

**MATERNAL SATISFACTION WITH SPINAL ANAESTHESIA FOR
CAESAREAN DELIVERY AT KENYATTA NATIONAL HOSPITAL**

**A DISSERTATION PRESENTED IN PART FULFILLMENT OF THE
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MATERNAL SATISFACTION WITH SPINAL ANAESTHESIA FOR CAESAREAN DELIVERY AT KENYATTA NATIONAL HOSPITAL

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DECLARATION

I declare that this dissertation is my original work and has not been submitted for a degree award in any university.

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DEDICATION

To Geoffrey William Griffin, a true source of inspiration and a fountain of hope. You taught me the meaning of sacrifice and showed me the path of duty. I am forever indebted to you in gratitude.

May God Almighty rest your soul in eternal peace.

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List of abbreviations

1. CS.....Caesarean Section
2. CSEA..... Combined Spinal Epidural Anaesthesia
3. ERC.....Ethics and Research Committee
4. KNH.....Kenyatta National Hospital
5. NRFS.....Non Reassuring Fetal Status
6. TNS.....Transient Neurological Symptoms
7. VBAC.....Vaginal birth after caesarean delivery
8. WHO.....World Health Organisation

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1.0: ABSTRACT

Background: The fulfillment of expectations, abolition of pain and communication are the most important determinants of the postpartum evaluation of childbirth after caesarean delivery.

This study aimed to determine the level of maternal satisfaction with pain control, the care received, and the communication and explanations given for patients undergoing spinal anaesthesia for caesarean delivery.

Methodology: The study was designed as a cross-sectional survey. It was carried out in the Kenyatta National Hospital postnatal wards. Data was captured electronically using SPSS and analysis done using SPSS version 17. Univariate analysis was used to extract simple frequencies and the data was presented graphically. A five-point likert scale was used to measure maternal satisfaction and various inferential statistics were used to assess association.

Results: A total of 346 post caesarean delivery women were interviewed. The satisfaction with pain control was 89.5%. 92.2% of the women were satisfied with their involvement in decision making while 94.8% were satisfied with the level of communication with their anaesthesia providers. 95.1% of the women had their expectations for delivery met.

The satisfaction with the choice of spinal anaesthesia for caesarean delivery was 80%. The overall satisfaction with childbirth was 95.3%.

Conclusion: Neonatal outcome was a strong predictor of satisfaction. Those who experienced a poor neonatal outcome were 6.8 times more likely to be dissatisfied. The cadre of anaesthetist, marital status of parturient and number of prior caesarean deliveries had no influence on maternal satisfaction.

2.0: INTRODUCTION

Access to healthcare is a fundamental and inalienable right. Chapter four of the Bill of Rights of the Kenya Constitution states in Article 43(1a) that *every person has the right to the highest attainable standard of health, which includes the right to health care services, including reproductive health care*, and in Article 43(2), that *a person shall not be denied emergency medical treatment*.¹

Hospitals have a mandate to continuously improve their healthcare service delivery. Various endpoints have been used in the past for monitoring improvements in service delivery. Smith and colleagues, for example, have proposed a '4 corner value compass' to guide quality of healthcare data collection.² The 'compass corners' represent the 4 types of data needed to meet healthcare customer expectations and are:-

- I. Patient satisfaction
- II. Improved functional status
- III. Appropriate clinical outcomes
- IV. Appropriate costs

2.1: Patient satisfaction

Patient satisfaction is defined as a positive evaluation of the hospital experience. It has several short and long term effects on the functional outcome of patients. Dissatisfaction with childbirth can lead to sexual dysfunction, aversion to further pregnancy and birth and increase in complaints and litigation.³

The Institute for Healthcare Improvement (IHI), in its *innovation series white paper*, identified patient satisfaction as one of the four key components of the safest and most reliable systems of perinatal care. Higher patient satisfaction scores were seen to be associated with better outcomes and reduction in mortality.⁴ Patient satisfaction is frequently used to evaluate the standards of service delivery in hospitals.

2.2: Improved functional status

Functional status describes the capacity to undertake a wide range of tasks of daily living. Patients visit healthcare facilities with the expectation that their functional status will be improved. It has been shown that hospitals with higher staff to patient ratio and lower staff turnover have higher degrees of functional improvement in patients.⁵

2.3: Appropriate clinical outcomes

Australia's New South Wales Health Department defines clinical outcome as "a change in the health of an individual, group of people or population which is attributable to an intervention or series of interventions."⁶ Measurement of health outcomes implies measuring health status before an intervention is carried out, measuring the intervention, measuring health status again and then relating the change to the intervention. Ensuring an appropriate clinical outcome is one of the most important roles of a medical practitioner. Failure to regularly achieve appropriate clinical outcomes may be a sign of poor service delivery in a hospital.

2.4: Appropriate costs

Prohibitive costs of healthcare may hinder patients from accessing appropriate healthcare services. The costs incurred by a hospital in provision of healthcare should be justifiable. Cost cutting measures should be implemented without reducing the quality of care. Health economics is a relatively new field that tries to find the best way to satisfy the ever increasing demand for health care given the limited resources. Health economics helps policy makers, health care providers, and insurance companies to determine ways of reducing healthcare costs.⁷

3.0: LITERATURE REVIEW

3.1: AN OVERVIEW OF CAESAREAN DELIVERY

3.1.1: DEFINITION OF CAESAREAN DELIVERY

Caesarean delivery, also known as caesarean section, is a surgical procedure used to deliver a baby through an incision in the mother's abdomen and a second incision in the mother's uterus.⁸

3.1.2: Historical background

The origin of the term caesarean remains obscure. According to legend, Julius Caesar was born in this manner. The mother of Caesar, known as Aurelia, however lived for many years after his birth in 100 B.C., and since the operation was almost invariably fatal before the 17th century, this explanation is likely to be untrue. The term Caesarean more likely refers to being cut open as the latin verb 'caedere' means to cut.⁹

In 1598, Guillimeau introduced the term 'caesarean section'. Before this, the operation was referred to as Caesarean Operation. In the later part of the 19th century, the operation began to be established as part of obstetric practice, mostly due to refinements in anaesthetic technique. Mortality still remained high with sepsis and peritonitis as leading causes of post-operative deaths.

The introduction of Penicillin in 1940 dramatically reduced the risk of infection associated with childbirth. This in turn paved the way for almost universal acceptance of caesarean delivery as a suitable and safe obstetric practice.

3.1.3: Current trends in caesarean delivery rates

The caesarean delivery rate refers to the proportion of women undergoing caesarean delivery of all women giving birth during a specific time period.

The caesarean birth rate in Kenya is approximately 6% of all deliveries.¹⁰ This is in sharp contrast to more developed countries in Europe, Asia and America where much higher rates have been recorded. In the USA for example, the caesarean delivery rate accounts for 31% of all deliveries and is the

commonest major surgical procedure undertaken there today.¹¹In the same country in 1960, the caesarean delivery rate was less than 5%. The sharp increase seen is mostly due to a rise in primary caesarean deliveries for dystocia, fetal distress, little enthusiasm for Vaginal Birth after Caesarean delivery (VBAC) and fear of litigation. In particular the use of electronic fetal heart rate monitoring in diagnosis of fetal distress is widespread in The USA thus increasing the caesarean delivery rate.¹²This is despite the fact that it has not been shown reduce the risk of metabolic acidosis, birth asphyxia or cerebral palsy compared with intermittent auscultation.¹³

China has the highest caesarean section (CS) rate in the world at 46%; while the rate in Asia is 27%, Latin America 35% and Africa 9%.¹¹ The World Health Organization (WHO) believes that many of these caesarean sections in countries outside Africa are unnecessary. In its 2010 world health report, the WHO concluded that “worldwide, cesarean deliveries that are possibly medically unnecessary appear to command a disproportionate share of global economic resources. Cesarean sections arguably function as a barrier to universal coverage with necessary health services. Excess Cesarean sections can therefore have important negative implications for health equity both within and across countries.”¹¹

According to Althabe & Belizan, there is no justification for any region to have CS rates higher than 15%.¹² In their study done in 2006, they found there was no improvement in maternal or neonatal mortality in countries where caesarean section rates were greater than 15%.

3.1.4: Indications for caesarean delivery

Indications for caesarean delivery may be broadly classified into 3 groups:-

- Maternal indications
- Fetal indications
- Combined Maternal-fetal indications

3.1.4.1: Maternal indications

Maternal indications for caesarean delivery include the following:^{13,14}

- Repeat caesarean delivery

- Obstructive lesions in the lower genital tract, including malignancies, large vulvovaginal condylomas, obstructive vaginal septa, and leiomyomas of the lower uterine segment that interfere with engagement of the fetal head
- Pelvic abnormalities that preclude engagement or interfere with descent of the fetal presentation in labor
- Conditions in which the increasing intrathoracic pressure generated by Valsalva maneuver could lead to maternal complications. These include left heart valvular stenosis, dilated aortic valve root, certain cerebral arteriovenous malformations (AVMs), and recent retinal detachment.¹⁴
- Women who have previously undergone vaginal or perineal reparative surgery (eg, colporrhaphy or repair of major anal involvement from inflammatory bowel disease) also benefit from caesarean delivery to avoid damage to the previous surgical repair.
- Elective caesarean delivery on maternal request

3.1.4.2: Fetal indications

Fetal indications for caesarean delivery include the following:

- Situations in which neonatal morbidity and mortality could be decreased by the prevention of trauma e.g. non vertex presentation, cord prolapse, head entrapment.¹⁵
- Malpresentations e.g. breech presentation.¹⁶
- Certain congenital malformations or skeletal disorders such as fetal neural tube defects, hydrocephalus with enlarged biparietal diameter and osteogenesis imperfecta.¹⁷
- Infection such as maternal HIV-AIDS and active or symptomatic genital herpes.¹⁸
- Prolonged fetal acidemia¹⁹

3.1.4.3: Combined maternal & fetal indications

Indications for caesarean delivery that benefit both the mother and the fetus include the following:

- Abnormal placentation such as placenta previa.²⁰
- Abnormal labor due to cephalopelvic disproportion²¹
- Situations in which labor is contraindicated. This group includes women who have a uterine scar (prior transmural myomectomy or cesarean delivery by high vertical incision). A cesarean delivery should be performed prior to the onset of labor to prevent the risk of uterine rupture.²²

3.2: Anaesthesia for caesarean deliveries

With all caesarean sections, it is vital that the obstetrician clearly communicates the degree of urgency to all staff. Caesarean sections can be classified depending on degree of urgency into:-

- **Immediate caesarean section:** There is immediate threat to the life of the mother or the fetus.
- **Urgent caesarean section:** There is maternal or fetal compromise that is not immediately life threatening.
- **Elective caesarean section:** Delivery is timed to suit the mother and staff.

