

**POSTPARTUM SEXUAL RESUMPTION AND DYSFUNCTION IN  
PRIMIPAROUS WOMEN SEEN AT MOI TEACHING AND REFERRAL  
HOSPITAL, ELDORET, KENYA**

**BY**

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**A thesis submitted in partial fulfillment of the requirement for the award of the  
Degree of Master of Medicine in Reproductive Health, School of Medicine,**

**Moi University**

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## DECLARATION

### **Declaration by Candidate**

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## **DEDICATION**

This work is dedicated to all who have committed their life to scientific inquiry, critical investigation, and the use of reason in enlightening humanity in its efforts to evaluate claims to knowledge and the application of the resultant knowledge to improve the quality of all life.

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## ABSTRACT

**Background:** Globally there is an effort to provide comprehensive postpartum care by assessing sexual resumption and dysfunction. This has received little attention in Kenya. Most studies on this topic are international, cross-sectional in design, and few utilize validated tools with conflicting results.

**Objective:** To assess sexual resumption and dysfunction in the first postpartum year among Primiparous women seen at Moi Teaching and Referral Hospital, Kenya.

**Methods:** A prospective cohort study at Moi teaching and referral hospital. Systematic sampling involving every seventh Primipara delivery was used to recruit 125 women. They were followed up at the postnatal clinic for one year at five intervals (six, ten, fourteen weeks then at nine and twelve months). Data was collected on socio-demographics, obstetric characteristics, infant feeding options, contraceptive use, antenatal sex education, and time to resumption of sexual intercourse. A self-administered validated Female Sexual Function Index questionnaire was used to assess for sexual dysfunction (Total score  $\leq 26$ ). Data was summarized using frequency and percentages for categorical variables and measures of central tendency and dispersion for continuous variables. Bivariate and multivariable logistic regression analyses were carried out to test for association between several factors (socio-demographic and clinical) and sexual dysfunction at one year.

**Results:** The median age was 23 years (Range:19-43), majority 69.6% had University/college education, 67.2% had no occupation and 96.0% lived within Uasin Gishu County. The median gestation was 40 weeks (Range:37-44), majority 79.2% had a vaginal delivery, median birth weight 3200 grams (Range:1500-4300) and 52.5% had intact perineum. Minority 20.0% received antenatal sexual health education. The median duration of sexual intercourse resumption was 72 days (Range:43.0-98.0). The proportion of those who resumed was 0.9%, 17.2%, 52.6%, 58.5% and 59.4% during the five visits while sexual dysfunction based on overall score was 30.0%, 39.0%, 29.5%, 29.0% in second, third, fourth and fifth visits respectively. On the fifth visit, 46.8% had pain disorder, 53.2% desire disorder, 58.1% sexual dissatisfaction, 64.5% orgasmic problems, 79.0% arousal disorder, 90.3% lubrication difficulty, 31.1% used a contraceptive with the most common (24.2%) being Implanon. Several factors (age, education level, occupation, residence, mode of delivery, perineal injury, birth weight, antenatal sex education, and contraceptive use) were tested at bivariate analysis none was statistically significant. After adjusting for age, education, birth weight, and contraceptive use, those with perineal injury had higher odds of experiencing sexual dysfunction (AOR:5.70, 95% CI:1.41-28.5, p-value 0.02).

**Conclusion:** The median duration to resumption of sexual intercourse by women in this study was 72 days with a majority having resumed by one year. Of those who had resumed, a minority had sexual dysfunction with the most common being lubrication difficulty. Perineal injury was significantly associated with this dysfunction.

**Recommendations:** Postpartum care should involve assessing women for sexual resumption and dysfunction throughout the first year. The use of vaginal lubricants should be considered as needed and perineal injury after delivery should be managed appropriately. Further studies should incorporate a qualitative approach.

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**LIST OF ABBREVIATIONS AND ACRONYMS**

<b>ANC</b>	Antenatal Clinic
<b>CD</b>	Caesarean Delivery
<b>COC</b>	Combined Oral Contraceptive Pills
<b>Cu IUD</b>	Copper Intrauterine Contraceptive Device
<b>DMPA</b>	Depo-Medroxyprogesterone Acetate
<b>FREQ</b>	Frequency
<b>FSFI</b>	Female Sexual Function Index
<b>HoD</b>	Head of Department
<b>IREC</b>	Institutional Research and Ethics Committee
<b>JADELLE™</b>	A brand name for a set of two Levonorgestrel hormone-releasing birth control implants that are surgically placed and removed under the skin of the inner aspect of the arm
<b>MBChB</b>	Bachelor of Medicine and Bachelor of Surgery
<b>MMED</b>	Master of Medicine
<b>MOH</b>	Ministry of Health
<b>MTRH</b>	Moi Teaching and Referral Hospital
<b>NA</b>	Not Applicable
<b>N-miss</b>	Number Missing

<b>OBS/GYN</b>	Obstetrics and Gynecology
<b>POP</b>	Progesterone Only Pills
<b>RH</b>	Reproductive Health
<b>RMBH</b>	Riley Mother and Baby Hospital
<b>SD</b>	Standard Deviation
<b>USA</b>	United States of America

## OPERATIONAL DEFINITION OF TERMS

**Postpartum:** This refers to the one year after delivery.

**Primiparous Woman:** A woman who has given birth for the first time.

**Sexuality:** A central aspect of being human throughout life encompassing sex, gender identities, and roles, sexual orientation, eroticism, pleasure, intimacy, and reproduction. It is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviors, practices, roles, and relationships. While sexuality can include all of these dimensions, not all of them are always experienced or expressed.

**Sexual Health:** This is a state of physical, emotional, mental, and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction, or infirmity.

**Sexual Dysfunction:** This refers to a problem that occurs during the sexual response cycle that prevents the individual from experiencing satisfaction from sexual activity.

**Sexual Response Cycle:** This refers to a series of physical and emotional phases that occur when a person becomes aroused or engages in sexually stimulating activities.

**Sexual Activities:** This is a behavioral expression of one's sexuality where the erotic component of sexuality is most evident. It is characterized by behaviors that seek eroticism and is synonymous with sexual behavior which could be coital like penile-vaginal intercourse but can also be non-coital like masturbation, manual stimulation by one's partner, oral sex, or fantasy.

**Sexual Health Concerns:** These are life situations that require preventive and educational actions by society (From a variety of professionals often not needing specialized clinical training) to ensure its members attain and maintain Sexual Health.

**Sexual Health Problems:** These are the result of conditions, either in an individual, relationship, or a society, that require specific action usually by clinically trained professionals for their identification, prevention, and/or treatment and therefore, eventual resolution.

**The Degree of Perineal Tears:** A first-degree tear is defined as a perineal laceration extending through the vaginal mucosa and perineal skin only; a second-degree tear is a perineal laceration extending into the perineal muscles; a third-degree tear is a perineal laceration involving the external anal sphincter; a fourth-degree tear involves both the anal sphincter and the anorectal mucosa.

**Resumption of Sexual Intercourse:** This refers to the resumption of Peno-vaginal intercourse after delivery.

**The Incidence of Postpartum Sexual Dysfunction:** This refers to the proportion of respondents with a Female Sexual Function Index total score of 26 or less at each of the five study intervals (six, ten, and fourteen weeks then at nine and twelve months postpartum).

## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Study Background

Delivery is a major event in any new mother's life, it brings with it the enhancement of family bonds through the joy of having a newborn. However, delivery is also characterized by several health challenges. These challenges could be physical including genital tract injury, bleeding, or infection, they could also be psychological like depression or anxiety, and finally, they could be social with the new mother balancing employment, education, and family life (Borders, 2006).

In offering postpartum care to the new mother, healthcare providers identify any health problems that may hinder the resumption of normal life after delivery. This is done through the provision of service that focuses on several areas. First is counseling on personal hygiene, nutrition, breast care, infant care, danger signs, healthy timing, and spacing of pregnancy by using an effective contraceptive. Secondly is by screening for medical conditions like Human Immune Deficiency virus infection and finally provisions of supplements like vitamins and hematinic (WHO, 2010).

Comprehensive postpartum care also involves assessing the resumption and maintenance of healthy sexual life after delivery. This assessment should be informed by the best evidence on various aspects of postpartum sexual health.

In Kenya, the main guide during postpartum care is the Ministry of Health, Mother and Child Health Booklet, MOH 216 (Ministry of Health, 2013). It provides numerous pieces of advice on various aspects of postpartum care. However, it only includes a single piece of advice on sexual health after delivery.



## **1.2 Problem Statement**

The provision of comprehensive postpartum care should ensure that a new mother has a satisfying sexual life. However, in Kenya, there is limited focus on assessing sexual health as part of postpartum care. Considering that in our community it's still taboo to openly talk about one's sexual life, new mothers with sexual health concerns or problems could suffer silently or seek advice from those who may not be well informed about sexual health and may offer them harmful advice. This challenge is further compounded by a paucity of data on this topic in the county.

International efforts to bridge this gap are underway with several studies addressing various components of postpartum sexual health. However, most of these studies are cross-sectional in design and utilize non-validated questionnaires making the comparison of evidence from different regions difficult.

The cross-sectional design of most of these international studies limits the ability to assess sexual dysfunction trends over time to ascertain if it worsens or improves. If there is an improvement over time, then the so-called dysfunction could only be a transient decline in function. Such a trend can best be assessed via a longitudinal study design.

These studies also report varying proportions of postpartum sexual dysfunction and conflicting results about both the type and extent of influence of factors associated with this dysfunction.

This study sought to fill the above gaps by assessing the time taken and proportion of sexual intercourse resumption, the incidence, and factors associated with postpartum sexual dysfunction prospectively over one year using a validated questionnaire.

### **1.3 Justification**

This study sought to improve postpartum care by bridging the gap of no or limited data from our local population on various aspects of postpartum sexual health. Availability of such data is critical since there is marked variability in sexual health among different populations which limit the use of data from other international centers in accurately representing our local population.

The study incorporated a longitudinal study design to generate data that elucidates several key areas of postpartum sexual health.

First, it provides data on duration to and proportion of sexual intercourse resumption after delivery. Secondly, it assesses the proportion of postpartum sexual dysfunction at five intervals over one year thereby allowing assessment of the trend over time. Thirdly, it provides further data on factors associated with sexual dysfunction at the end of the one-year follow-up period, and finally, the use of a validated questionnaire allows for ease of comparison of data from other study centers.

### **1.4 Significance**

The data generated from this study about the time taken to resumption of sexual intercourse, the incidence, and factors influencing postpartum sexual dysfunction in our region will assist new mothers, their partners, and the communities at large to begin a conversation on issues of sexual health after delivery. This allows for continued interaction of new mothers and their healthcare providers on this critical and often ignored topic.

This study also aids healthcare providers and policy planners in their continued effort to deliver more holistic and evidence-based comprehensive postpartum care.

The study provides baseline information upon which other researchers can build to further elucidate the emergent concept of postpartum sexual health.

### **1.5 Research Questions**

1. How long do Primiparous women who deliver at MTRH take to resume sexual intercourse?
2. What proportion of Primiparous women who deliver at MTRH resume sexual intercourse in the first postpartum year?
3. What is the incidence of sexual dysfunction in the first postpartum year in Primiparous women who deliver at MTRH?
4. What are the factors associated with sexual dysfunction in the first postpartum year in Primiparous women who deliver at MTRH?

### **1.6 Objectives**

#### **1.6.1 Broad Objective**

To assess sexual resumption and dysfunction in the first postpartum year in Primiparous women who deliver at MTRH.

#### **1.6.2 Specific Objectives**

1. To determine the time taken to resume sexual intercourse in Primiparous women who deliver at MTRH.
2. To determine the proportion of sexual intercourse resumption in the first postpartum year in Primiparous women who deliver at MTRH.
3. To determine the incidence of sexual dysfunction in the first postpartum year in Primiparous women who deliver at MTRH.
4. To determine factors associated with sexual dysfunction in the first postpartum year in Primiparous women who deliver at MTRH.

