhaustion	1	2	3
f) Disorientation	1	2	3

APPENDIX II

CONSENT EXPLANATION

My name is Caroline Mwangi (Dr), a post graduate student in anaesthesia at the University of Nairobi. As part of my course work, I am required to perform clinical research.

I am conducting a survey on the knowledge, attitude and practice of sedation and analgesia amongst nurses working in the Intensive Care Unit of Kenyatta National Hospital.

The aim of the study is to study our practice, knowledge and attitude of sedation and analgesia, and identify our strengths and weaknesses. This will help improve the quality of sedation and analgesia given to patients in the intensive care unit and also to compare with international standards.

To do this I shall obtain information in form of a questionnaire administered to you. The results obtained will enable us come up with recommendations. Therefore, I shall need your consent as the participant in order to be included in the study.

This is a voluntary exercise and no victimization will occur on the basis of refusal to participate in the study. One can withdraw from the study at any point in time. Any information obtained in the course of the study is beneficial to the management of the patient. All information shall be treated with utmost confidentiality.

UFAFANUZI WA MAKUBALIANO

Jina langu ni Daktari Caroline Mwangi ,mwanafunzi katika kitivo cha utabibu,Chuo Kikuu cha Nairobi.Sehemu ya masomo yangu yanilazimu kufanyautafiti.

Nitafanya utafiti kuhusu uelewaji wa kupeana dawa za uchungu na kutuliza moyo kwa wauguzi wanaohudumu katika chumba cha wagonjwa mahututi,hospitali ya kitaifa ya Kenyatta .

Madhumuni ya utafiti huu ni kujua ujuzi na uelewaji wa dawa hizi ili tutambue unyonge wetu .Hii itasaidia kuimarisha ujuzi wetu kulinganisha na maendekezo ya kimataifa.

Ningependa kupata ujumbe huu kwa njia ya karatasi inayokuwa na maswali .Majibu mtakayonipa yatanisaidia kuleta mapendekezo.Kwa hivyo ningependa kukuomba uwemhusika katika utafiti huu kwa hiari yako.Hakuna kulazimishwa na unaweza kupotoka wakati wowote unapokuwa na tashwishwi.
Ujumbe wote utakao patikana katika utafiti huu utaboresha uuguzaji wa wagonjwa

APPENDIX III

INFORMED CONSENT FORM

I have understood the explanation by Dr C.M. Mwangi and hereby give informed consent to participate in the study:

1   I accept to participate in the study.
2   I accept to be interviewed concerning knowledge, attitudes and practices of sedation and analgesia amongst nurses working in the Kenyatta National Hospital, Intensive Care Unit.
3   I understand that the information I give will be treated with utmost confidence.
4   I understand that my participation in the study is voluntary and I can withdraw my consent at any point of study and that such withdrawal will not affect my work in any way.

Participant's Name   Signature

....

Investigator   Signature

....

FOMU YA IDHINI YA KUSHIRIKI

Nimeelewa maelezo yote kutoka kwa daktari C.M. Mwangi na ninatoa kibali kuhusishwa kwenye utafiti:

1   Kwa hiari yangu binafsi.
2   Nakubali kutoa habari kuhusu uelewaji wa kupeana dawa za uchungu na kutuliza moyo kwa wauguzi wanaohudumu katika chumba cha wagonjwa mahututi , hospitali ya kitaifa ya Kenyatta.
3   Nimeelewa kwamba kuhusishwa kwangu ni kwa hiari yangu na naweza kujiondoa wakati wowote bila masharti na kujiondoa kwangu hakutadhuru kazi yangu kwa njia yeyote.
4   Nimeelewa ya kwamba habari yoyote nitakayoitoa itahifadhiwa kwa siri.

Jina la Mhusika   Sahihi

....

Jina la Mtafiti   Sahihi

....

APPENDIX IV

STUDY TIMETABLE

	July 09	Aug 09	Sept 09	Oct 09	Nov 09	Dec 09	Jan 10	Feb 10	Mar 10	Apr 10	May 10	June 10
Proposal development	v	v	v	v	v							
Proposal presentation						v						
Data collection							v	v				
Data analysis									v			
Dissertation Writing										v	v	
Dissertation presentation												v

STUDY BUDGET ESTIMATES

Item	Quantity	Cost (KShs)
Biostatistician	-	20,000
Research Assistant	-	7,000
Ethics and Research committee	-	1,000
Paper	4 reams	5,000
Storage devices (Compact discs/Flash drives)	2 each	2,000
Printing	-	2,500
Photocopying	-	2,500
Writing material (pens and pencils)	-	1.500
Grand Total		**41,500**

APPENDIX VI

ETHICS & RESEARCH COMMITTEE APPROVAL LETTER

KENYATTA NATIONAL HOSPITAL
Hospital Rd. along, Ngong Rd.
P.O. Box 20723, Nairobi.
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP", Nairobi.
Email: KNHplan@Ken.Healthnet.org

Ref: KNH-ERC/ A/385

25th January 2010

Dr Caroline M. Mwangi
Dept.of Surgery
School of Medicine
University of Nairobi

Dear Dr. Mwangi

RESEARCH PROPOSAL: "A SURVEY OF KNOWLEDGE, ATTITUDE AND PRACTICES OF SEDATION AND ANALGESIA AMONGST NURSES WORKING IN THE KENYATTA NATIONAL HOSPITAL. INTENSIVE CARE UNIT"   (P322/11/2009)

This is to inform you that the KNH/UON-Ethics & Research Committee has reviewed and **approved** your above cited research proposal for the period 25th January 2010 – 24th January, 2011.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimens must also be obtained from KNH/UON-Ethics & Research Committee for each batch.

On behalf of the Committee, I wish you a fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of the data base that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely

DR. L. MUCHIRI
AG. SECRETARY, KNH/UON-ERC
c.c.   Prof. K. M. Bhatt, Chairperson, KNH/UON-ERC
         The Deputy Director CS, KNH
         The Dean, School of Medicine, UON
         The Chairman, Dept.of Surgery (Anaesthesia), UON
         The HOD, Records, KNH
         Supervisors: Dr. Mark Gacii, Dept.of Surgery, UON
                  Dr Charles E. Kabetu, Dept.of Anaesthesia, KNH & Deputy Director CS(KNH)