Anaesthesia for caesarean deliveries may be conducted either through regional or general anaesthesia.

3.2.1: Regional anaesthesia

Regional anaesthesia for caesarean delivery involves the injection of local anaesthetic solution with or without adjuvants into either the epidural space (Epidural Anaesthesia), the subarachnoid space (Spinal Anaesthesia) or both (Combined Spinal Epidural Anaesthesia) to provide a pain-free operating field. Caesarean section is then done on a patient who is awake, pain free and able to communicate freely with theater room staff while participating in the birthing experience.

3.2.1.1: Spinal anaesthesia

Bupivacaine is the most commonly used local anaesthetic for spinal anaesthesia. Its S-enantiomer levobupivacaine is also widely used. Lidocaine has been used in the past but its use is no longer recommended due to the risks of cauda equina syndrome and transient neurological symptoms (TNS).²³

To improve the spinal anesthetic efficacy, adjuvants from different pharmacological classes of drugs are used to enhance and prolong analgesia, to lower dose requirements, and to reduce dose-dependent side effects. Opioids have attained an integral role as a spinal anesthetic adjuvant. They are often administered in combination with local anesthetics to enhance pain relief.²⁴

Benefits of spinal anaesthesia include:-²⁵

- Easy to perform
- Reliable
- Provides excellent operating conditions for the surgeon
- Less costly compared to general anesthesia
- Normal gastrointestinal function returns faster with spinal anesthesia compared to general anesthesia
- Patient maintains a patent airway
- A decrease in pulmonary complications compared to general anesthesia
- Decreased incidence of deep vein thrombosis and pulmonary emboli formation compared to general anesthesia
- It is an excellent technique to use in the elderly patient that may not tolerate a general anaesthetic.

Disadvantages include the following: ²⁶

- Risk of failure even in skilled hands. One should always be prepared to induce general anesthesia.

- Alteration in the patient's hemodynamics with risk of severe hypotension. It is essential to place the spinal block in the operating room, while monitoring the patient's ECG, blood pressure, and pulse oximetry. Resuscitation medications should be available.
- The operation could outlast the spinal anesthetic. Alternative plans (i.e. general anesthesia) should be prepared in advance.
- Risk of complications such as post dural puncture headache and systemic toxicity from the local anaesthetic.

3.2.2: General anaesthesia

General anaesthesia is the induction of a state of unconsciousness with the absence of pain sensation over the entire body. It is the state produced when a patient receives medications for amnesia, analgesia, muscle paralysis, and sedation. An anaesthetized patient can be thought of as being in a controlled, reversible state of unconsciousness.²⁷

General anaesthesia enables a patient to tolerate surgical procedures that would otherwise inflict unbearable pain, potentiate extreme physiologic exacerbations, and result in unpleasant memories. General anesthesia uses intravenous and inhaled agents to allow adequate surgical access to the operative site.²⁸

General anaesthesia involves the processes of induction, maintenance, and emergence from anaesthesia.

Induction is the transformation of an awake patient into an anaesthetized one. It can be achieved by intravenous injection of induction agents (drugs that work rapidly, such as propofol and thiopental), by the slower inhalation of anesthetic vapors delivered into a face mask, or by a combination of both. In addition to the induction drug, most patients receive an injection of an opioid analgesic. Induction agents and opioids work synergistically to induce anaesthesia and to minimise the hypertensive response to intubation.²⁸

The next step of the induction process is securing the airway. This may be a simple matter of manually holding the patient's jaw such that his or her natural breathing is unimpeded by the tongue, or it may

demand the insertion of a prosthetic airway device such as a laryngeal mask airway or endotracheal tube.

Airway reflexes (e.g. gagging, coughing) in an unconscious patient are usually absent thus there is a risk of aspiration of gastric contents into the airway during general anaesthesia. This risk is higher in pregnant patients because the enlarged uterus displaces the stomach upwards. This risk of aspiration is considerably reduced by placement of an endotracheal tube.²⁹

For surgery of the abdomen or thorax, an intermediate or long-acting muscle relaxant drug is administered in addition to the induction agent and opioid. This paralyzes muscles indiscriminately, including the muscles of breathing. Therefore, the patient's lungs must be ventilated under pressure.³⁰

Maintenance of anaesthesia for the most part refers to the delivery of anaesthetic gases (more properly termed *vapors*) into the patient's lungs. These may be inhaled as the patient breathes spontaneously or delivered under pressure by each mechanical breath of a ventilator.

During emergence, anaesthetic vapors are switched off and excess muscle relaxation reversed. When the patient regains sufficient control of his or her airway reflexes, any artificial airway devices are removed.

Benefits of general anaesthesia include:-^{31,34,35,37,38}

- Reduced intraoperative patient awareness and recall
- Allows for proper muscle relaxation for prolonged periods of time
- Facilitates complete control of the airway, breathing, and circulation
- Can be used in cases of sensitivity to local anesthetic agent
- Can be administered without moving the patient from the supine position
- Can be adapted easily to procedures of unpredictable duration or extent
- Can be administered rapidly and is reversible

Disadvantages^{31,32,34,35,39}

- Requires increased complexity of care and associated costs

- Requires careful preoperative patient preparation
- Associated with complications such as nausea or vomiting, sore throat, headache, shivering, and delayed return to normal mental functioning
- Associated with malignant hyperthermia, a rare, inherited muscular condition in which exposure to some general anesthetic agents results in acute and potentially lethal temperature rise, hypercarbia, metabolic acidosis, and hyperkalemia

3.3: Considerations in the choice of anesthetic technique

Regional anaesthesia is increasingly being accepted the world over as the anaesthetic management of choice for caesarean delivery.⁴⁰⁻⁴³ This is because compared to general anaesthesia, regional anaesthesia has the advantages of decreased risk of aspiration, avoidance of depressant drugs, ability of the mother to remain awake and enjoy the birthing experience, and most importantly, decreased need for tracheal intubation.⁴⁴

Additionally, the available evidence suggests that intra-operative blood loss is reduced during regional anaesthesia.³¹ The case fatality rate for regional anaesthesia is reduced by a magnitude of **16.7** when compared to general anaesthesia.³² Regional anaesthesia is avoided in patients with a bleeding disorder because of the risk of bleeding into the spinal canal during injection of the anesthetic. Bleeding into the spinal canal is potentially catastrophic as it may result in compression of the spinal cord resulting in irreversible neurological deficits such as paraplegia.

Compared to general anaesthesia, regional anaesthesia causes a greater reduction in blood pressure. This may be beneficial in patients with hypertension, but regional anaesthesia should generally be avoided in hypotensive patients.

General anaesthesia has the advantages of faster onset of anaesthesia, total protection of the airway after placement of the endotracheal tube and superior control of blood pressure. It is therefore preferred in the management of maternal hemorrhage, life threatening fetal compromise, reduced consciousness, bleeding tendency, localized infection at the injection site, chorioamnionitis, or cases where a mother rejects spinal anaesthesia.

Potential problems associated with general anaesthesia for caesarean delivery include failed intubation, pulmonary aspiration, maternal awareness and neonatal depression.³²⁻³⁶ Inability to intubate the trachea is commoner in pregnant patients,^{37,38} and is the leading cause of maternal deaths related to anaesthesia.³⁹

3.4: Maternal preference for anaesthetic technique

A study done in Greece to compare maternal preference of anesthetic technique found that recovery from surgery was much faster after spinal anaesthesia compared to general anaesthesia. Spinal anaesthesia was also associated with less pain, fewer days of hospital stay and higher satisfaction scores compared to general anaesthesia. 80% of the women interviewed said they would choose spinal anaesthesia for a future caesarean section.⁴⁵

A similar study carried out on antenatal mothers in Nigeria revealed most respondents preferred general anaesthesia and the commonest reason for the preference was various forms of fear about the conduct of anaesthesia.⁴⁶

Maternal preference for anaesthetic technique may be influenced by various factors such as age, occupation, culture, religion, socio-economic status and level of education.⁴⁷ While satisfaction after spinal anaesthesia is usually higher compared to general anaesthesia, this does not necessarily translate to greater maternal preference for spinal anaesthesia.⁴⁸

3.5: Determinants of maternal satisfaction during caesarean delivery

Despite considerable research, satisfaction is still poorly defined.⁴⁹ It is a multi-dimensional concept influenced by a variety of factors.⁵⁰ This means that women can be satisfied with some aspects of childbirth and dissatisfied with others.⁵¹ Porter and colleagues found that patients undergoing caesarean delivery find the most distressing factors, and by extension the factors most likely to influence their satisfaction, are of a psychological or general nature such as poor communication, fears, missing out on the birth or immediate postpartum period.^{51,52}

Hodnett and colleagues found that factors traditionally thought to greatly influence satisfaction such as pain relief and intrapartum medical interventions were neither as obvious, nor as powerful as the psychological factors.⁵¹

Lavender and colleagues conducted a study to determine what aspects of childbirth experience women perceived as being crucial. They found that spouse's support, emotional control, pain relief and involvement in decision making were among the most important factors.⁵³

Pain control, competence of the anaesthesia provider, quality of care received, maternal involvement in decision making and communication are important factors that determine the parturient's satisfaction with anaesthesia for caesarean delivery.