## CHAPTER TWO

### 2.0 LITERATURE REVIEW

There is a limited focus on assessing sexual health after delivery as part of postpartum care. Global efforts are underway to bridge this gap by offering compressive postpartum care that incorporates the assessment of resumption and maintenance of healthy sexual life after delivery. These efforts include: First a better understanding of the female sexual response cycle to develop adequate tools to assess sexual function. Secondly the elucidation of the concept and component of postpartum sexual health and finally, finding better models of care for those who suffer from any dysfunction.

The above efforts are best guided by evidence derived from various studies on postpartum sexual health. However, most of these studies are international with limited local data. A systematic review of studies on postpartum sexual health over five decades reported that 44% were carried out in the USA, 41% in Europe (including Israel), 7% in Asia, 5% in Australia, and only 3% were from Africa (Sydow, 1999).

### 2.1 Sexual Response Cycle

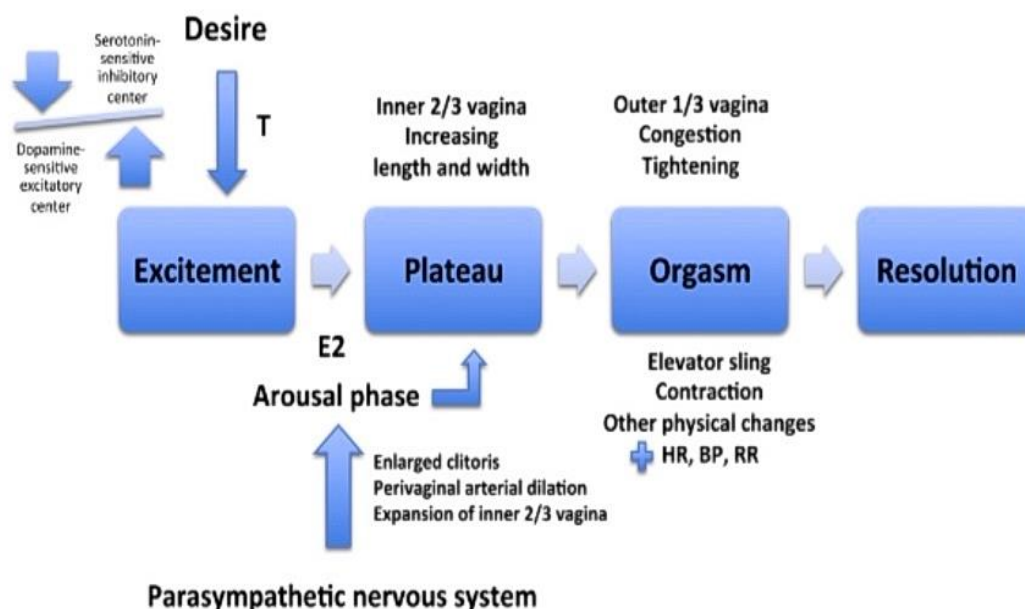
This refers to a series of physical and emotional phases that occur when an individual becomes aroused or engages in sexually stimulating activities (coital and non-coital). Sexual function is commonly studied by assessment of the phases of this cycle using various tools. Several models have been proposed to describe the female sexual response cycle. Some of these models include the linear model by Master and Johnson and later another by Kaplan. Secondly the circular model by Whipple and Brash-McGreer and finally the non-linear model by Basson.

### 2.1.1 Linear Models

In 1966, Masters and Johnson proposed a linear model of sexual response for both men and women composed of four stages, beginning with excitement or arousal and proceeding to plateau, orgasm, and resolution.

In 1979, Kaplan added the concept of desire to the model and condensed the response into three phases: desire, arousal, and orgasm.

These linear frameworks have been called into question in women for several reasons: first, they assume that men and women have similar sexual responses, and in so doing may pathologize normal behavior in women. It's also noted that many women do not move progressively and sequentially through the phases as described and finally as a largely biological model, the above two frameworks do not take into account non-biologic experiences such as pleasure and satisfaction or place sexuality in the context of the relationship (Damjanović, Duišin & Barišić, 2013).



**Figure 1: Physiologic changes during the Sexual Response Cycle (Chen et al., 2013)**

### **2.1.2 Circular Model**

In 1997, Whipple and Brash-Mc Greer proposed a circular sexual response pattern for women. This concept is built on the Reed model, which comprises four stages: seduction (encompassing desire), sensations (excitement and plateau), surrender (orgasm), and reflection (resolution).

By making Reed's model circular, Whipple and Brash-Mc Greer demonstrate that pleasant and satisfying sexual experiences may have a reinforcing effect on a woman, leading to the seduction phase of the next sexual experience. If during reflection, the sexual experience did not provide pleasure and satisfaction, the woman may not have a desire to repeat the experience (Damjanović et al., 2013).

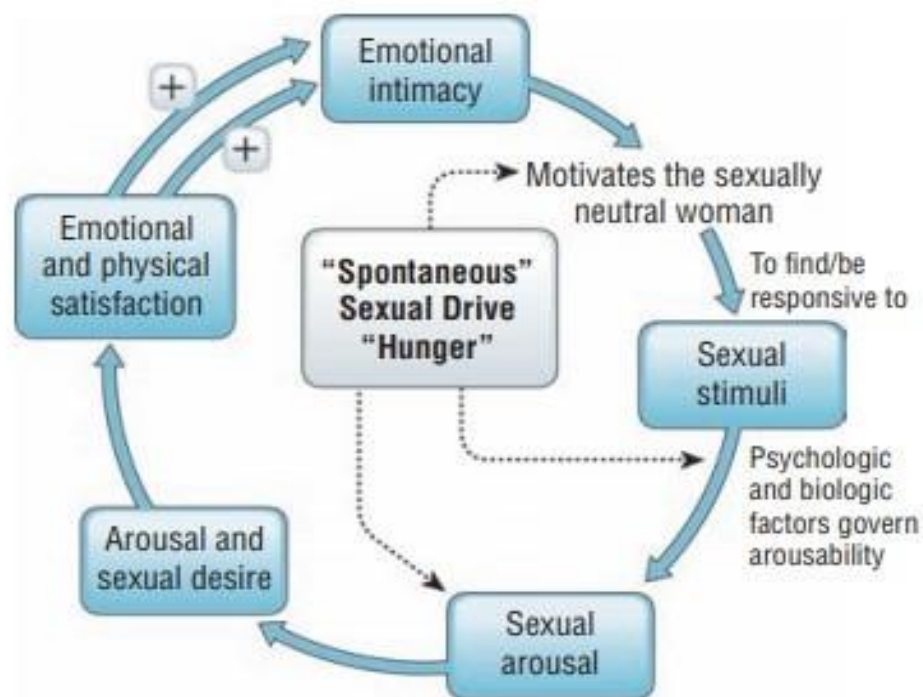
### **2.1.3 Non-Linear Model**

In the year 2000, Basson also constructed a new model of female sexual response that incorporates the importance of emotional intimacy, sexual stimuli, and relationship satisfaction. This model acknowledges that female sexual functioning proceeds in a more complex and circuitous manner than male sexual functioning and that female functioning is dramatically and significantly affected by numerous psychosocial issues (including satisfaction with the relationship, self-image, and previous negative sexual experiences).

According to Basson, women have many reasons for engaging in sexual activity other than sexual hunger or drive, as the traditional model suggests. Although many women may experience spontaneous desire and interest while in a new sexual relationship or after a long separation from a partner, most women in long-term relationships do not frequently think of sex or experience spontaneous hunger for sexual activity.

Basson suggests that a desire for increased emotional closeness and intimacy or overtures from a partner may predispose a woman to participate in sexual activity. From

this point of sexual neutrality—where a woman is receptive to being sexual but does not initiate sexual activity—the desire for intimacy prompts her to seek ways to become sexually aroused via conversation, music, reading or viewing erotic materials, or direct stimulation. Once she is aroused, sexual desire emerges and motivates her to continue the activity. On the road to satisfaction, there are many points of vulnerability that may derail or distract a woman from feeling sexually fulfilled. The Basson model clarifies that the goal of sexual activity for women is not necessarily orgasm but rather personal satisfaction, which can manifest as physical satisfaction (orgasm) and/or emotional satisfaction (a feeling of intimacy and connection with a partner) (Damjanović et al., 2013).



**Figure 2: The Female Sex Response Cycle** (Basson, 2001)

## **2.2 Concept of Postpartum Sexual Health**

O'Malley, Higgins, and Smith (2015) undertook a philosophical analysis of the concept of postpartum sexual health using a principle-based approach based on four philosophical principles: Epistemological, pragmatic, linguistic, and logical.

They concluded that postpartum sexual health is underdeveloped as a concept with an elusive theoretical definition and cannot be separated theoretically from sexuality and sexual function. They identified the antecedents of postpartum sexual health as an instrument-free birth, intact perineum, and avoidance of episiotomy. Its attributes include sexual arousal, desire, orgasm, sexual satisfaction, and resumption of sexual intercourse and its outcomes as sexual satisfaction and a satisfying intimate relationship with one's partner.

## **2.3 Assessment of Components of Postpartum Sexual Health**

Studies assessing the components of postpartum sexual health have focused on various aspects that include time taken and proportion of sexual intercourse resumption; prevalence and factors associated with sexual dysfunction.

### **2.3.1 Time to Resumption of Sexual Intercourse**

Several studies have looked at the time to resumption of sexual intercourse after delivery to assess if it occurs before or after the first routine postnatal clinic visit. Traditionally, the first postnatal clinic is scheduled six weeks after an uncomplicated delivery. Since many new mothers may opt to delay initiation of contraceptives up to this clinic visit, higher rates of early resumption of sexual intercourse may represent an increased risk of unplanned pregnancy. It may also indicate the need for counseling of the new mothers on possible sexual health concerns or problems they may encounter in this period and any available solutions.



Internationally, a systematic review by Sydow (1999) reported that in Europe and USA, the median resumption time was 42 to 56 days while in Iran Amiri, Omidvar, Bakhtiari, Yazdani, and Hajiahmadi (2015) reported a median time of 62.3 days.

Regionally, Anzaku and Mikah (2014) in Nigeria reported a resumption time of 56 days while Aribi et al. (2012) in Tunisia reported a median duration of 120 days. However, little is known about the time to resumption of sexual intercourse in Kenya which represents a gap in offering comprehensive postpartum care in the county.

### **2.3.2 Proportion of Sexual Intercourse Resumption**

Internationally, Fodstad, Staff, and Laine (2016) in Norway reported 51.4 % of their respondents had resumed intercourse by eight weeks, increasing to 75.2 % by 12 weeks and 94.7 % by one year postpartum, elsewhere Sok, Sanders, Saltzman, and Turok (2016) in Utah, the United States reported by life-table analysis 43% of women had resumed sexual intercourse by six weeks postpartum.

Regionally in Africa, Alum, Kizza, Osingada, Katende, and Kaye (2015) in Uganda reported that 21.9 % of participants in their study had resumed coitus before six weeks after childbirth and in Nigeria Adanikin, Awoleke, Adeyolu, Alao, and Adanikin (2014) reported that 27.6% of women had coitus within six weeks, increasing to 63.3% at three months and 70.2% by six months post-delivery.

### **2.3.3 Female Sexual Dysfunction**

According to American Psychiatric Association, female sexual dysfunction is a disturbance in the processes that characterize the sexual response cycle or by pain associated with sexual intercourse.

Sexual difficulties are common among women, but whether a problem causing distress is a “dysfunction” as opposed to a normal or logical response to difficult circumstances

(a problem with the relationship, sexual context, or cultural factors) remains controversial.

Based on the recent work of the International Committee of the American Foundation of Urological Disease a new expanded and revised definitions which form part of the second International Consultation on Sexual Medicine: Men and Women's Sexual Dysfunctions, there are 5 major categories of dysfunction as below (Basson, 2005).

The first is *Sexual desire/interest disorder* characterized by are absent (or diminished) feelings of sexual interest or desire, sexual thoughts or fantasies, and responsive desire. Motivating reasons or incentives for attempting to become sexually aroused are scarce or absent. The lack of interest is beyond the normative lessening that may occur with the life cycle and relationship duration.

The second is the *Combined sexual arousal disorder* which is characterized by absent or markedly reduced *subjective* sexual arousal (feelings of excitement, pleasure) from any type of stimulation, and absent or impaired *genital* sexual arousal (Vulval swelling, lubrication).

The third is a category of *arousal disorders* that include the following three conditions. *Subjective* sexual arousal disorder in which there is absent or markedly reduced subjective sexual arousal (feelings of excitement, pleasure) from any type of stimulation. Vaginal lubrication and other signs of the physical response still occur. The other subgroup in the *Genital* arousal disorder is characterized by absent or impaired genital sexual arousal: minimal Vulval swelling or vaginal lubrication from any type of sexual stimulation, and reduced sexual sensation from the caress of the genitalia. Subjective sexual excitement still occurs from non-genital sexual stimuli. The final arousal disorder in the *Persistent* sexual arousal disorder is defined by spontaneous, intrusive, and unwanted genital arousal (tingling, throbbing) when sexual interest or

desire is absent. Any awareness of subjective arousal is typically but not invariably unpleasant. The arousal is unrelieved by orgasm(s) and persists for hours or days.

The fourth is an *orgasmic disorder* in which despite self-report of high sexual arousal, orgasm from any kind of stimulation is lacking, markedly diminished in intensity, or considerably delayed.

The final category includes; *Vaginismus* a persistent or recurrent difficulty in allowing vaginal entry of a penis, finger, or any object, despite the woman's expressed wish to do so. There is often (phobic) avoidance; anticipation, fear, or experience of pain; and variable involuntary contraction of pelvic muscles. Structural or other physical abnormalities must be ruled out or addressed. It also includes *Dyspareunia* which is defined as persistent or recurrent pain with attempted or complete vaginal entry or penile-vaginal intercourse.

### **2.3.4 Postpartum Female Sexual Dysfunction**

The assessment of postpartum sexual dysfunction has been done in various ways which include identifying sexual health concerns or problems using different tools most of which are not validated. One such international study was by Barrett et al. (2000) in England who identified that at three and six months after birth 83% and 64% of women respectively had at least one indicator of sexual health problems. Some of these problems were loss of sexual desire, reduced frequency of coitus, vaginal dryness, vaginal pain, vaginal bleeding or irritation after sex, and reduced satisfaction with sex.

To better understand sexual function several tools have been developed focusing on assessing various aspects of the sexual response cycle. One such tool is the Female Sexual Function Index (FSFI) a validated 19 item questionnaire that provides scores on six domains of sexual function: desire, arousal, lubrication, orgasm, satisfaction, and pain (Meston & Derogatis 2002).

The FSFI is in wide use internationally, however regionally in Africa, this tool has had limited use (Eid, Sayed, Abdel-Rehim & Mostafa 2015). In Kenya, while it has not been used in assessing postpartum sexual function, this tool has found use in assessing sexual function in several other areas of study. These include sexual dysfunction and diabetes mellitus (Ungaya, 2011), psychosocial determinants of elective cesarean delivery (Oguta, 2016), sexual disorder after genital mutilation (Esho et al., 2017), sexual dysfunction and contraceptive use (Butt, Lema, Mukaindo, Mohamoud & Shabani 2019) and female sexual dysfunction and infertility (Oindi, Murage, Lema & Mukaindo, 2019).

Several international studies assessing the burden of postpartum sexual dysfunction have been carried out using the FSFI tool. These studies include that by Khajehei, Doherty, Tilley, and Sauer (2015) in Australia who reported that 64.3% of their participants had sexual dysfunction during the first year after delivery. In another study using this tool, Chayachinda, Titapant, and Ungkanungdech (2015) in Thailand reported postpartum sexual dysfunction of 66.7% at 3 months, 31.0% at 6 months, and 14.9% at 12 months. Regionally in Africa, there are however limited studies on the rate of postpartum sexual dysfunction with a paucity of data from Kenya.

#### **2.4. Factors Associated with Postpartum Sexual Dysfunction**

Several factors have been studied to assess any association with postpartum sexual dysfunction. These factors have been broadly classified as physical, psychological, social, and relational (DeJudicibus & McCabe 2002; Sydow, 1999).

### **2.4.1 Socio-Demographic Characteristics**

There are several studies have been carried out from different regions evaluating the association between socio-demographic characteristics and postpartum sexual function with conflicting findings. Some of those studies include the following:

Chang, Chang, Chen, and Lin (2010) using the Taiwan version of the Female Sexual Function Index showed significant differences in sexual function shortly after delivery between groups based on several factors including ethnicity and educational level.

De lima Holanda, Vieira Abuchaim, Coca, and Freitas De Vilhena Abrão (2014), carried out a cross-sectional study that involved 200 postpartum women in Brazil to estimate the prevalence and factors associated with sexual dysfunction in the postpartum period. They concluded that the prevalence of sexual dysfunction was high and associated with several factors including the following religion, working hours, previous history of dysfunction, and type of delivery.

Alum et al. (2015) carried out a cross-sectional study on 374 Ugandan women six months after delivery. This study tested for any association between the resumption of sexual intercourse after childbirth and several factors including socio-demographic characteristics of the participant, socio-demographic characteristics of the spouse, perceived cultural norms, medical history, mode of delivery, and postpartum complications. They concluded that participants' education level, occupation, and parity; education level of the spouse, age of baby, and use of family planning were significantly associated with early resumption of sexual intercourse after childbirth.

Song et al. (2014) in Japan carried out a study that involved 435 women to assess factors affecting female sexual function six months after delivery. Their results noted an

association between maternal age and several domains of the Female Sexual Function Questionnaire (SFQ28) used in assessing sexual function.

Yee, Kaimal, Nakagawa, Houston, and Kuppermann (2013) in a prospective study in California, the USA involving a total of 160 postpartum women assessed the relationships between sexual function and demographic factors, mode of birth, depression and breastfeeding. They discussed the influence of multiparity and younger age in predicting the early resumption of sexual activity.

Yeniél & Petri (2013) carried out a systematic review to examine current literature for reliable data on the role of pregnancy and the mode of delivery on sexual health and different dysfunctions. This was occasioned by very heterogenic and inconclusive data on the effect of pregnancy and mode of delivery on postpartum sexual function.

They used a Medline database search with key terms like “cesarean section,” “childbirth,” “delivery,” “mode of delivery,” “postpartum,” “pregnancy,” “puerperium,” “sexual dysfunction,” “sexual function,” and “sexuality.” These researchers evaluated randomized, prospective, and retrospective studies published in the English language from 1960 to 2012.

The result showed that sexual function decreases throughout pregnancy, getting worse as the pregnancy progresses. Decreasing desire and orgasm, increasing pain and other sexual dysfunction problems in the first three months gradually improved within six months after delivery. This process is affected by many factors such as socio-cultural, age, parity, breastfeeding, depression, tiredness, sexual inactivity during the first trimester, postpartum body image, worries about getting pregnant again, and concomitant urinary tract infections are reported as independent risk factors for sexual dysfunction.

They concluded that there is no clear evidence of a relationship between the mode of delivery and changes in sexual function. Quality of sexual life should be part of history taking because of the possible sequelae of pregnancy and delivery. More adequately powered studies are necessary to answer the many open questions.

#### **2.4.2 Mode of Delivery**

The mode of delivery which include Cesarean delivery (planned or emergency), Vaginal delivery (Spontaneous or assisted) with or without perineal injury (Episiotomy or tears) has been postulated to affect sexual function after delivery. Numerous studies have been carried out to evaluate whether there is any influence and the extent of influence on sexual function with conflicting findings.

The results from some of these studies indicate that operative vaginal delivery is associated with sexual dysfunction/poor sexual health outcomes that include postpartum dyspareunia.

Safarinejad, Kolahi, and Hosseini (2009) in Iran carried out a prospective study to quantify the relationship between mode of delivery and subsequent incidence of sexual dysfunction and impairment of quality of life (QOL) in women and their husbands. The main outcome was the sexual function of pregnant women and their husbands. This was assessed using Female Sexual Function Index (FSFI), and the International Index of Erectile Function (IIEF), respectively.

All women and their husbands were also asked to indicate their sexual satisfaction on a scale of 0–5 as proposed by Kim and Paick and quality of life was assessed by Short Form-36 Health Survey.

In the study, a total of 912 pregnant women and their husbands were recruited. The subjects were subdivided into five groups according to their mode of delivery. The first group include women who had a spontaneous vaginal delivery without injuries, the second group had those with vaginal delivery with episiotomy or perineal laceration, the third group had an operative vaginal delivery (instrumental delivery), the fourth group underwent a planned cesarean section and the final group underwent emergency cesarean section.

The researchers concluded that in healthy women with normal singleton pregnancies at term, instrumental deliveries are associated with the highest, and planned cesarean section is associated with the lowest rate of long-term maternal and paternal sexual dysfunction.

Barbara et al. (2016) in Italy carried out a study to investigate the impact of mode of delivery on female postpartum sexual functioning by comparing spontaneous vaginal delivery, operative vaginal delivery, and cesarean section. They recruited 269 Primiparous women divided into three groups, the first who had a spontaneous vaginal delivery, the second group had an operative vaginal delivery and the final group who underwent a cesarean section. Time to resumption of sexual intercourse, postpartum depression, and current breastfeeding and postpartum sexual functioning evaluated using the Female Sexual Function Index (FSFI) were all assessed six months after childbirth. They concluded that Operative vaginal delivery might be associated with poorer sexual functioning, but they cautioned on concluding the study regarding the impact of pelvic floor trauma (perineal laceration or episiotomy) on sexual functioning because of the high rate of episiotomies. Following the above conclusion, they recommended that obstetric algorithms currently in use should be refined to decrease further the risk of operative vaginal delivery.



Other studies on the influence of mode of delivery on postpartum sexual function include those by Signorello, Harlow, Chekos, and Repke (2001) in Boston, USA, Herbison (2008) from three centers in Scotland, England, and New Zealand, and systematic reviews by Hicks, Goodall, Quattrone, Lydon-Rochelle (2004), Yeniel and Petri (2013), and Leeman and Rogers (2012).

However, the results above are contrasted with several studies from different regions that show no associations between mode of delivery and sexual health outcomes.

De Souza, Dwyer, Thomas, Ferreira, and Schierlitz (2015), carried out a prospective cohort study in Tertiary women's hospital in Melbourne, Australia involving 440 Primiparous women to determine the effect of mode of delivery and perineal injury on sexual function at six and 12 months postpartum. The Female Sexual Function Index (FSFI) completed at the first visit (7–19 weeks of gestation), and at six and 12 months postpartum was used to determine a statistically significant difference in total FSFI or domain scores over time according to the mode of delivery or perineal injury. In this cohort, the women were divided into three groups those who had a normal vaginal delivery, secondly those who had an instrumental delivery, and finally those who gave birth by cesarean section. No difference was found in total FSFI or domain scores according to the mode of delivery over time between antenatal assessment and 12 months postpartum. The study concluded that at 12 months' postpartum sexual function has returned to early pregnancy levels, irrespective of the mode of delivery or perineal injury.

Klein et al. (2009) in Austria carried out a study to evaluate the influence of the mode of delivery on female sexuality 12–18 months after childbirth. They recruited 99 Primiparous women into the study divided into two groups those who delivered

vaginally without complication and those who underwent elective cesarean section after 37 weeks of gestation. Sexual function was assessed by a validated self-reported questionnaire, the Female Sexual Function Index (FSFI) 12 months after birth, and compared between groups. Additionally, they have analyzed subjective stress variables recorded after birth between the two groups. Results showed that the total score of the FSFI was not significantly different between the groups, However, patients' recall of dyspareunia three months after childbirth was higher in those who underwent vaginal delivery. The researchers concluded that there is no significant difference in sexual function 12–18 months after childbirth between women who delivered vaginally without episiotomy, heavy perineal laceration, or secondary operative interventions and women who underwent elective cesarean section.