3.5.1: Post-operative pain

Post-operative pain is highly variable between individuals and is influenced by multiple factors, including sensitivity to pain, psychological factors, age and genetics.⁵⁴

Despite advances in postoperative pain management, postoperative pain relief and satisfaction are still inadequate in some patients because of individual variability and limitation from side effects of analgesic drugs or techniques. Results from a study in the USA suggest that a patient has a 50 to 71% chance of experiencing moderate to severe pain after surgery.⁵⁵

Caesarean delivery patients have even more compelling reasons to achieve optimal postoperative pain relief than other surgical patients. This is because they are at a higher risk for thromboembolic events, which may also be precipitated by immobility from inadequate pain control or excessive sedation from

opioids. Moreover, these women want to ambulate, to be alert and energetic enough to care for, interact with and breastfeed their newborn.

Inadequate pain management after caesarean delivery might affect the emotional well being and physical recovery of patients and affect mother-child bonding.⁵⁶ High pain levels irrespective of mode of caesarean delivery affect breastfeeding and infant care. Good pain control is associated with reduced length of hospital stay and reduced consumption of self-administered analgesia.⁵⁷

With these goals in mind, the analgesic of choice requires minimal transfer in breast milk, little or no effect on neonates, minimal maternal side effects and minimal or no interference with caring for the newborn or discharge from hospital.

3.5.2: Maternal participation in decision making

Decision making about mode of birth presents challenges to women and requires a balance of risks and benefits according to individual circumstances. This is best provided by the medical personnel. Informed decision making enhances women's power within the doctor-patient relationship resulting in increased maternal satisfaction.⁵⁸

The doctor's role in providing proper information is very important because it influences greatly the decision of a mother to have a caesarean section.⁵⁹ A study undertaken to determine women's involvement with the decision preceding their caesarean section found 89.2% of the time the women's perceived reasons for caesarean section agreed with the doctor's reason.⁶⁰ This implies that women generally trust their doctors' assessment of situations and rely on doctors' judgements on the decision to have a caesarean section.

A study conducted by Turnbull and colleagues in a tertiary hospital in Australia found that over a third of women felt they had not been involved in the decision to have a caesarean section.⁵⁹ Another 20% felt they needed more information on other options, and this was not provided. Not surprisingly, satisfaction scores with childbirth were lower for these patients.

Making decisions on whether or not to perform a caesarean section is part of shared decision making between the doctor and the patient.⁶¹ A study carried out to determine mother's satisfaction with

planned caesarean birth reported higher satisfaction ratings, higher scores for fulfillment and lower scores for distress and difficulty compared to unplanned caesarean birth. Maternal satisfaction with childbirth was noted to improve significantly through the support for maternal choices during cesarean section.⁶²

Women differ in the extent to which they desire to be involved in the decision making process.⁶³ Health professionals need to be responsive to this variability and to decide to what extent the parturient is consulted during decision making.

3.5.3: Communication

Effective doctor-patient communication is a central clinical function in building a therapeutic doctor-patient relationship. This is important in the delivery of high-quality health care. Much patient dissatisfaction and many complaints are due to breakdown in the doctor-patient relationship.⁶⁴

A doctor's communication and interpersonal skills encompass the ability to gather information in order to facilitate accurate diagnosis, counsel appropriately, give therapeutic instructions, and establish caring relationships with patients with the ultimate goal of achieving the best outcome and patient satisfaction, which are essential for the effective delivery of health care.⁶⁵ Good doctor-patient communication has the potential to help regulate patients' emotions, facilitate comprehension of medical information, and allow for better identification of patients' needs, perceptions, and expectations.

Studies on doctor-patient communication have demonstrated patient discontent even when many doctors considered the communication adequate or even excellent.⁶⁶

Terry Canale summed it all up when he quipped “the patient will never care how much you know, until they know how much you care.”⁶⁷

3.5.4: Having one's expectations met

Patients' perception of the gap between what they expected and what they received has been shown to have a major role in determining their satisfaction with healthcare services. Expectation is an important element of patients' ratings because an evaluation of healthcare provider's behavior is based on one's expectations for treatment.⁶⁸

Expectations are usually influenced by institutional settings, with common perceptions involving certain hospitals raising or lowering expectations and inevitably, influencing the level of satisfaction.⁶⁸

4.0: JUSTIFICATION FOR THE STUDY

Regional anaesthesia is increasingly the technique of choice for caesarean delivery in most regions of the world, but this has not always been the case. In the past, general anaesthesia was used more often.

In the United States of America, the use of Regional anaesthesia increased from 51% to 84%, between 1981 and 1992, a period of 11 years. In Germany, in 1978, 94% of all operative deliveries were being done under general anaesthesia, but this decreased to 60% for elective cases in 1996. In the West Indies, a decision was taken in 1997 to have at least 60% of all elective Caesarean sections done under spinal anaesthesia. At the beginning of the period, more than 90% of the Caesarean sections were being done under general anaesthesia. By the middle of 1998, spinal anaesthesia was more commonly employed than general anaesthesia for Caesarean sections and by December 2001, more than eight out of every ten Caesarean sections were being done under spinal anaesthesia.⁶⁹

Most anaesthesiologists acknowledge the obvious advantages of using spinal anaesthesia, but it remained to be seen whether the patient population was as appreciative.

Dissatisfaction with theater experience during caesarean delivery can lead to sexual dysfunction, aversion to further pregnancy or birth, and increase in complaints and litigation. This study measured to what extent patients were satisfied and helped identify problem areas for improvement.

No prior study had been done to assess the level of satisfaction with spinal anaesthesia for caesarean delivery at Kenyatta National Hospital.

Every hospital is mandated to improve the quality of its healthcare delivery system, more so the leading teaching and referral hospital in Kenya. Patient satisfaction is an objective measure of this quality, and studies to measure satisfaction provide feedback to the administration and caregivers on what aspects need improvement.

5.0: OBJECTIVES

5.1: Main objective

- To assess the level of maternal satisfaction after undergoing spinal anaesthesia for caesarean delivery at Kenyatta National Hospital.

5.2: Specific objectives:

1. To determine the level of maternal satisfaction with pain control post-operatively.
2. To determine the level of maternal satisfaction with involvement in decision making during spinal anaesthesia.
3. To determine the level of maternal satisfaction with the communication and explanations given for spinal anaesthesia.
4. To determine whether maternal expectations for childbirth were met during spinal anesthesia.

6.0. METHODOLOGY

6.1: Study design

The study was designed as a cross-sectional survey. Interviews were conducted by the principal investigator and data collected in a standardized questionnaire.

6.2: Study site

The study site was the Kenyatta National Hospital general postnatal wards. Kenyatta National Hospital is the largest teaching and referral hospital in Kenya. It is a level 6 referral hospital and has an 1800 bed capacity. It is located within Nairobi, the capital city of Kenya, and is affiliated to the University of Nairobi.

It has three general postnatal wards: GFA, GFB and 1A. Between 4000-4600 caesarean sections are performed every year at the hospital.

6.3: Study population

Parturients who had delivered via caesarean section through the spinal anaesthetic technique at Kenyatta National Hospital and who had not completed 24 hours from the onset of anaesthesia.

6.4: Inclusion criteria

1. Parturients who had undergone caesarean delivery through the spinal anaesthetic technique at the Kenyatta National Hospital.
2. Parturients for whom less than 24 hours had elapsed from the time of delivery.
3. Both elective and emergency cases of caesarean delivery via the spinal anaesthetic technique.
4. Parturients who had consented to participating in the study.

6.5: Exclusion criteria

1. Non-consenting patients.
2. Parturients for whom more than 24 hours had elapsed since the time of delivery.
3. Parturients who had delivered through other modes of anaesthesia, e.g. General anaesthesia, epidural anaesthesia, etc.
4. Parturients who had delivered vaginally.
5. Parturients who were unable to adequately communicate with the principal investigator due to illness, insurmountable language barrier or any other reason.

6.6: Sample size determination and sampling method

The following formula described by Cochran was used to calculate the sample size.⁷⁰

$$n = \frac{Z^2_{(1-\alpha/2)} \times P(1-P)}{d^2}$$

Where;

$Z^2_{(1-\alpha/2)}$ is the standard error of the mean corresponding to a 95% confidence interval and the corresponding value from a t-table is 1.96

n is the sample size.

z is the standard normal deviation at 95% confidence level.

p is the proportion in the targets population i.e. incidence of spinal anesthesia at 64%

d is the target margin of error put at 0.05.

$$n = \frac{(1.96)^2 * 0.66 * 0.34}{0.05^2}$$

n = 345

The consecutive sampling technique was used.

6.7: Data collection

Data was collected using a pre-tested questionnaire. During data collection the principal investigator visited the wards, explained the study to the participants and then assisted the participants to fill the questionnaires.

6.8: Data analysis

The data collected was quantitative. This data was captured electronically and analysis done using SPSS version 17. To describe the study population univariate analysis was used to extract simple frequencies and the data presented graphically. A five-point likert scale⁷¹ was used to measure patients' satisfaction and various inferential statistics were derived to assess association.

6.9: Ethical considerations

1. The nature of the study was explained to the participants in full.
2. Participation in the study was on a voluntary basis and informed consent was given in written form.
3. There were no added costs to the participants and participants could withdraw from the study at any time without any consequences.
4. Anonymity was guaranteed.
5. Study findings were availed to the Ethics Committee of KNH as well as the University of Nairobi.
6. Permission was sought from Kenyatta National Hospital Ethics and Research Committee before undertaking the study.

7.0: RESULTS.