Ghorat, Esfehiani, Sharifzadeh, Tabarraei, and Aghahosseini (2017) carried out a cross-sectional study to determine the relationship between mode of delivery and long-term sexual function in Primipara women of Sabzevar, Iran.

A total number of 177 Primipara women were enrolled in this study and the Sexual function of mothers was determined by a validated Persian version of the Female Sexual Function Index (FSFI). The study population was divided into those who had a vaginal delivery and those who had a cesarean section. The overall FSFI score was not significantly different in women in the two groups. They concluded that the study showed that the delivery method has no long-term effect on female sexual function.

Other studies that also show no association between mode of delivery and sexual function after delivery include those by Connolly, Thorp, and Pahel (2005) in North Carolina USA, Baytur et al. (2005) in Turkey, Jorien, Hein, Pol, and Heintz (2007) in Netherlands, Pauls, Occhino, and Dryfhout (2008) in Cincinnati USA, Herbison (2008), Houseini, Iran-Pour and Safarinejad (2011) in Iran, Langrová and Vrublová.

(2013) in Czech, Faisal-cury, Menezes, Quayle, Matijasevich, and Diniz (2015) in Brazil, Abd, El, Abd, Ibrahim, Abd, and Moursi (2017) in Egypt, and also by systematic reviews by Borders (2006b), Serati et al. (2010), Leeman and Rogers (2012), and Yeniel and Petri (2013).

### **2.4.3 Perineal Injury**

Studies on the effect of perineal injury on sexual function after delivery have been carried out in several centers with conflicting findings. The injury could result from either episiotomy or perineal tears.

Rådestad, Olsson, Nissen, and Rubertsson (2008), in a population-based cohort study of 2,490 women from the Swedish Medical Birth Register identified at antenatal care. Using information about first sexual intercourse and tears one year after birth, they concluded that tears in the vagina, perineum, sphincter ani, or rectum are associated with a delay in women's resumption of sexual intercourse six months after childbirth. Signorello et al. (2001) in Boston, USA, carried out a retrospective cohort study in three groups of Primiparous women after vaginal birth. First with intact perineum or a first-degree perineal tear, the second with second-degree perineal trauma, and the final group with third- or fourth-degree perineal trauma. The outcome of the study was time to resumption of sexual intercourse, dyspareunia, sexual satisfaction, sexual sensation, and the likelihood of achieving orgasm.

They concluded that women whose infants were delivered over intact perineum reported the best outcomes overall, whereas perineal trauma and the use of obstetric instrumentation were factors related to the frequency or severity of postpartum dyspareunia, indicating that it is important to minimize the extent of perineal damage incurred during childbirth.

Fodstad et al. (2016) in Norway carried out a study to investigate self-reported sexual activity and coital problems one year postpartum any association to perineal trauma and delivery mode.

They recruited 2,846 women during pregnancy, all women who delivered with obstetric anal sphincter injury (All third-degree perineal tears), in addition to randomly selected controls per obstetric anal sphincter injury case, a total of 882 women, were sent a self-administered questionnaire addressing time to coital resumption after delivery and potential coital difficulty one year postpartum.

Obstetric anal sphincter injury was the strongest predictor for postponed coital onset and was also the only significant predictor for dyspareunia one year after delivery. Episiotomy was neither a risk factor for postponed coital onset nor dyspareunia. There were no differences between episiotomy and second-degree laceration injury groups regarding the postponed coital onset or dyspareunia one year postpartum.

Their conclusions were obstetric anal sphincter injury was a strong and independent predictor for both postponed coital resumptions after delivery and dyspareunia one year postpartum, whereas episiotomy and spontaneous second-degree lacerations were not. They recommended that their main finding of affected sexual activity after obstetric anal sphincter injury further supports the need to reduce the rates of this obstetric injury to a minimum.

These findings have been confirmed in several studies that report that pelvic floor trauma (perineal laceration or episiotomy) significantly increased the risk of Dyspareunia in the postpartum period. Some of these studies include those by Klein et al. (1994) in Canada, Mous et al. (2007) in the Netherlands, Herbison (2008) in three centers Scotland, England, and New Zealand, Rogers et al. (2008) in New Mexico USA, systematic reviews Sydow (1999) and Leeman and Rogers (2012).

However, the above findings are in contrast to numerous studies that show no association between perineal injury and sexual function after delivery. These studies include those by Connolly et al. (2005) in North Carolina USA, Serati et al. (2008) in Italy, Klein et al. (2009) in Vienna Austria, Souza et al. (2015) in Australia, Barbara et al. (2016) in Italy, and systematic reviews by Serati et al. (2010) and Yeniei & Petri (2013) who found no long term impact of pelvic floor trauma (perineal laceration or episiotomy) on postpartum sexual functioning.

#### **2.4.4 Breastfeeding Pattern**

Breastfeeding is a significant component of the life of many new mothers and has been speculated and studied to assess its influence on sexual function after delivery.

Avery, Duckett, and Frantzich (2000) from Minnesota, USA described various aspects of the sexuality of breastfeeding women. The investigators used a descriptive design to analyze data from the 576 Primiparous breastfeeding women who, as part of a larger study, completed the Breastfeeding and Sexuality Tool at the time of complete weaning. The data was collected by phone over 12 months.

They reported that generally women perceived breastfeeding had a slightly negative impact on the physiologic aspects of sexuality but did not greatly affect the woman's sexual relationship with her partner.

Connolly et al. (2005), conducted a study on Nulliparous women in North Carolina, the USA who were followed up to 24 weeks postpartum to evaluate the effects of pregnancy and childbirth on postpartum sexual function. They reported an association between dyspareunia and breastfeeding at 12 weeks postpartum.

Yee et al. (2013) carried out a prospective study of 160 postpartum women assessing relationships between demographic factors, mode of birth, depression, breastfeeding, and sexual activity and function. Questionnaires were administered over the telephone eight to ten weeks postpartum and in-person six to eight months postpartum. Primary outcomes were sexual activity at eight to ten weeks postpartum and global and subscale of the Sexual Health Outcomes in Women Questionnaire (SHOW-Q) scores at six to eight months postpartum. They reported that depression and breastfeeding are associated with poorer postpartum sexual functioning.

#### **2.4.5 Contraceptives Use**

Contraceptive use during the postpartum period is a critical component of postpartum care. It has been studied by several researchers to evaluate the types, prevalence of its use, and the effect if any on sexual function with conflicting findings.

Sok et al. (2016), in Utah, USA carried out a prospective study that recruited participants during prenatal visits or postpartum before hospital discharge. Women completed an initial survey regarding pregnancy intendedness, contraceptive history, breastfeeding plans, sexual activity, satisfaction, and initiation. Postpartum surveys were conducted every two weeks starting six weeks after birth until 12 weeks or return to vaginal sexual intercourse. They reported that by six weeks postpartum, four in ten women had resumed vaginal intercourse, with only half using contraception.

Butt, Lema, Mukaindo, Mohamoud, and Shabani, (2019) conducted a cross-sectional study in Kenya with a consecutive sampling of 566 women of reproductive age using either hormonal or non-hormonal contraception. They concluded that there was a high prevalence of and a strong association between hormonal contraception and female sexual dysfunction. They however recommended the need for more studies on this topic

in different settings to investigate the effect of each type of hormonal method on female sexual dysfunction.

Iiyasu, Galadanci, Danlami, Salihu, and Aliyu (2018) studied practices related to the resumption of coitus after childbirth in Nigeria using a cross-section of 317 women attending immunization, postnatal, and family planning clinics within 12 months of childbirth. They examined factors associated with sexual intercourse, delivery-coitus interval, and contraceptive use among postpartum women. They reported that most women resumed sexual intercourse within two months of delivery, but only two-thirds used modern contraceptive methods. The contraceptive use was predicted by educational status, sexual activity, baby 's age, and menstruation.

#### **2.4.6 Psychological, Social, and Relational Factors**

Hipp, Kane Low, and Van Anders (2012), in Michigan, USA, carried out a retrospective study involving 304 women assessed via an online questionnaire on the first three months postpartum, with the main outcome measures being retrospective reports of sexual desire (Sexual Desire Inventory), latency to the resumption of sexual activity, and perceptions of partner's sexual desire. Other measures were birth experience (Questionnaire Measuring Attitudes About Labor and Delivery), breastfeeding status, perceptions of social support (Multidimensional Scale of Perceived Social Support), stress (Perceived Stress Scale), and body image (Body Image Self-Consciousness Scale).

They reported that postpartum desire was not significantly influenced by breastfeeding status, vaginal issues, or psychosocial variables including stress, body image, or social support. They concluded that postpartum sexuality is a multidimensional phenomenon and that a woman's perceptions of their partner's sexuality impact postpartum sexuality more than the physical factors most commonly studied (e.g., vaginal trauma and

breastfeeding). They further highlighted the need for more research to address its social context.

Faisal-Cury, Huang, and Menezes (2013) in a prospective cohort study of 831 pregnant women in São Paulo, Brazil. This was conducted on four groups of women with depressive/anxiety symptoms (DAS) during antenatal and postpartum periods identified using the Self Report Questionnaire (SRQ-20): The first group included those with the absence of both antenatal and postpartum DAS, the second group being the presence of antenatal DAS only, the third group being the presence of postpartum DAS only and the final group had the presence of both antenatal and postpartum DAS. The primary outcome was the perception of sexual life decline (SLD) before and after pregnancy/delivery. They concluded that postpartum women with depressive/anxiety symptoms have an increased likelihood of sexual life decline up to 18 months after delivery. They further pointed out that those efforts to improve the rates of recognition and treatment of perinatal depression/anxiety in primary care settings have the potential to preserve sexual functioning for low-income mothers.

Pauls, Occhino, and Dryfhout (2008) prospectively assessed the effects of pregnancy on sexual function and explored causative factors for sexual function alterations such as body image and pelvic floor symptoms. In the study, pregnant women completed the questionnaires in the first and third trimesters and at six months postpartum. These included general information, questions regarding sexual activity and practices, and five validated indices: The Female Sexual Function Index (FSFI), the Body Exposure during Sexual Activities Questionnaire, short forms of Urogenital Distress Inventory and Incontinence Impact Questionnaire, and the Fecal Incontinence Quality of Life Scale.



Their results showed that although body image during sexual functioning did not significantly change during pregnancy, it worsened in the postpartum period. In early pregnancy, low sexual function was associated with impaired body image, while in the postpartum period, worse urinary symptoms correlated with poor FSFI. They concluded that Sexual function worsens during pregnancy and is not recovered by six months postpartum; poor scores may be attributable to low body image and urinary complaints.

#### **2.4.7 Co-Morbid Conditions**

Andreucci et al. (2015) carried out a systematic review on aspects of women's sexual life after maternal morbidity and/or maternal near miss, during different periods after delivery. Their search included studies published from 1995 to 2015 with maternal morbidity as exposure split into general or severe/near miss. Female sexual outcomes evaluated were dyspareunia, Female Sexual Function Index (FSFI) scores, and time to resume sexual activity after childbirth. They concluded that investigation of long-term repercussions on women's sexual life aspects after maternal morbidity has been scarcely performed, however indicating worse outcomes for those experiencing morbidity. They further recommended that further standardized evaluation of these conditions among maternal morbidity survivors may provide relevant information for clinical follow-up and reproductive planning for women.

#### **2.4.8 Neuro-Endocrine Profiles**

Rupp et al. (2013), carried out a study to measure amygdala activation using functional Magnetic resonance imaging (fMRI) in response to sexually arousing pictures, infant pictures, and neutral pictures in 29 postpartum and 30 nulliparous women. Half of the women received a dose of exogenous oxytocin before scanning. This is to better understand the phenomena in the postpartum period that women experience significant

changes in their neuroendocrine profiles and social behavior compared to before pregnancy and that motherhood portends a decrease in sexual desire.

They reported that nulliparous women subjectively rated sexual pictures to be more arousing, and infant pictures to be less arousing, than did postpartum women. However, nulliparous women receiving the nasal oxytocin spray rated the infant photos as arousing as did postpartum women. Right amygdala activation was lower in postpartum versus nulliparous women in response to sexual, infant, and neutral images, suggesting a generalized decrease in right amygdala responsiveness to arousing images with parturition. There was no difference in right amygdala activation with nasal spray application. They concluded that postpartum women appeared to experience a decrease in sexual interest possibly as a feature of a more generalized decrease in amygdala responsiveness to arousing stimuli.

The results from the above studies show postpartum sexual dysfunction as a multidimensional phenomenon influenced by several factors with conflicting results about the type of factors and the extent of their influence. There is however a dearth of data on this area on our local population.

## **2.5 Management of Postpartum Sexual Dysfunction**

Offering care to those found to have various forms of postpartum sexual concerns, problems or dysfunction is an integral part of comprehensive postpartum care.

De Souza et al. (2015) reported that most of these problems resolve with a return of the sexual function to early pregnancy levels after about a year. While a majority of these sexual health concerns or problems are transitory some require prompt treatment to avoid unnecessary morbidity.

Multidisciplinary care has been proposed in the emerging field of Sexo-perinatology a branch of sexology that focuses on the management of sexual health in the peripartum period (de Pierrepont, Polomeno, Bouchard & Reissing, 2016a; de Pierrepont, Polomeno, Bouchard & Reissing, 2016b).

The above care involves several approaches to address the various sexual health concerns or problems. This involves education, counseling, and therapy (ECT). Education could include the provision of information on the transient nature of most of the sexual health concerns or problems experienced during this period, while Counseling involves the use of different techniques like anticipatory counseling (Johnson, 2011) and finally, Therapy/Treatment incorporates diverse methods from the use of medication (Analgesia, Vaginal lubricants) to the use of therapy models like the “Permission, Limited Information, Specific Suggestions, and Intensive Therapy” (PLISSIT) model and novel support system like Women's Postpartum Sexual Health Program (McBride, Olson, Kwee, Klein & Smith, 2016).

The opportunity to seek care for the above concerns or problems is during postnatal clinic or when the new mother identifies concerns or problems and seeks specialist attention. However considering that most women rarely seek care for these sexual problems (McDonald, Woolhouse & Brown, 2015), sexual health education during the ante and postnatal clinic becomes very important. This could include the provision of information on the types of postpartum sexual health concerns or problems, the transitory nature of most of them, available management options for persistent ones, and the knowledge that they can freely talk to healthcare providers about sexual health.

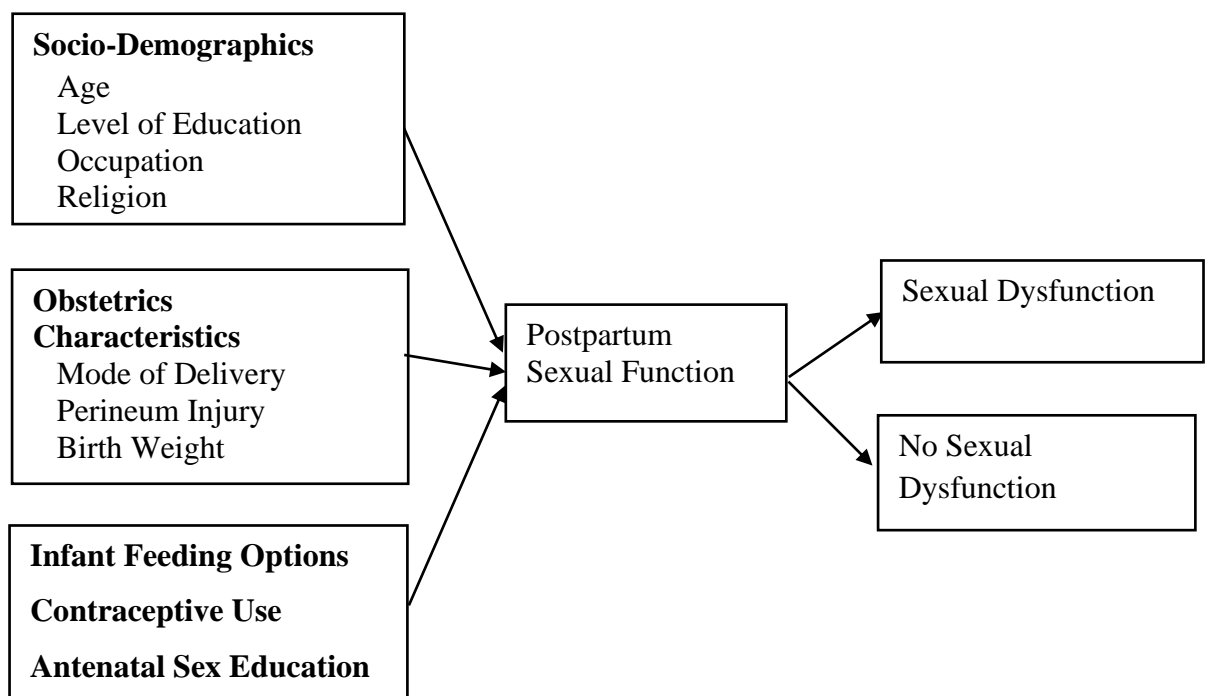
In Kenya, the main guide during these clinic visits is the Ministry of Health, Mother and Child Health Booklet, MOH 216 (Ministry of Health, 2013).

This forty-page document includes numerous pieces of advice on various aspects of postnatal care: Nutrition, breastfeeding, danger signs, reproductive organ cancer screening, family planning, and child health monitoring, however, it only includes a single piece of advice on sexual health after delivery under the topic: Father’s Support for mother and child health after birth “. ...Avoid sexual contact until the bleeding and the discharge that comes after delivery stops.....” This limited focus on sexual health education during the ante and postnatal clinics represent a missed opportunity to discuss a potentially significant problem (Woolhouse, McDonald & Brown, 2014).

## 2.6 Conceptual Framework

### Independent Variables

### Dependent Variable



**Figure 3: Conceptual Framework**

## CHAPTER THREE

### 3.0 METHODS

#### 3.1 Study Setting

The study was conducted in the labor and postnatal ward at Riley Mother and Baby unit and Postnatal-Well Baby Clinic in the Pediatrics Shoe 4 Africa unit at Moi Teaching and Referral Hospital (MTRH).

MTRH is the largest hospital in western Kenya and the second largest referral hospital in Kenya. Located in Eldoret town and serves part of the Great Rift Valley and counties in western Kenya. It also serves part of the Republics of Uganda and Southern Sudan. The catchment area has 15 to 20 million people. The hospital has been the teaching hospital for Moi University School of Medicine since its inception. It serves as a training center for undergraduate, postgraduate, and fellowship-program students of the school of medicine. It also offers training for various diplomas for students at Kenya Medical Training College.

MTRH is made up of the main hospital and a private (Memorial) wing. It offers services to an average of 1200 inpatients at any time and about 1500 outpatients per day. It doubles both as primary care and referral facility offering subspecialty care.

Obstetrics care is offered at Riley Mother and Baby Unit of the hospital. The unit is one of the specialty and subspecialist departments in the hospital. It's composed of a Triage and Emergency area where patients are first seen. From here patients can either be discharged for outpatient follow-up or admitted to one of five units: labor ward, antenatal ward (with maternal-fetal subspecialist unit), postnatal ward, hostel, and labor ward theatre. The labor ward is a five-roomed fifteen-bed capacity unit, the staff at any given time includes one consultant obstetrician, three residents, and eight midwives.

Each midwife in every delivery room is in charge of monitoring three women in labor at any given time. After delivery women with uneventful vaginal delivery or with babies in the newborn unit are admitted to the hostel unit from where they can be allowed home. Those who have had a cesarean delivery, or vaginal delivery with complications or comorbidities are admitted to the postnatal ward for further care and observation. According to the hospital's department of health records and information services, the unit conducted 133 304 deliveries in the year 2019 of these 5 477 deliveries occurred in Primiparous women.

Post-natal care after discharge from the ward is offered as an outpatient in the postnatal clinic within the Pediatrics Shoe 4 Africa unit of the hospital as part of integrated mother-baby care.

### **3.2 Study Design**

The study was a prospective cohort study carried out at MTRH from July 2019 to August 2020 with respondents followed up for one year from the date of delivery at five intervals. These intervals coincided with the infant vaccination schedule.

### **3.3 Study Population**

The study population was Primiparous women who delivered at MTRH Riley Mother and Baby Unit and met the eligibility criteria.

### **3.4 Eligibility Criteria**

#### **3.4.1 Inclusion Criteria**

1. Above 18 years of age.
2. Understands English (spoken and written).
3. Had a live birth.
4. Married.
5. Able to attend the postnatal clinic at MTRH.

#### **3.4.2 Exclusion Criteria**

1. Preterm delivery at less than 37+0 weeks' gestation.

### 3.5 Sample Size Determination

The study aimed to assess the burden of sexual dysfunction among Primiparous women who deliver at MTRH. Khajehei et al. (2015) showed that 70.5% of postpartum Australian women experienced sexual dysfunction during the previous 12 months following delivery. To be 95% confident to report this proportion within plus or minus 5%. The sample size was determined using the formula for sample size estimation for longitudinal studies (Hedeker, Gibbons & Waternaux, 1999).

$$\begin{aligned}
 n &= \left( \frac{Z_{1-\frac{\alpha}{2}}}{d} \right)^2 \times P \times (1 - P) \times \frac{(1 + (m - 1) \times \rho)}{m} \\
 &= \left( \frac{1.96}{0.05} \right)^2 \times 0.7 \times (1 - 0.7) \times \frac{(1 + (5 - 1) \times 0.25)}{5} \\
 &= 130
 \end{aligned}$$

Where:

$Z_{1-\frac{\alpha}{2}}$  is the quantile of the standard normal distribution corresponding to  $(1 - \frac{\alpha}{2}) \times 100\%$  percentile.

$\alpha$  is the type I error.

$d$  is the margin of error.

$P$  is the proportion who experience sexual dysfunction.

$m$  is the number of time points where data will be collected.

$\rho$  being the intra-class correlation.

Adjusting for a potential dropout rate of 10% as reported by (Woolhouse et al., 2014).

$$n/1 - r = 130/1 - 0.9 = 144$$

Where:

$r = 0.1$  is the dropout rate at 12 months.

Sampling was done from a finite population of approximately 300 Primiparous women per month. This would need an accrual period of three months to recruit all the respondents hence the population to sample from will be 900. Correcting for this gives 125 as the number to sample.

$$\frac{n}{1+n/N} = \frac{144}{1+144/900} = 125$$

### **3.6 Sampling**

The labor ward delivery record was used to identify Primiparous women who meet the eligibility criteria. They were then systematically sampled following the order in which they delivered. The first respondent was selected by a simple random sampling method from a list of eligible mothers on the first day of recruitment. Subsequently the sampling interval was  $k = N/n = 900 / 125 \approx 7$ . Every seventh woman was sampled day and night by a trained research assistant until the required sample size was attained.

### **3.7 Study Procedure**

#### **3.7.1 Data Collection**

Primiparous women in the labor ward, postnatal ward, or hostel were approached by the principal investigator or trained research assistant, an explanation about the study procedure given, those who met the eligibility criteria and provided consent were enrolled in the study (Appendix I). The research assistant, a registered clinical officer, was trained on the research protocol and involved during the recruitment in the wards and follow-up at the clinic. This research assistant was not involved in offering clinical care to the respondents during their postpartum follow-up visits. The enrolment was during July and August 2019.