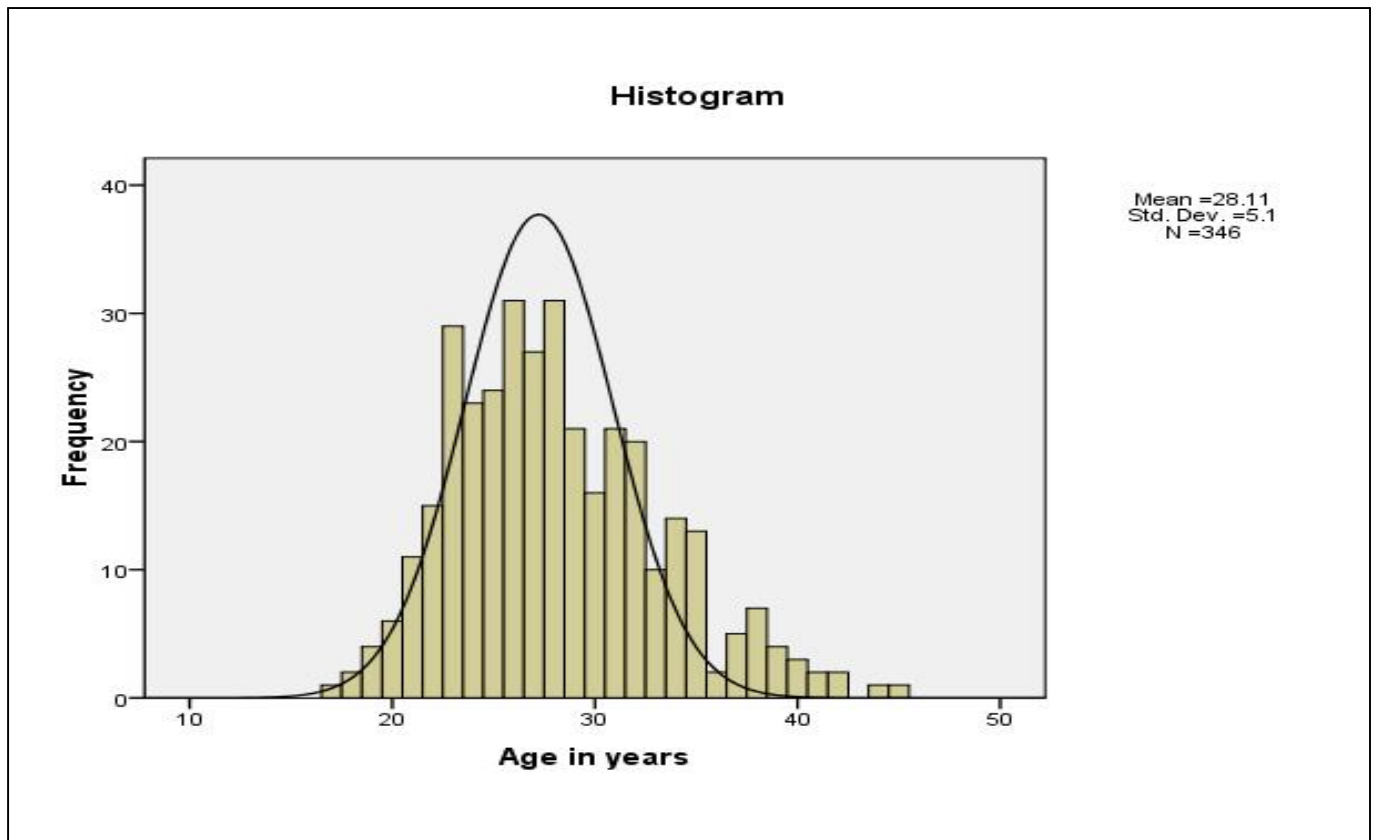
A total of 347 questionnaires were filled. Only one of the 347 questionnaires was spoilt, representing 99.7% rate of returns.

Preliminary data

Age

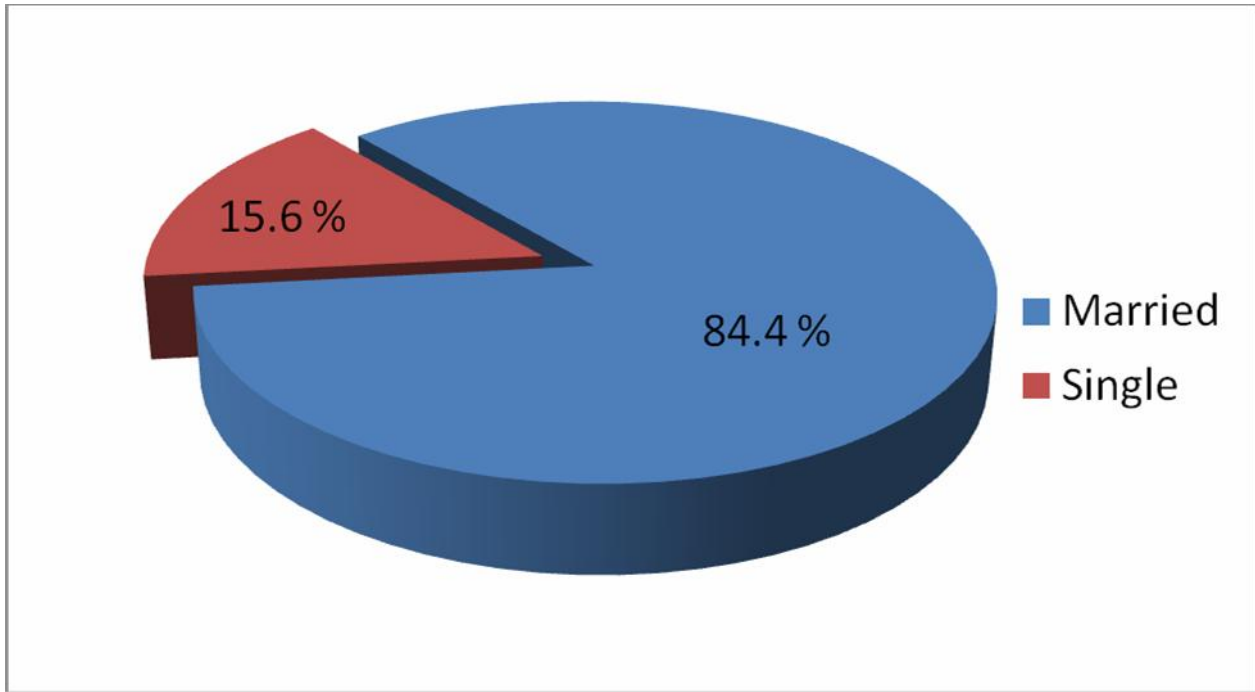
The age of the respondents ranged from 17-45 years as shown in the figure below. The mean age was 28.11 ± 5.1 years.

Figure 1: histogram showing age distribution of the respondents in years.



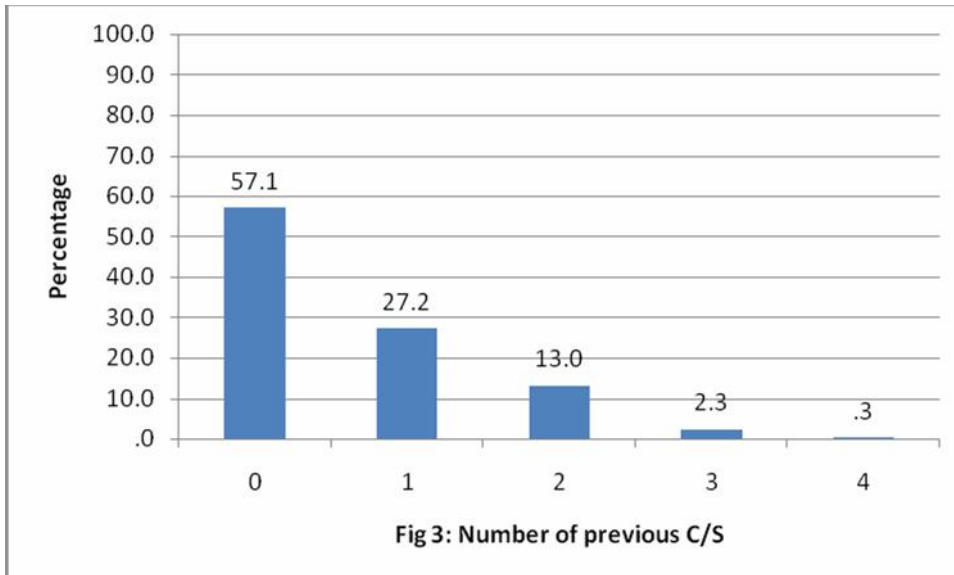
Marital status

Fig 2: pie chart showing marital status of the respondents.



Number of previous caesarean sections

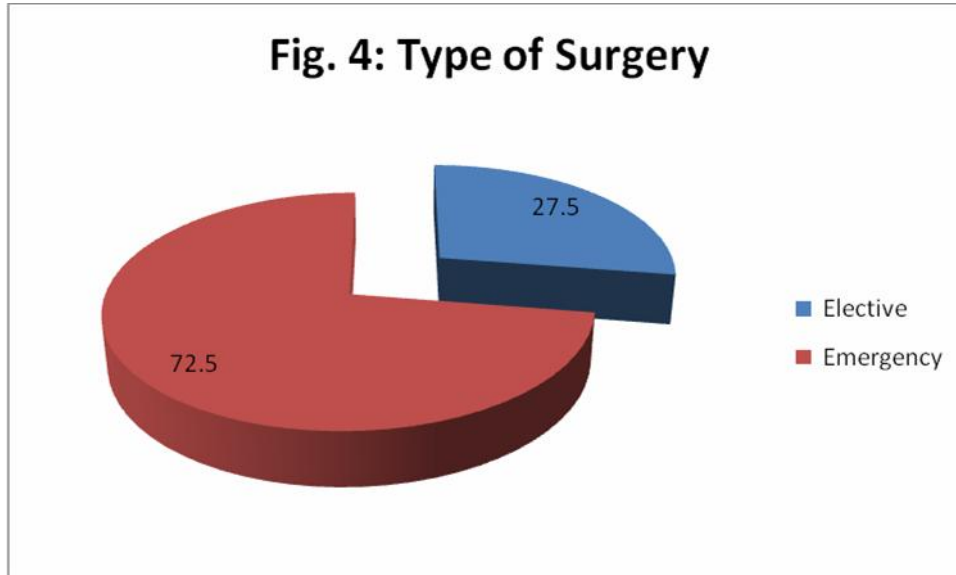
Fig 3: table showing number of previous caesarean sections