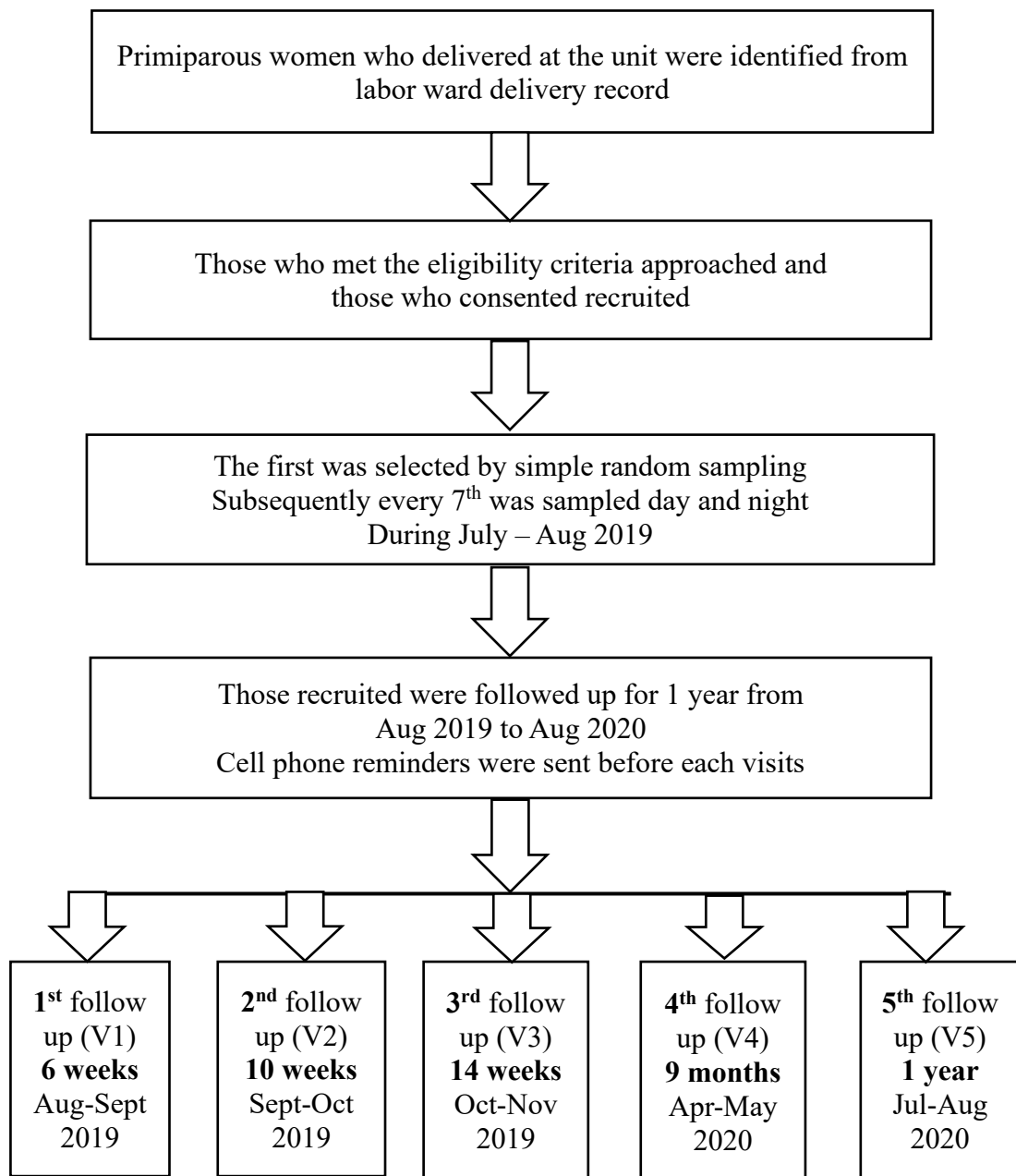
At enrolment data on socio-demographic characteristics and whether any sexual health education was received during the antenatal clinic was collected from the respondents



using a structured questionnaire while obstetrics characteristics were abstracted from the respondent's medical chart (Appendix II, Section 1-4).

Respondents were followed up over one year (July 2019 to August 2020) at five intervals (six, ten, fourteen weeks then at nine and twelve months these coincided with the infant's vaccination schedule). At every follow-up, interval data was collected using two questionnaires: The first being an interviewer-administered questionnaire to determine the following three components: The duration to the resumption of sexual intercourse after delivery, Infant feeding options, and Contraceptive use (Appendix II, Section 5-6). The second was a self-administered Female Sexual Function Index (Appendix II, Section 7).

To reduce loss to follow-up, contact information (phone numbers) of respondents and their preferred next of kin was recorded at recruitment to aid in sending reminders in the form of text messages and a phone call before each of the five follow-up intervals (Figure 4).



**Figure 4: Study Procedure**

### **3.7.2 FSFI Tool**

The FSFI is a validated questionnaire whose reliability has been reported in many studies (Burri, Cherkas & Spector, 2010; Meston & Derogatis, 2002). The FSFI questionnaire consists of 19 multiple-choice questions, and it was designed to collect data on female sexual functioning in the past four weeks. Six main domains of sexual function desire, arousal, lubrication, orgasm, satisfaction, and pain are assessed. The items are scored using a Likert scale. Questions 1, 2, 15, and 16 were scored by five-point from 1 to 5. The other questions had a six-point Likert scale from 0 to 5.

The item score is computed for the six domains of sexual function including desire, arousal, lubrication, orgasm, satisfaction, and pain. Then, each domain score was multiplied by a relative factor to calculate rates for domains of sexual dysfunction. The score of the domain of “desire” ranged from 1.2 to 6. For the other five domains, the scores ranged from 0 to 6 (Appendix III).

If the participant acquires domain scores less than 4.28 on desire, 5.08 on arousal, 5.45 on lubrication, 5.05 on orgasm, 5.04 on satisfaction, and 5.51 on pain, they were classified as having difficulties in that domain. To calculate the total score the domains’ scores computed above are summed up and a cut-off score of 26 or less was used to identify women with sexual dysfunction (Wiegel, Meston & Rosen, 2016).

### **3.7.3 Pretesting of FSFI Tool**

Cognitive assessment was carried out in the postnatal clinic on 12 Primiparous women coming for follow-up after delivery. All had secondary education or higher, six had a vaginal delivery, and the other six had cesarean deliveries. They were asked to read and fill in the FSFI tool (Appendix II, Section 7) and then comment on the tool. They all found the tool easy to read, understand and fill in.

### **3.8 Research Variable**

#### **3.8.1 Independent Variables**

The Independent variables divide into five groups including Socio-demographics characteristics (Age, Highest education level, Occupation, Religion), Obstetrics characteristics (Mode of delivery, Nature of perineum at delivery, Birth weight in grams), Contraceptive use, Infant feeding options (Exclusive breastfeeding i.e. Breast milk only, Mixed feeding i.e. Breast milk and other feeds and Feeds only) and Antenatal sex education (Appendix IV).

Mode of delivery was subcategorized into Spontaneous vaginal delivery, assisted vaginal delivery (Using a Vacuum device), Emergency Caesarean delivery, and Elective Caesarean delivery.

The nature of the perineum at delivery for those who had vaginal delivery was grouped into three Intact, Episiotomy, or Perineal laceration (First, second, third, or fourth-degree laceration). Perineal trauma was recorded in the patient charts by the midwife who attended to the delivery.

#### **3.8.2 Dependent Variables**

The dependent variable is Postpartum Sexual Function divided into dysfunction or no dysfunction as assessed by the FSFI questionnaire using both total and domain scores (Appendix IV). A FSFI total score of 26 or less was used to identify women with sexual dysfunction.

While a FSFI domain scores less than 4.28 on desire, 5.08 on arousal, 5.45 on lubrication, 5.05 on orgasm, 5.04 on satisfaction, and 5.51 on pain, they were classified as having difficulties (Dysfunction) in that domain.

### **3.9 Data Analysis**

The data was collected using questionnaires identified by serial numbers to maintain patients' privacy. The data collection forms were verified for completeness by a trained research assistant at the end of each day. The data was entered and cleaned on the Microsoft office access 2007 electronic database. It was then analyzed using the R Foundation for Statistical Computing Platform (R Core Team, 2014).

The data was summarized using frequency and percentages for categorical variables such as age, religion, residence, ethnicity, occupation, education level, birth weight, infant feeding options, contraceptive use, and proportions with Sexual dysfunction at every study interval.

Measures of central tendency and dispersion using either mean and standard deviation or median and interquartile range were used to summarize continuous variables such as gestational age and duration to resumption of sexual intercourse.

Bivariate analysis was carried out using Fisher's exact test for categorical variables with a P-value of 0.05. A multivariable logistic regression analysis was further carried out for variables with a p-value of 0.25 or less at bivariate analysis and those variables of clinical importance from the literature review.

### **3.10 Ethical Considerations**

Ethical approval to conduct the study was sought from the Institutional Research and Ethics Committee (IREC) at Moi University School of Medicine (Appendix VII and VIII). While permission to conduct research was provided by the Chief Executive Officer- Moi Teaching and Referral Hospital (Appendix IX).

Informed consent was obtained from all the study respondents (Appendix I). Only individuals who freely consented were allowed to participate in the study, in addition, they were informed of the right to withdraw at any point during the study. The respondents were further informed that they could decline to answer any question at any time they wished during the interview process for any reason without fear of jeopardizing the care they were receiving.

To maintain confidentiality, respondents' names were not used in the study instead the use of serial numbers ensured anonymity. All questionnaires were kept in a locked file cabinet while the electronic database was stored in a password-protected portable hard drive to limit access to the investigator and the two university supervisors.

The respondents were compensated with two hundred Kenyan shillings to cater for transport to the facility for every visit. This amount is comparable to routine public transport cost within Eldoret town.

### **3.11 Data Dissemination**

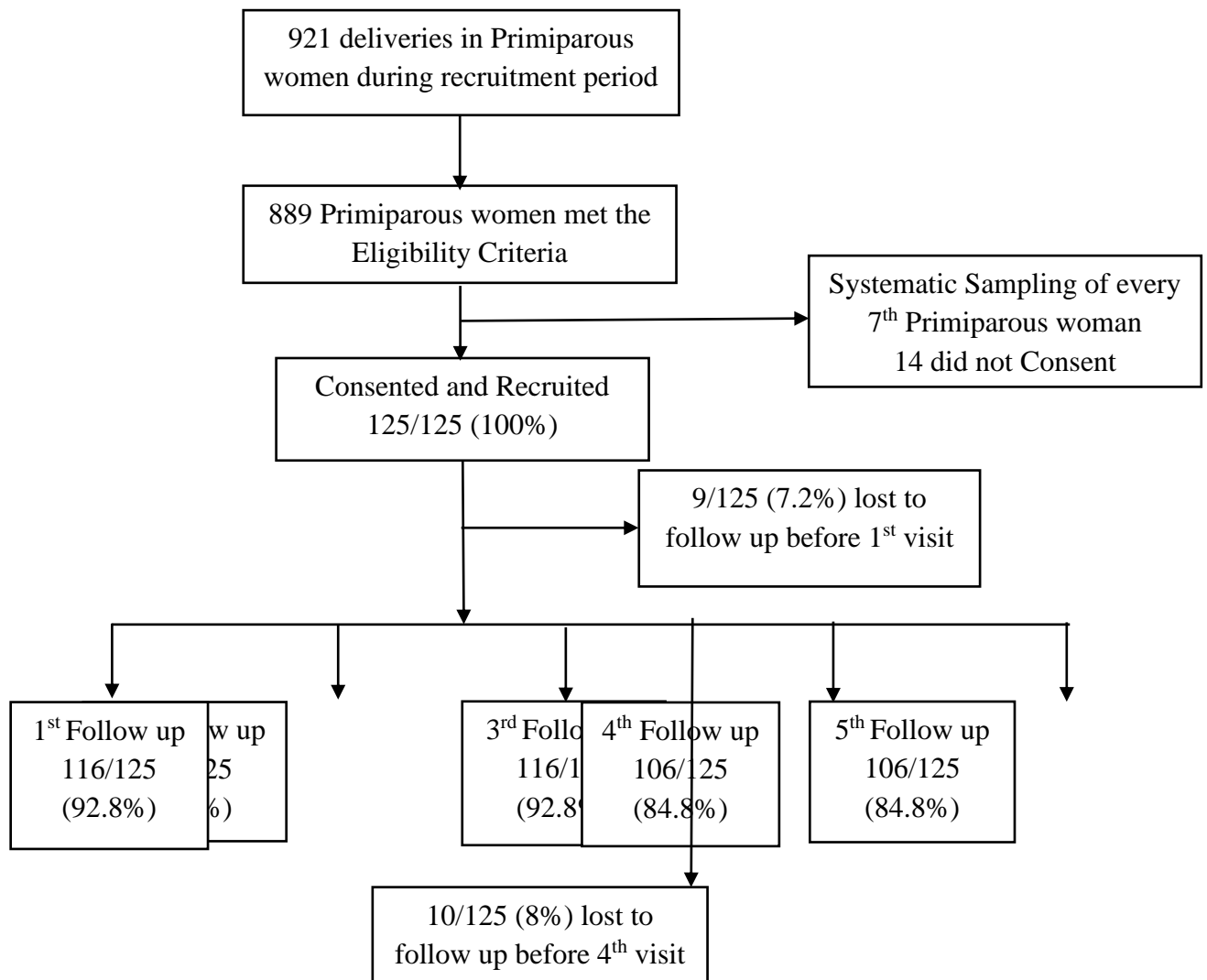
The study findings were prepared in a thesis document and a copy will be submitted to the university library for public use and reference. They will also be published in a reputable journal for wider circulation and will be present in local/international scientific meetings, continuous medical education forums for both healthcare providers and patients.