Clinical data

Type of surgery

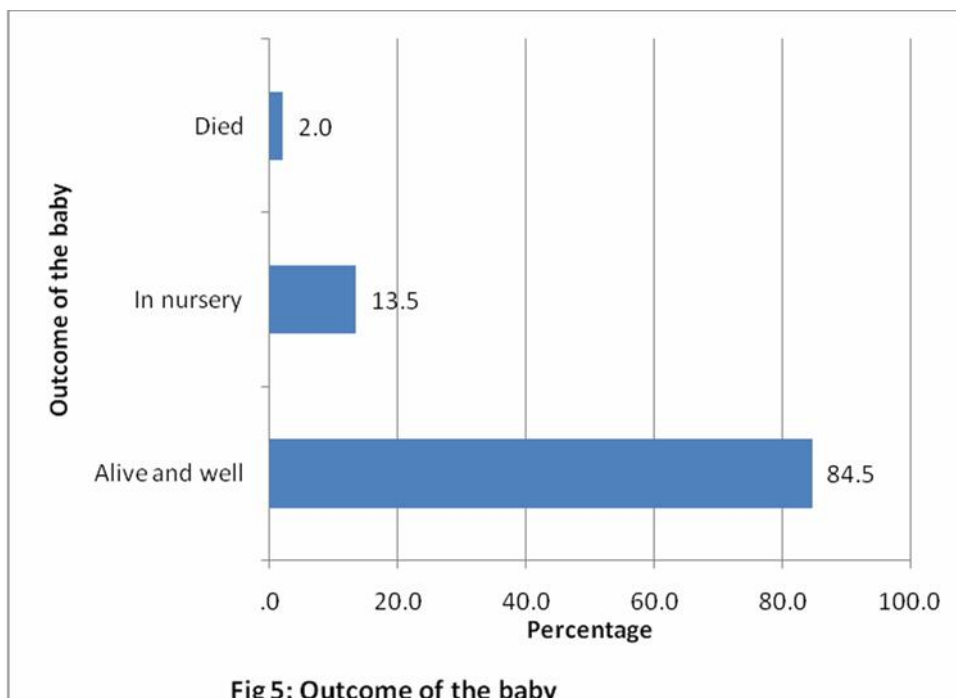
Fig 4: pie chart showing the type of surgery performed on the respondents.



72.5% of the cases were emergency caesarean sections while 27.5% were elective cases.

Neonatal outcome

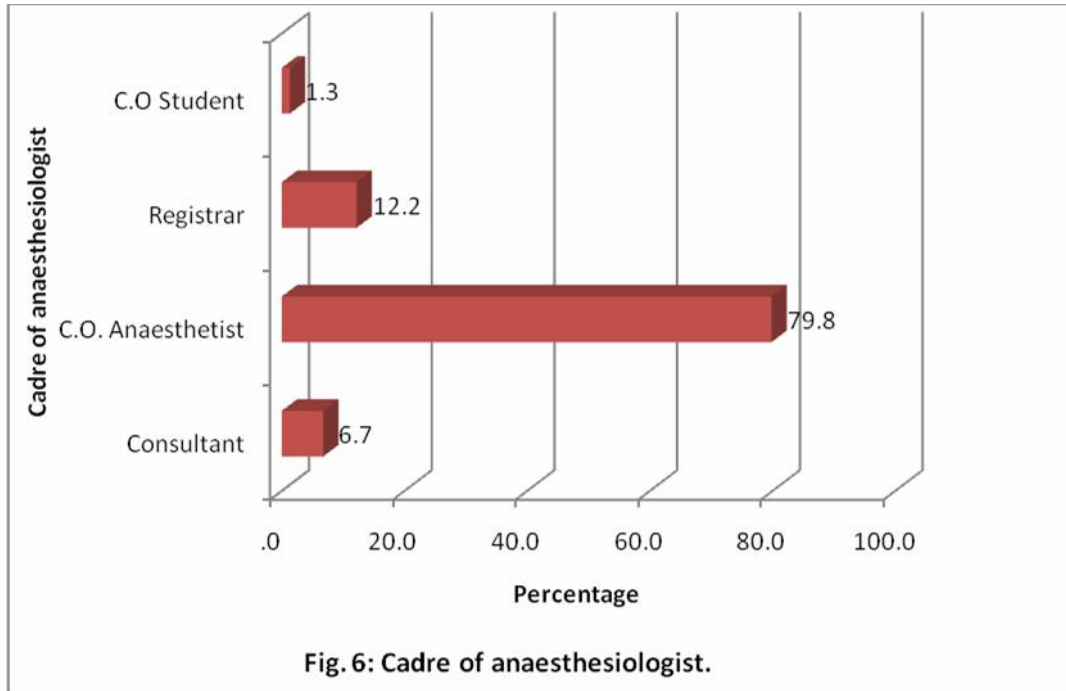
Fig 5: graph showing neonatal outcome post caesarean delivery



Seven out of the 345 deliveries (0.2%) resulted in death of the newborn. 13.5% of the deliveries resulted in admission of the newborns to the newborn unit.

Cadre of anaesthesiologist

Fig 6: graph showing cadre of anaesthetist



Clinical officer anaesthetists provided anaesthesia for most caesarean deliveries(79.8%).

Maternal satisfaction with pain control

Table 1: level of satisfaction with pain control

	Percent(%)
Very Dissatisfied	.9
Dissatisfied	2.6
Neither satisfied nor dissatisfied	7.0
Satisfied	20.9
Very satisfied	68.6
Total	100.0

89.5% of respondents were satisfied with the level of pain control during caesarean delivery.

Satisfaction with involvement in decision making during spinal anaesthesia

Table 2: maternal satisfaction with involvement in decision making during spinal anaesthesia

	Percent(%)
Very dissatisfied	1.7
Dissatisfied	1.4
Neither satisfied nor dissatisfied	4.6
Satisfied	23.4
Very satisfied	68.8
Total	100.0

92.2% of respondents were satisfied with their involvement in decision making during spinal anaesthesia for caesarean delivery.

Satisfaction with the communication and explanations given for spinal anaesthesia

Table 3: communication and explanations by the anaesthesia provider

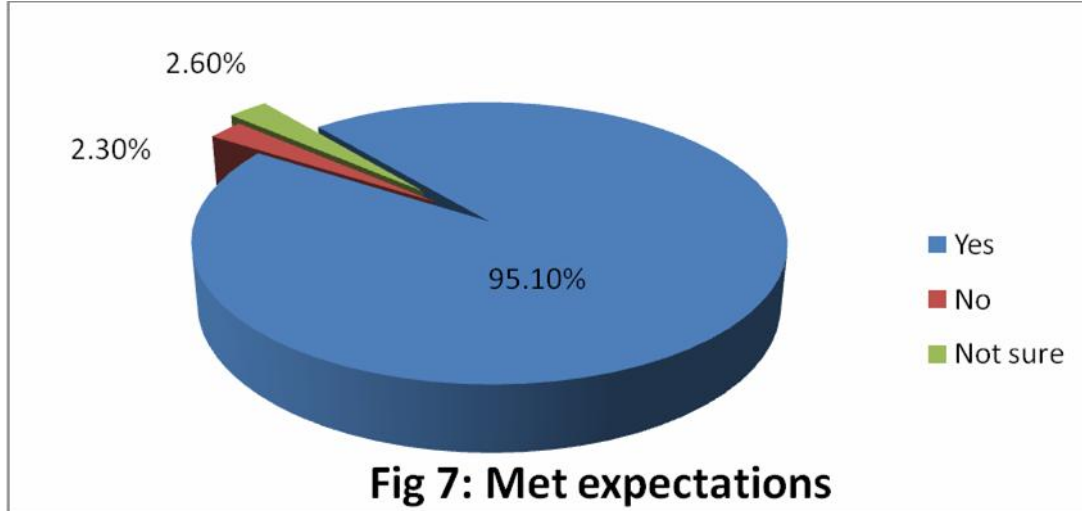
	Very Dissatisfied (%)	Dissatisfied (%)	Neither satisfied nor dissatisfied (%)	Satisfied (%)	Very satisfied (%)
The level of communication from the anesthesia provider	.3	.6	4.3	13.3	81.5
The amount of explanation received from anesthesia practitioners during birth	.9	1.4	6.6	13.9	77.2

94.8% of respondents were satisfied with the level of communication between them and their anaesthesia providers during their caesarean delivery.

91.1% of the respondents were satisfied with the explanations for spinal anaesthesia given to them by the anaesthesia providers.

Met expectations for childbirth

Fig. 7: pie chart showing met expectations for childbirth

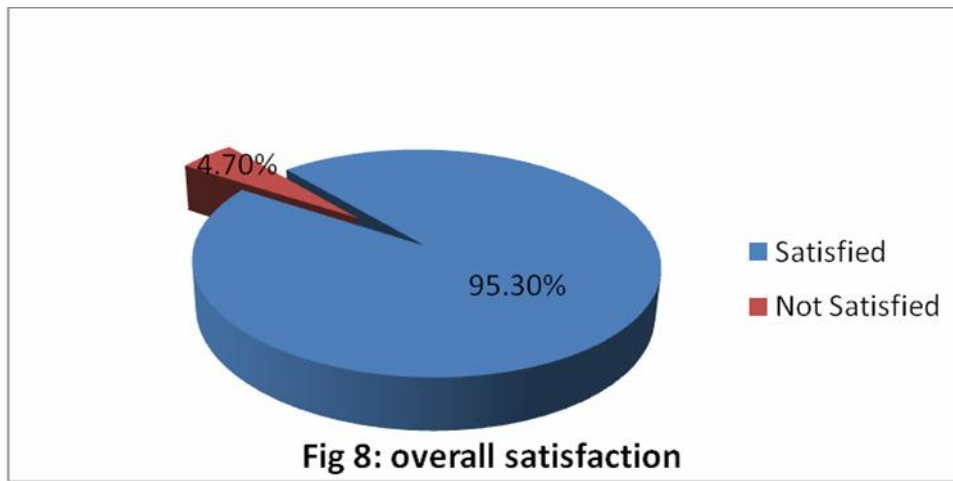


95.1% of respondents felt their expectations for childbirth had

been met during caesarean delivery.

Overall satisfaction with the birthing experience

Fig 8: pie chart showing overall satisfaction with childbirth



95.3% of respondents were satisfied with their overall birthing experience.

Other related and ancillary issues

Table 4: other related and ancillary issues

	Very Dissatisfied (%)	Dissatisfied (%)	Neither satisfied nor dissatisfied (%)	Satisfied (%)	Very satisfied (%)
The physical care you received from the anaesthesia practitioner during birth	.3	.6	2.3	15.7	81.2
The technical knowledge, ability & competence of anaesthesia practitioners during birth	.3	.9	7.5	22.5	68.8
The personal interest and attention given to you by anaesthesia practitioners during birth	.6	.0	3.2	13.0	83.2
The attitude of anaesthesia practitioners during birth	.3	.3	3.2	10.7	85.5
The satisfaction with spinal anesthetic technique	2.6	3.5	13.9	26.0	54.0
The anaesthesia practitioner's sensitivity to your needs during birth	.6	.3	2.0	12.2	84.9

The satisfaction ratings for care received, knowledge of the anaesthesia provider, interest shown by the anaesthesia provider, general attitude of the anaesthesia provider and anaesthesia provider's sensitivity to the respondents' needs were all over 90%.

The overall satisfaction with the spinal anaesthetic technique was 80%.

Demographic variables and their influence on maternal satisfaction:

We attempted to determine the influence of marital status, outcome of the baby, cadre of the anaesthetist and number of previous caesarean sections on maternal satisfaction.

The only variable that had a significant influence on maternal satisfaction was the outcome of the baby. (two-by-two table chi square test, 1 d.f, $p=0.006$)

Table 5: Other variables and their influence on maternal satisfaction

		Overall satisfaction level		P value
		Not satisfied	Satisfied	
Marital Status	Married	4.4%	95.6%	0.696
	Single	5.7%	94.3%	
Number of previous caesarean section	0	3.0%	97.0%	0.119
	1	9.6%	90.4%	
	2	2.2%	97.8%	
	3	.0%	100.0%	
	4	.0%	100.0%	
Type of surgery	Elective	4.3%	95.7%	0.821
	Emergency	4.9%	95.1%	
Outcome of the baby	Alive and well	4.2%	95.8%	0.006
	In nursery	2.2%	97.8%	
	Died	28.6%	71.4%	
Cadre of anaesthesiologist	Consultant	9.5%	90.5%	0.893
	C.O. Anaesthetist	4.8%	95.2%	
	Registrar	5.3%	94.7%	
	C.O Student	.0%	100.0%	

8.0: DISCUSSION

The major aim of this study was to determine maternal satisfaction with spinal anaesthesia for caesarean delivery. Several aspects of intraoperative care that were thought likely to influence maternal satisfaction were assessed.

A total of 346 respondents were interviewed. Their demographic characteristics were quite similar to those from the Kenyan population derived from The Kenya Demographic and Health Survey¹⁰. Therefore the sampled respondents were representative of the Kenyan population.

There was a high level of maternal satisfaction with intra operative pain control (89.5%). Very few studies on intraoperative pain have been done, with most studies concentrating on post operative pain. Sidiqqi and colleagues conducted a study on intraoperative pain control in Pakistan and found a satisfaction score of 74.08%.⁴⁷

The higher satisfaction score in the Kenyan study could be due to the timing of data collection. The study done in Pakistan had no limit on time of data collection after delivery while the one done in Kenya had a 24 hour time limit. Because of this, delayed adverse effects of spinal anaesthesia such as post dural puncture headache were more likely to have occurred in the Pakistan study.

The significance of this finding is that spinal anaesthesia is effective in controlling pain during and immediately after caesarean delivery.

The level of satisfaction with involvement of the respondents in decision making was high (92.2%). Other studies done elsewhere to determine satisfaction with involvement with decision making have yielded comparable results. Mould and colleagues found that women going for elective caesarean delivery had a 93% satisfaction score for involvement in decision making while those going for emergency delivery had a 69% satisfaction rating⁶⁰. Graham and Hundley also had similar results⁶³. Turnbull and colleagues reported a 90.9% satisfaction with the decision to have a caesarean delivery⁵⁹.

From these comparisons, we can deduce that the level of satisfaction with involvement of women in decision making for caesarean delivery is as good as that seen in other countries where similar studies were done. Studies should be done to compare satisfaction with decision making for elective patients and compare them to those for emergency patients at Kenyatta Hospital.

The level of satisfaction with both communication and explanations given for spinal anaesthesia were high (94.8% and 91.1%, respectively). A number of studies have identified poor communication as a significant negative predictor of maternal satisfaction,^{64,66} but none of them assessed to what extent it influenced satisfaction. Poor communication resulted in patient-doctor conflict in 8.3% of cases in one study, resulting in failure to give informed consent for delivery.⁷²

The high level of satisfaction with communication shows that anaesthesia providers working at Kenyatta National Hospital have good communication skills.

A large majority of respondents felt that their expectations for caesarean delivery were fulfilled. (95.1%). Met expectations for childbirth is the most important determinant of maternal satisfaction.⁶⁸ Liyong and Quhong, in their study, identified met expectations as one of the strongest predictors of satisfaction with caesarean delivery

The significance of this finding is that since most respondents' expectations were met, we would expect their overall satisfaction to be correspondingly high.

Satisfaction with spinal anaesthetic technique was good and stood at 80%. This is similar to that reported by Siddiqi and colleagues (81.4%).⁴⁷

The overall satisfaction with the birthing experience was high (95.3%). A study done by Shapiro and colleagues in Canada showed a satisfaction rating of 88%.⁷³ Another study done by Wacharin, et al in Vietnam showed a satisfaction score of 90.03%⁷⁴ while another done by Rhee and associates in Korea showed a satisfaction score of 96.3%.⁷⁵ While each of these studies studied different factors that influenced satisfaction during caesarean delivery, their overall satisfaction ratings were similar.

Satisfaction with service delivery is one of the major determinants of quality of care in a hospital. With this in mind, data from this study shows that Kenyatta National Hospital provides very high quality care in the maternity theater that is comparable to that provided in Korea, Vietnam, Canada and other countries.

Other aspects of intraoperative anaesthetic care that were tested in the study all showed satisfaction scores of over 90%. These included technical ability and competence of the anaesthesia provider and anaesthesia provider's sensitivity to the respondents' needs.

The cadre of anaesthetist, urgency of the operation, marital status and number of prior caesarean deliveries had no influence on maternal satisfaction.

Neonatal outcome was shown to have a strong influence on maternal satisfaction with spinal anaesthesia. Mothers whose neonates died were more likely to be dissatisfied compared to mothers whose neonates were alive and well. Respondents whose neonates had a poor outcome (i.e. died) were 6.8 times more likely to be dissatisfied with spinal anaesthesia for caesarean delivery.

No prior study has been published which showed neonatal outcome influencing maternal satisfaction. It is unclear whether the dissatisfaction with spinal anaesthesia for respondents who had a poor neonatal outcome was due to blaming the anaesthetic technique itself or due to an unfavourable recall bias due to the unfavourable outcome. Future studies should be designed to determine this.

9.0: CONCLUSIONS

1. Spinal anaesthesia is effective in controlling pain during and immediately after caesarean delivery.
2. Maternal satisfaction with involvement in decision making for caesarean delivery at Kenyatta National Hospital is high.
3. Maternal satisfaction with the communication skills of anaesthesia providers in Kenyatta National Hospital during caesarean delivery is high.
4. Spinal anaesthesia for caesarean delivery is associated with high levels of met expectations for childbirth at Kenyatta National Hospital.
5. The overall satisfaction with spinal anaesthesia for caesarean delivery at Kenyatta National Hospital is 80%.
6. Neonatal outcome is an important contributor to maternal satisfaction with caesarean delivery at Kenyatta National Hospital.

10.0: RECOMMENDATIONS

1. Spinal anaesthesia should be adopted in a protocol as the anaesthetic management technique of choice to be used in all caesarean deliveries unless there are specific contraindications.
2. Standardized questionnaires on patient satisfaction should be formulated to regularly assess quality of healthcare service delivery at Kenyatta National Hospital.
3. Further studies are recommended to determine maternal satisfaction after general anaesthesia and to compare it to spinal anaesthesia.

11.0: LIMITATIONS OF THE STUDY

Due to the euphoria associated with childbirth, respondents were more likely to recall their experiences favorably at the time of data collection. This euphoria has been shown to result in over estimation of satisfaction scores and it lasts throughout the period the patient is still admitted to hospital.

Satisfaction is subjective and prone to change even in a single respondent with time. This makes it very difficult to measure or even to reproduce the same results given the exact settings.

12.0: REFERENCES

1. The constitution of Kenya. **Bill of rights**. 2010. Cap 4. 31-2
2. Smith JE, Fisher DL, Endorf-Olson JJ. **Integrating patient satisfaction into performance measurement to meet improvement challenges 2000**. Jt Comm J Qual Patient Saf. 2000; 26: 277-86
3. Rijnders M, Baston H, Schonbeck Y, et al. **Perinatal factors related to negative or positive recall of birth experience in women 3 years postpartum in the Netherlands**. Birth (Berkeley, Calif.) 2008; 35: 107-16
4. Cherouny P, Federico FA, Haraden C, et al. **Idealized design of perinatal care**. IHI innovation series white paper2005; Institute for Healthcare Improvement, www.IHI.org
5. Spector WD, Takada HA. **Characteristics of nursing homes that affect resident outcomes**. J Aging & Health 1991; 3(4): 427-454
6. Frommer S, Michael B, Rubin M, et al. **The NSW Health Outcomes program**. New South Wales Public Health Bulletin 3 1992; (12): 135
7. Maciosek MV, Coffield AB, Edwards NM, et al. **Priorities among effective clinical preventive services: results of a systematic review and analysis**. Am J Prev Med. 2006 Jul;31(1):52-61
8. Mayo clinic staff. **C-section**. Mayo Foundation for Medical Education and Research 2010 (MFMER). MY 00214. www.MayoClinic.com
9. Gabbe SG, Niebyl JR, Simpson JL. **Obstetrics: Normal and problem pregnancies** 5th Ed. 492-512
10. Central Bureau of Statistics (CBS), Ministry of Health (MOH), and ORC Macro. 2009. **Kenya Demographic and Health Survey 2009**. Calverton, Maryland: CBS,MOH, and ORC Macro 2009; 9(3): 123
11. Gibbons L, Belizan JM, Lauer JA, et al. **The global numbers and costs of additionally needed and unnecessary cesarean sections performed per year: Overuse as a barrier to universal coverage**. WHO report 2010, background paper 30. www.who.com
12. Althabe F, Sosa C, Belizan J, et al. **Cesarean Section Rates and Maternal and Neonatal Mortality in Low-, Medium-, and High-Income Countries: An Ecological Study**. Birth 2006; 33(4): 270-7