## CHAPTER FOUR

### 4.0 RESULTS

#### 4.1 Study Flow

Of the 125 respondents recruited into the study, 19 were lost to follow-up. This gave a loss to follow-up rate was 15.2% (19/125). The reasons given by nine respondents lost to follow up before the first visit at six weeks were: Two moved out of town, two declined to continue with study and five had their phones offline/not going through. Of the 10 respondents lost to follow-up before the fourth visit at nine months: Two were pregnant while eight had their phones offline/not going through (Figure 4).



**Figure 5: Study Flow Chart**

## 4.2 Characteristics of the Respondents

### 4.2.1 Socio-Demographic Characteristics

The median age of all the 125 respondents was 23.0 years (IQR: 22-25) with a range of 19.0 to 43.0 years, majority 68.0% (85/125) were 24 years or less, 69.6% (87/125) had university/college education, 67.2% (84/125) had no Occupation, 96.0% (120/125) lived within Uasin Gishu county, 99.2% (124/125) reported being Christian and 61.6% (77/125) were of Kalenjin ethnicity (Table 1).

**Table 1: Socio-Demographic Characteristics of the Respondents**

Variable	(N=125)
	n (% of Respondents)
<b>Age (Years)</b>	
≤ 24	85 (68.0%)
25-30	32 (25.6%)
>30	8 (6.4%)
<b>Education Level</b>	
Secondary	38 (30.4%)
University/College	87 (69.6%)
<b>Occupation</b>	
Formal	17 (13.6%)
Self employed	24 (19.2%)
None	84 (67.2%)
<b>Residence</b>	
Bomet	1 (0.8%)
Elgeyo Marakwet	1 (0.8%)
Nandi	3 (2.4%)
Uasin Gishu	120 (96.0%)
<b>Religion</b>	
Islam	1 (0.8%)
Christian	124 (99.2%)
<b>Ethnicity</b>	
Giriama	1 (0.8%)
Maasai	1 (0.8%)
Kisii	2 (1.6%)
Luo	4 (3.2%)
Kamba	5 (4.0%)
Luhya	16 (12.8%)
Kikuyu	19 (15.2%)
Kalenjin	77 (61.6%)



#### 4.2.2 Obstetric Characteristics and Antenatal Sex Education

Of the 125 respondents, the median gestation age at delivery was 40 weeks (IQR:39.0-41.0) with a range of 37.0 to 44.0 weeks, majority 79.2% (99/125) had a spontaneous vaginal delivery, the median birth weight was 3200 grams (IQR:2900-3300) with a range of 1500 to 4300 grams, majority 91.2% (114/125) had more than 2500 grams and 52.5% (52/125) had Intact perineum. Finally, 20.0% (25/125) reported having received sexual health education during their antenatal visit (Table 2).

**Table 2: Obstetric Characteristics and Antenatal Sex Education**

Variable	(N=125) n (% of Respondents)
<b>Mode of Delivery</b>	
Emergency CD*	26 (20.8%)
Spontaneous	99 (79.2%)
<b>Nature of Perineum</b>	
NA †	26
1 <sup>st</sup> -degree laceration	26 (26.3%)
2 <sup>nd</sup> -degree laceration	10 (10.1%)
3 <sup>rd</sup> -degree laceration	2 (2.0%)
Episiotomy	9 (9.1%)
Intact	52 (52.5%)
<b>Birth Weight (grams)</b>	
≤ 2500	11 (8.8%)
>2500	114 (91.2%)
<b>Gestation Age (weeks)</b>	
Median	40.0
IQR‡	39.0, 41.0
<b>Antenatal Sex Education</b>	
Yes	25 (20.0%)
No	100 (80.0%)

Note:

\*CD=Caesarean Delivery

† NA =Not applicable (Underwent Caesarean Delivery)

‡ IQR=Interquartile Range

### 4.2.3 Infant Feeding Options and Contraceptive Use

The proportion during the first, second, third, fourth and fifth follow up visits of those practicing exclusive breastfeeding was 116/116 (100.0%), 116/116 (100.0%), 116/116 (100.0%), 1/106 (0.9%) and 0/106 (0.0%) respectively and using a contraceptive method was 19/116 (16.4%), 24/116 (20.7%), 27/116 (23.7%), 33/106 (31.1%) and 33/106 (31.1%) respectively. On the final visit, 100.0% (106/106) reported practicing mixed infant feeding and 31.1% (33/106) used a mode of contraceptive with the most common method being Implanon used by 24.2% (8/33) of the respondents (Table 3).

**Table 3: Infant Feeding Options and Contraceptive Use Over Time**

Variable		Visit 1	Visit 2	Visit 3	Visit 4	Visit 5
		N=116	N=116	N=116	N=106	N=106
<b>n (% of Respondents)</b>						
<b>Infant Feeding Options</b>	Exclusive	116 (100.0%)	116 (100.0%)	116 (100.0%)	1 (0.9%)	0 (0.0%)
	Mixed	0 (0.0%)	0 (0.0%)	0 (0.0%)	105 (99.1%)	106 (100.0%)
<b>Contraceptive Use</b>	Yes	19 (16.4%)	24 (20.7%)	27 (23.3%)	33 (31.1%)	33 (31.1%)
	No	97 (83.6%)	92 (79.3%)	89 (76.7%)	73 (68.9%)	73 (68.9%)
<b>Type of Contraceptive</b>	COC	1 (5.3%)	1 (4.2%)	1 (3.7%)	3 (9.1%)	3 (9.1%)
	Condom	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (9.1%)	3 (9.1%)
	Depo	11 (57.8%)	15 (62.5%)	16 (59.3%)	7 (21.2%)	7 (21.2%)
	Implanon	3 (15.8%)	2 (8.3%)	4 (14.8%)	8 (24.2%)	8 (24.2%)
	Cu IUD	1 (5.3%)	2 (8.3%)	2 (7.4%)	4 (12.1%)	4 (12.1%)
	Jadelle	3 (15.8%)	4 (16.7%)	4 (14.8%)	5 (15.2%)	5 (15.2%)
	POP	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (9.1%)	3 (9.1%)

### 4.3 Resumption of Sexual Intercourse

#### 4.3.1 Time to Resumption of Sexual Intercourse

A total of 63 women had resumed sexual intercourse by 12 months postpartum with a median time of 72 days (IQR:59.3-81.0) and a range of 43.0 to 98.0 days.

#### 4.3.2 Proportion of Sexual Intercourse Resumption by Visit

The proportion of those who resumed sexual intercourse was 1/116 (0.9%), 20/116 (17.2%), 61/116 (52.6%), 62/106 (58.5%), and 63/106 (59.4%) in the first, second, third, fourth, and fifth visits respectively (Table 4).

**Table 4: Proportion of Sexual Intercourse Resumption by Visit**

Variable	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	
	N=116	N=116	N=116	N=106	N=106	
<b>n (% of Respondents)</b>						
<b>Resumed Sexual Intercourse</b>	No	115 (99.1%)	96 (82.8%)	55 (47.4%)	44 (41.5%)	43 (40.6%)
	Yes	1 (0.9%)	20 (17.2%)	61 (52.6%)	62 (58.5%)	63 (59.4%)

### 4.4 Incidence of Sexual Dysfunction

#### 4.4.1 Proportion of Sexual Dysfunction Over Time Based on Total Score

Of those who had resumed sexual intercourse, the proportion with sexual dysfunction based on the total score was 6/20 (30.0%), 23/59 (39.0%), 18/61 (29.5%), 18/62 (29.0%) in second, third, fourth, and fifth visits respectively (Table 5).

**Table 5: Proportion of Sexual Dysfunction Over Time Based on Total Score**

Variable	Visit 2	Visit 3	Visit 4	Visit 5
	N=20	N=59 <sup>*</sup>	N=61 <sup>†</sup>	N=62 <sup>‡</sup>
<b>n (% of Respondents)</b>				
Dysfunction	6 (30.0%)	23 (39.0%)	18 (29.5%)	18 (29.0%)
No Dysfunction	14 (70.0%)	36 (61.0%)	43 (70.5%)	44 (71.0%)

Notes:

<sup>\*</sup>Of the 61 women who had resumed sexual intercourse three had incomplete FSFI tool

<sup>†</sup>Of the 62 women who had resumed sexual intercourse one had an incomplete FSFI tool

<sup>‡</sup>Of the 63 women who had resumed sexual intercourse one had an incomplete FSFI tool

#### 4.4.2 Proportion of Sexual Dysfunction Over Time Based on Domain Score

On the final visit at one year, the proportion of those with sexual dysfunction based on domain score was 29/62 (46.8%) had pain disorder, 33/62 (53.2%) desire disorder, 36/62 (58.1%) sexual dissatisfaction, 40/62 (64.5%) orgasmic problems, 49/62 (79.0%) arousal disorder and 56/62 (90.3%) lubrication difficulty (Table 6; Figure 6).