13. ACOG Practice Bulletin Number 49, December 2003: ***Dystocia and augmentation of labor.*** 2009. *Obstet Gynecol.* Dec 2003;102(6):1445-54
14. Hankins GD, Clark SM, Munn MB. ***Caesarean section on request at 39 weeks: impact on shoulder dystocia, fetal trauma, neonatal encephalopathy, and intrauterine fetal demise.*** *Semin Perinatol.* 2006;30(5):276-87
15. ACOG Committee Opinion No. 340. ***Mode of term singleton breech delivery.*** *Obstet Gynecol.* Jul 2006;108(1):235-7
16. Cruikshank DP. ***Intrapartum management of twin gestations.*** *Obstet Gynecol.* May 2007;109(5):1167-76
17. Luthy DA, Wardinsky T, Shurtleff DB, et al. ***Cesarean section before the onset of labor and subsequent motor function in infants with meningomyelocele diagnosed antenatally.*** *N Engl J Med.* Mar 7 1991;324(10):662-6
18. Brown ZA, Wald A, Morrow RA, et al. ***Effect of serologic status and cesarean delivery on transmission rates of herpes simplex virus from mother to infant.*** *JAMA.* Jan 8 2003;289(2):203-9
19. Martin JA, Hamilton BE, Sutton PD, et al. ***Births: final data for 2002.*** *Natl Vital Stat Rep.* Dec 17 2003;52(10):1-113
20. Faiz AS, Ananth CV. ***Etiology and risk factors for placenta previa: an overview and meta-analysis of observational studies.*** *J Matern Fetal Neonatal Med.* Mar 2003;13(3):175-90
21. Buchmann EJ, Libhaber E. ***Sagittal suture overlap in cephalopelvic disproportion: blinded and non-participant assessment.*** *Acta Obstet Gynecol Scand.* 2008;87(7):731-7
22. Landon MB. ***Vaginal birth after cesarean delivery.*** *Clin Perinatol.* Sep 2008;35(3):491-504, ix-x
23. Zaric D, Christiansen C, Pace NL, et al: ***Transient neurologic symptoms after spinal anesthesia with lidocaine versus other local anesthetics: A systematic review of randomized, controlled trials.*** *Anesth Analg* 2005; 100: 1811–1816
24. Gonzalez A, Amasha R, Yaksh T. ***Spinal anesthesia adjuvants.*** *Am Soc Reg Anesth* 2012, Pain Resource Centre Site. www.asra.com.
25. Gogarten W. ***Spinal Anaesthesia for Obstetrics.*** *Best Practice & Research Clin Anaesth* 2003; 17(3); 377-92
26. Donald L. ***Complications of spinal anaesthesia.*** *Int Anaesth Clinics* 1989; 27(1); 51-55

27. American Society of Anesthesiologists (ASA). ***Continuum of Depth of Sedation Definition of General Anesthesia and Levels of Sedation/Analgesia.*** www.asa.org. 2004. Amended October 21, 2009
28. Shafer S, Varvel J. ***Pharmacokinetics, pharmacodynamics and rational opioid selection.*** *Anesth* 1991; 74: 53-63
29. Schneck H, Scheller M, Wagner R, et al. ***Anesthesia for cesarean section and acid aspiration prophylaxis: a German survey.*** *Anesth Analg* 1999; 88: 63–6
30. Davies T, Guibarra E. ***Muscle relaxation during abdominal surgery.*** *Am J Surg.* 1980: 139(3); 459-60
31. Hadzic A. ***Is regional anaesthesia really better than general anaesthesia?*** *Anaesth and Analg* 2005; 101: 1631-3
32. Hawkins JL, Koonin LM, Palmer SK, et al. ***Anaesthesia related deaths during obstetric delivery in the United States, 1979-1990.*** *Anaesthesiology* 1999; 86: 277-84
33. Wong' CA, Loffredi M, Ganchiff JN, et al. ***Gastric emptying of water in pregnancy.*** *Anaesthesiology* 2002; 96: 1395
34. Lyons G, MacDonald R. ***Awareness during caesarean section.*** *Anaesthesia* 1991; 46: 62
35. Ong BY, Cohen MM, Palahniuk RJ. ***Anaesthesia for caesarean section- effects on neonates.*** *Anaesth Analg* 1989; 68:270
36. Myhre JM, Riesner MN, Polley LS, et al. ***A series of anaesthesia- related maternal deaths in Michigan 1985-2003.*** *Anaesthesiology* 2007; 106: 1096-1104
37. Biro P. ***Difficult intubation in pregnancy.*** *Curr Opin Anaesth* 2011; 24(3): 249-54
38. Barnado PD, Jenkins JG. ***Failed tracheal intubation in obstetrics: a 6 year review in a UK region.*** *Anaesthesia* 2000; 55: 685-94
39. Rudra A, Mondal M, Acharya A, et al. ***Anaesthesia related maternal mortality.*** *J Indian Med Assoc.* 2006; 104(6): 312-6
40. Marcus HE, Behrend A, Schier R, et al. ***Anaesthesiological management of caesarean sections: Nationwide survey in Germany.*** *Anaesthetist* 2011(Epub ahead of print)
41. Fumanik J. ***A survey of anaesthesia for caesarean sections in Poland.*** *Anestezjol Intens Ter.* 2010; 42 (2): 65-9

42. Weiniger CF, Ivri S, Loscovich A, et al. ***Obstetric anaesthesia units in Israel: A nationwide questionnaire based survey.*** Int J Obstet Anaesth 2010; 19(4): 410-6
43. Searle RD, Lyons G. ***Vanishing experience in training for obstetric general anaesthesia: an observational study.*** Int J Obstet Anaesth 2008; 17(3): 233-7
44. Liu S, Strodbeck W, Richman J, et al. ***A comparison of regional vs general anaesthesia for ambulatory anaesthesia: A meta-analysis of randomized controlled trials.*** Anaesth and Analg 2005; 101: 1634-42
45. Fassoulaki A, Staikou C, Melemenis A, et al. ***Anaesthesia preference, neuraxial vs general, and outcome after caesarean section.*** Informa Healthcare, J Obstet Gynecol 2010; 30(8): 818-21
46. Bukar M, Kwari DY, Moruppa JY, et al. ***Anaesthesia for caesarean delivery: Choice of technique among antenatal attendees in North Eastern Nigeria.*** J Obstetr Gynecol 2010; 30(8): 822-25
47. Siddiqi R, Jaffri SA. ***Maternal satisfaction after spinal anaesthesia for caesarean deliveries.*** J Coll Physicians Surg (Pakistan) 2009; 19(2): 77-80
48. Slade P, Macpherson A, Hume A, et al. ***Expectations, experiences and satisfaction with labour.*** Br J Clin Psychology 1993; 32: 469-83
49. Bramadat IJ, Driedger M. ***Satisfaction with childbirth: theories and methods of measurement.*** Birth 1993; 20(1): 22-29
50. Williams B. ***Patient satisfaction- A valid concept.*** Social Sciences & Medicine 1994; 38: 509-16
51. Hodnett ED. ***Pain and women's satisfaction with the experience of childbirth: a systematic review.*** Am J Obstet Gynecol 2002; 186 (S supp Nature): S160-S172
52. Porter M, van Teijlingen F, Chi Ying Yip L, et al. ***Satisfaction with caesarean section: Qualitative analysis of open ended questions in a large postal survey.*** Birth 2007; 34(2): 148-54
53. Lavender T., Walkinshaw S.A., & Walton I. (1999) ***A prospective study of women's views of factors contributing to a positive birth experience.*** Midwifery 15, 40-46
54. Turk DC, Okifuji A. ***Assessment of patients' reporting of pain: an integrated perspective.*** Lancet 1999; 352: 1784-88
55. Apfelbaum JL, Chen C, Mehta SS, et al. ***Postoperative pain experience: results from a national survey suggest postoperative pain continues to be undermanaged.*** Anesth Analg 2003; 97: 534-40

56. Tan EC, Lim Y, Teo YY, et al. ***Ethnic differences in pain perception and patient controlled analgesia for postoperative pain.*** J. Pain 2008; 9(9): 849-55
57. Karlström A, Enqström-Oloffson R, Nystedt A, et al. ***Women's postoperative experiences before and after the introduction of spinal opioids in anaesthesia for caesarean section.*** J Clin Nurs 2010; 19(9): 1326-34
58. Shorten A, Shorten B, Keogh J, et al. ***Making choices for childbirth: a randomized controlled trial of a decision-aid for informed birth after caesarean.*** Birth 2005; 32(4): 252-61
59. Turnbull DA, Wilkinson C, Yager A, et al. ***Women's role and satisfaction in the decision to have a caesarean section.*** Med J Aust 1999; 170(12): 580-83
60. Mould TA, Chong S, Spencer JA, et al. ***Women's involvement with the decision preceding their caesarean section and their degree of satisfaction.*** Br J Obstet Gynaecol 1996; 103(11): 1074-7
61. Moffat MA, Bell JS, Porter MA, et al. ***Caesarean by choice? Empirical study of public attitudes.*** Acta Obstet Gynecol 2008; 87(12): 1301-8
62. Blomquist JL, Quiroz LH, Macmillan D, et al. ***Mothers' satisfaction with planned vaginal and planned caesarean birth.*** Am J Perinatol 2011; 28(5): 383-8
63. Graham WJ, Hundley V, McCheyne AL. ***An investigation of women's involvement in the decision to deliver by caesarean section.*** BJOG 1999; 106(3): 213-20
64. Hong J, Longnecker N. ***Doctor patient communication: A review.*** Ochsner J. 2010 Spring; 10(1): 38-43
65. Duffy F, Gordon G, Whelan G, et al. ***Assessing competence in communication and interpersonal skills: the Kalamazoo II report.*** Acad Med. 2004; 79(6): 495-507
66. Stewart M. ***Effective physician-patient communication and health outcomes: a review.*** CMAJ. 1995; 152(9): 1423-1433
67. Tong D, Chung F, Wong D. ***Predictive factors in global and anaesthesia satisfaction in ambulatory surgical patients.*** Anaesth 1997; 87(4): 856-64
68. Qunhong S, Liyang T. ***Patient preferences, concerns, and satisfaction with providers before the Chinese urban health system reform: A social groups analysis.*** Asia health Policy Program Working Paper 17, 2010. www.asiahealthpolicy.stanford.edu

69. Crawford-Sykes A, Scarlett M, Hambleton R, Nelson M, et al. ***Anaesthesia for operative deliveries at the University Hospital of the West Indies: a change of practice.*** West Indian Med J 2005; 54 (3): 19-24
70. Bartlett J, Kotrlik J, Higgins C. ***Organizational research: Determining appropriate sample size in survey research.*** IT, Learning and Performance J 2001; 19(1): 43-50
71. Likert R. ***A Technique for the Measurement of Attitudes.*** Archives of Psychology 1932; 140: 1–55
72. Lescale KB, Inglis SR, Eddleman KA, et al. ***Conflicts between physicians and patients in non-elective caesarean deliveries: Incidence and the adequacy of informed consent.*** Am J Perinatol 1996; 15(3): 171-6
73. Shapiro J. Satisfaction with obstetric care. ***Patient survey in a family practice-shared call group.*** Can Fam Physician 1999; 45: 651-57
74. Wacharin S, Ruenreong L, Oraluxna R, et al. ***Maternal satisfaction to epidural and spinal anaesthesia for caesarean section.*** J Med assoc Thai 2004; 87(6): 628-34
75. Rhee WJ, Chung CJ, Lim YH, et al. Factors in patient dissatisfaction and refusal regarding spinal anaesthesia. Korean J Anaesthesiol 2010; 59 (4): 260-4

APPENDIX 1: GENERAL PATIENT INFORMATION AND CONSENT FORM

Introduction

My name is Dr. Alex Kasuku, a post graduate student in Anaesthesia at the University of Nairobi. I am conducting a survey to measure the level of satisfaction among patients who have undergone spinal anesthesia for caesarean section at Kenyatta National Hospital. This study will be conducted between April and June 2012.

Purpose of the study

The aim of the study is to determine the level of satisfaction among mothers who have delivered via caesarean section through the spinal anaesthetic technique at Kenyatta National Hospital. This will help to identify areas of weakness in which the hospital can improve in service delivery.

Interventions.

The procedure will involve the use of a questionnaire and there will be no interventions.

Voluntary participation.

Your participation in this study is entirely voluntary. You reserve the right to withdraw from the study at any stage.

Risks and benefits.

You are not exposed to any risks by participating in this study. However, because you were exposed to spinal anaesthesia less than 24 hours ago, you are still at risk for the delayed harmful effects of spinal anaesthesia such as severe headache, infection within your spinal canal, prolonged loss of sensation in your legs and bleeding into your spinal canal.

During this study no further interventions will be carried out and you are only requested to answer a few questions.

The results from this study will help the hospital to improve service delivery in the future.

Confidentiality

We will only use initials of your name for confidentiality purposes. This will guarantee that the information you give us will remain confidential.

Contacts

For any questions or clarifications you can contact the following people;

- Dr. Alex Kasuku - 0723 090 606 or kaskimani@yahoo.com
- Dr. Timothy Muriithi- 0721 366 294 or Mtmwiti@yahoo.com
- Dr. Thomas Chokwe – 0722 528 237 or tchokwe@yahoo.com

This proposal has been reviewed and approved by the KNH/UON Ethics and Research Committee. Upon acceptance to participate in the survey, please sign the provided informed consent form.

Any further enquiries can be directed to:-

The secretary, Ethics & Research Committee, KNH/UON. Email : uonknh_erc@uonbi.ac.ke.

Tel: (254-020) 2726300 Ext 44355

Thank you.

Consent form

PATIENT'S SECTION

I of do hereby give consent to participate in the above study whose nature, benefits and risks have been fully explained to me by the researcher. I have not been coerced or enticed to participate and voluntarily gave permission. I have been assured of my confidentiality and that am free to withdraw from the study at any stage.

Signature

Date.....

RESEARCHER'S SECTION

I have explained the nature of the study to the participant detailing the benefits and risks of the study and have not withheld any information. I have assured the participants of their confidentiality and the right to withdraw from the study at any stage.

Signature.....

Date.....

Fomu ya idhini kushiriki

SEHEMU YA MGONJWA.

Mimi.....kutoka mji wanimetoa kibali changu kushiriki katika utafiti huu. Nimeelezwa juu ya manufaa ya utafiti huu vilevile kuhusu madhara yanayoweza kutokea na nimekubali kushiriki kwa hiari yangu.

Nimeahidiwa kuwa habari zozote nitakazotoa zitabakia siri na nina uhuru wa kujiondoa kwenye utafiti huu wakati wowote

Sahihi Tarehe.....

SEHEMU YA MTAFITI

Mimi mtafiti nimemweleza mshiriki kwa kina kuhusu utafiti huu,manufaa na madhara yote bila kuficha habari zozote.Pia nimemweleza kuwa habari zozote atakazotoa zitabakia siri na kwamba ana uhuru wa kujiondoa kwenye utafiti huu wakati wowote bila dhuluma.

Sahihi Tarehe.....

APPENDIX 2: QUESTIONNAIRE

A. Preliminary information

Initials of Parturient..... Date.....Serial no.....

Age.....yrs Parity..... Marital status.....

No. of previous caesarean sections.....

Approximate time since delivery hrs

Type of surgery: Elective

Emergency

Outcome of baby: Alive and well

In nursery

Died

Cadre of anaesthesiologist: Consultant

C.O. Anaesthetist

Registrar

C.O. Student

B. Study data (Circle one response for each item.)

	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
1. The level of pain control	1.	2.	3.	4.	5.
2. Your level of participation in decision making	1.	2.	3.	4.	5.
3. The level of communication from the anaesthesia provider	1.	2.	3.	4.	5.
4. The satisfaction with spinal anaesthetic technique	1.	2.	3.	4.	5.
5. The physical care you received from the anaesthesia practitioner during birth	1.	2.	3.	4.	5.
6. The technical knowledge, ability & competence of anaesthesia practitioners during birth	1.	2.	3.	4.	5.
7. The amount of explanation received from anaesthesia practitioners during birth	1.	2.	3.	4.	5.

8. The personal interest and attention given to you by anaesthesia practitioners during birth 1. 2. 3. 4. 5.
9. The attitude of anaesthesia practitioners during birth 1. 2. 3. 4. 5.
10. The anaesthesia practitioner's sensitivity to your needs during birth 1. 2. 3. 4. 5.
11. Overall, the care you received during birth 1. 2. 3. 4. 5.
12. Overall, how satisfied were you with the whole childbirth experience in theater? 1. 2. 3. 4. 5.

13. Generally, were your expectations met during the birthing experience? **(tick the correct answer)**

Yes

No

Not sure

Thank you for your time and cooperation.

APPENDIX 3: DODOSO

A: Preliminary information

Herufi za mgonjwa..... Tarehe..... Nambari.....

Umri.....miaka idadi ya mimba Hadhi ya ndoa.....

Idadi ya oparesheni za awali za kujifungua mimba

Takriban masaa tangu kujifungua

Aina ya upasuaji: Wa dharura

Usio wa dharura

Matokeo ya upasuaji: Mtoto yu salama

Amelazwa kwenye nursery

Mtoto aliona mauti

B: Study data (Circle one response for each item.)

	Sikuridhika kamwe	sikuridhika	Sikuridhika wala kutoridhika	Niliridhika	Niliridhika sana
1. Kiwango cha kudhibiti maumivu	1.	2.	3.	4.	5.
2. Kushiriki katika kufanya maamuzi ya kufanywa upasuaji	1.	2.	3.	4.	5.
3. Mawasiliano na aliye kufisha ganzi	1.	2.	3.	4.	5.
4. Mbinu iliyotumiwa ya unusukaputi	1.	2.	3.	4.	5.
5. Huduma ya kimwili uliyopokea kutoka kwa aliyekufisha ganzi	1.	2.	3.	4.	5.
6. Maarifa ya kiufundi, uwezo na ubora wa aliyekufisha ganzi	1.	2.	3.	4.	5.
7. Utoشهلهزي wa maelezo uliyopewa wakati wa	1.	2.	3.	4.	5.

upasuaji

- | | | | | | |
|--|----|----|----|----|----|
| 8. Kiwango cha kujaliwa maslahi na kipaumbele ulichopewa na aliyekufisha ganzi | 1. | 2. | 3. | 4. | 5. |
| 9. Mtazamo wa aliye kufisha ganzi wakati wa upasuaji | 1. | 2. | 3. | 4. | 5. |
| 10. Kujalia maslahi yako kwa aliyekufisha ganzi | 1. | 2. | 3. | 4. | 5. |
| 11. Kwa jumla, huduma uliyopokea wakati wa upasuaji | 1. | 2. | 3. | 4. | 5. |
| 12. Kwa ujumla, kiwango chako cha kuridhika na huduma uliyopewa kwenye chumba cha upasuaji | 1. | 2. | 3. | 4. | 5. |

13. Je, matarajio yako yalidikhiwa ulipokuwa ukijifungua? **(tick the correct answer)**

Ndio

La

Sina uhakika

APPENDIX 4: BUDGET ESTIMATES

Item	Quantity	Cost in kshs
Biostatistician	-	20,000
Ethics and research committee	-	1,000
Paper	3 rims	6,000
Flash drives/compact discs	2 each	1,500
Printing	-	5,000
Photocopying	-	2,000
Other consumables(airtime/pens etc)	-	2,000
Internet services	-	5,000
GRAND TOTAL	-	42,500

APPENDIX 5: WORK PLAN

ACTIVITY	2011 Aug- 2012 Jan	2012 Feb	2012 Mar	2012 Apr	2012 May	2012 June
Proposal Writing	ō					
Presentation to Ethics and Research Committee		ō	ō	ō		
Data Collection				ō	ō	
Data Processing					ō	
Report Writing						ō
Study Presentation						ō