**Table 6: Proportion of Sexual Dysfunction Over Time Based on Domain Score**

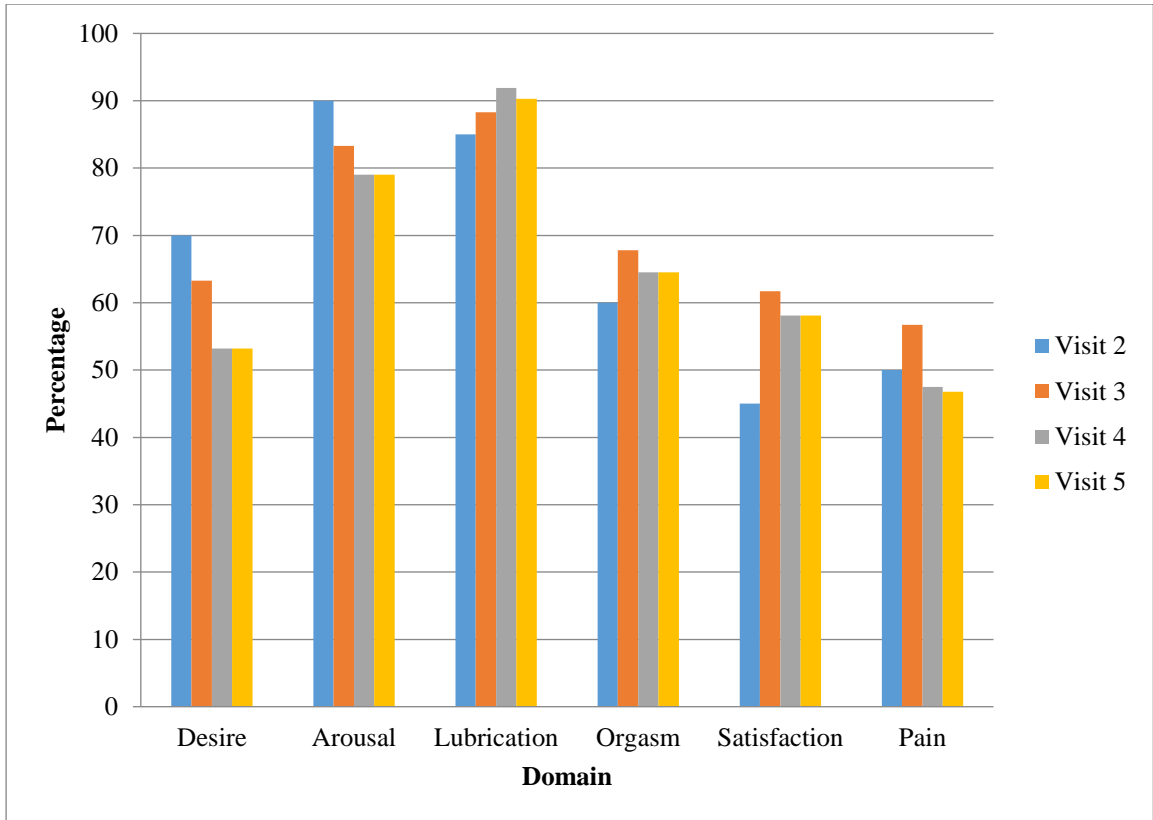
Domain		Visit 2	Visit 3	Visit 4	Visit 5
		N=20	N=60 <sup>†</sup>	N=62	N=62 <sup>‡</sup>
		n (% of Respondents)			
Desire	Dysfunction	14 (70.0%)	38 (63.3%)	33 (53.2%)	33 (53.2%)
	No Dysfunction	6 (30.0%)	22 (36.7%)	29 (46.8%)	29 (46.8%)
Arousal	Dysfunction	18 (90.0%)	50 (83.3%)	49 (79.0%)	49 (79.0%)
	No Dysfunction	2 (10.0%)	10 (16.7%)	13 (21.0%)	13 (21.0%)
Lubrication	Dysfunction	17 (85.0%)	53 (88.3%)	57 (91.9%)	56 (90.3%)
	No Dysfunction	3 (15.0%)	7 (11.7%)	5 (8.1%)	6 (9.7%)
Orgasm	Dysfunction	12 (60.0%)	40 (67.8%)*	40 (64.5%)	40 (64.5%)
	No Dysfunction	8 (40.0%)	19 (32.2%)*	22 (35.5%)	22 (35.5%)
Satisfaction	Not satisfied	9 (45.0%)	37 (61.7%)	36 (58.1%)	36 (58.1%)
	Satisfied	11 (55.0%)	23 (38.3%)	26 (41.9%)	26 (41.9%)
Pain	Yes	10 (50.0%)	34 (56.7%)	29 (47.5%)*	29 (46.8%)
	No	10 (50.0%)	26 (43.3%)	32 (52.5%)*	33 (53.2%)

Notes:

<sup>†</sup> Of the 61 women who had resumed sexual intercourse one had an incomplete FSFI tool

<sup>‡</sup> Of the 63 women who had resumed sexual intercourse one had an incomplete FSFI tool

\*One respondent had an incomplete FSFI tool on the specific sexual function domain marked



**Figure 6: Proportion of Sexual Dysfunction Based on Domain Score by Visits**

## 4.5 Factors Associated with Sexual Dysfunction

### 4.5.1 Bivariate Analysis of Factors Associated with Sexual Dysfunction at 12 Months Postpartum

Of the eight factors analyzed including three socio-demographic factors (Age, education level, and occupation) and five clinical factors (Mode of delivery, nature of Perineum, birth weight, antenatal sex education, and contraceptive use) none was significantly associated with sexual dysfunction at 12 months postpartum (Table 7).

**Table 7: Bivariate Analysis of Factors Associated with Sexual Dysfunction at 12 Months Postpartum**

Variable	Dysfunction (N=18)	No Dysfunction (N=44)	p-value*
	n (% of Respondents)		
<b>Age (Years)</b>			0.060
	≤ 24	13 (30.2%)	30 (69.8%)
	>24	5 (26.3%)	14 (73.7%)
<b>Education Level</b>			0.390
	Secondary	8 (36.4%)	14 (63.6%)
	University/College	10 (25.0%)	30 (75.0%)
<b>Occupation</b>			0.778
	Formal/self	6 (26.1%)	17 (73.9%)
	None	12 (30.8%)	27 (69.2%)
<b>Religion</b>			-
	Christian	18 (29.0%)	44 (71.0%)
<b>Mode of Delivery</b>			1.000
	Emergency CD	4 (26.7%)	11 (73.3%)
	Spontaneous	14 (29.8%)	33 (70.2%)
<b>Nature of Perineum</b>			0.087
	Injury†	8 (44.4%)	6 (55.6%)
	No Injury	10 (22.7%)	34 (77.3%)
<b>Birth Weight (grams)</b>			0.344
	≤ 2500	3 (50.0%)	3 (50.0%)
	>2500	15 (26.8%)	41 (73.2%)
<b>Antenatal Sex Education</b>			1.000
	No	13 (29.5%)	31 (70.5%)
	Yes	5 (27.8%)	13 (72.2%)
<b>Contraceptive Use (visit 5)</b>			0.266
	No	11 (36.7%)	19 (63.3%)
	Yes	7 (21.9%)	25 (78.1%)
<b>Infant Feeding Options (visit 5)</b>			-
	Mixed Feed	18 (29.0%)	44 (71.0%)

Notes:

\*Significance is at  $p \leq 0.05$

†Injury includes perineal Lacerations and Episiotomy

#### 4.5.2 Multivariable Logistic Regression of Factors Associated with Sexual Dysfunction at 12 Months Postpartum

Adjusting for age, education, birth weight, and contraceptive use, those with a perineal injury had a higher odds of experiencing sexual dysfunction (AOR: 5.70, 95% CI:1.41-28.50),  $p = 0.02$ , and the association was statistically significant (Table 8).

**Table 8: Multivariable Logistic Regression of Factors Associated with Sexual Dysfunction at 12 Months Postpartum**

Variable	AOR <sup>‡</sup>	95% CI	p-value*
<b>Age (Years)</b>			
≤ 24	1		0.900
>24	1.09	0.27, 4.15	
<b>Education Level</b>			
Secondary	1		0.200
University/College	0.40	0.10, 1.47	
<b>Nature of Perineum</b>			
No Injury	1		<b>0.020</b>
Injury <sup>†</sup>	5.70	1.41, 28.5	
<b>Birth Weight (grams)</b>			
≤ 2500	1		0.130
>2500	0.23	0.03, 1.59	
<b>Contraceptive Use</b>			
No	1		0.130
Yes	0.36	0.09, 1.28	

Notes:

\* Significance is at  $p \leq 0.05$

<sup>†</sup>Injury includes perineal Lacerations and Episiotomy

<sup>‡</sup>AOR=Adjusted Odds Ratio

## CHAPTER FIVE

### 5.0 DISCUSSION

Many factors affect sexual function in women. Studies on the emergent concept of postpartum sexual dysfunction have been based on childbirth as a factor that affects sexual function in women. The results from these studies show varied results on resumption of sexual intercourse, the prevalence of, and factors associated with sexual dysfunction. This study prospectively evaluated the effect of first delivery on sexual function using a validated questionnaire over one year.

#### 5.1 Time to Resumption of Sexual Intercourse

In this study, 63 women had resumed sexual intercourse by 12 months with a median time to resumption of 72 days. This finding may be due to the cultural practice of postpartum abstinence common among Kalenjin, the main ethnic group in this study that requires between one to three months of abstinence after delivery.

This time to resumption is much higher than those reported in studies by Sok et al. (2016) in Utah USA, Anzaku and Mikah (2014) in Nigeria, Shirvani, Nesami, and Bavand (2010) from Iran, and Amiri et al. (2015) in Iran who reported median duration to sexual intercourse resumption of 42, 56, 57.2, 62.3 days respectively.

These results are however lower than findings in a study by Aribi et al. (2012) from Tunisia who reported 120 days. However, except for the study by Amiri et al. (2015) that had Primiparas, studies by Sok et al. (2016), Anzaku and Mikah (2014), Shirvani et al. (2010), and Aribi et al. (2012) had a mixed population of multiparas and Primiparas and may not be fully comparable to findings in this study that was composed only of Primiparas. Cultural differences in postpartum sexual expectations among the populations studied could also explain the above variation in time to resumption.



## 5.2 Proportion of Sexual Intercourse Resumption by Visit

The proportion of those who resumed sexual intercourse on the first visit at 6 weeks (1.5 months) postpartum was 1/116 (0.9%). This is much lower than those reported by Alum et al. (2015) in Uganda, Adanikin et al. (2014) in Southwest Nigeria, a review by Leeman and Rogers (2012), and that by Yeniel and Petri (2013) who reported resumption rates of 21.9%, 27.6%, 52%, and 30-70% respectively during this period.

On the second follow-up visit at 10 weeks (2.5 months), this proportion was 20/116 (17.2%) and on the third visit at 14 weeks (3.5 months), it had increased 61/116 (52.6%). These results are lower than those reported by Adanikin et al. (2014) in Southwest Nigeria, Fodstad et al. (2016) in Norway, and review by Johnson (2011) who reported 63.3%, 75.2%, and 80–93% respectively had resumed sexual intercourse at 12 weeks (3 months) postpartum.

On the fourth follow-up visit at six months, the proportion had increased to 62/106 (58.5%). This finding is lower than those by Adanikin et al. (2014) in Nigeria, a review by Serati et al. (2010), De Souza et al. (2015) in Australia, and that by Yeniel and Petri (2013) who reported rates of 70.2%, 90%, 94%, and 90–95% respectively.

On the final follow-up at one year, the proportion had increased to 63/106 (59.4%). This finding is lower than those reported by Fodstad et al. (2016) in Norway, De Souza et al. (2015) in Australia, and a review by Serati et al. (2010) who reported resumption rates of 94.7 %, 95%, and 98.2% respectively at one year postpartum.

The proportions of those who resumed sexual intercourse in this study were consistently low at every follow-up visit when compared to all the studies cited above.

This could also be explained by the cultural practice of postpartum abstinence common among Kalenjin, the main ethnic group in this study that requires between one to three months of abstinence after delivery. It could also be explained by differences in cultural expectations on postpartum sexual health in the various communities in the studies cited above.

### **5.3 The Incidence of Sexual Dysfunction**

#### **5.3.1 The Overall Score**

Using the overall score, 18/62 (29.0%) of respondents had sexual dysfunction during the final visit at one year postpartum. This proportion is higher than that in a study by Chayachinda et al. (2015) from Thailand who reported 14.9% but lower than that by Khajehei et al. (2015) from Australia who reported 64.3% during the same period.

#### **5.3.2 The Domain Score**

Using domain score on the final visit at one year, 29/62 (46.8%) reported pain disorder, 33/62 (53.2%) desire disorder, 36/62 (58.1%) sexual dissatisfaction, 40/62 (64.5%) orgasmic problems, 49/62 (79.0%) arousal disorder and 56/62 (90.3%) had lubrication difficulty.

These results are lower in all domains except in the desire domain when compared to findings by Khajehei et al. (2015) among Australian Women who reported 81.2% had sexual desire disorder, 70.5 % sexual dissatisfaction, 53.5% orgasmic problems, and 52.3% sexual arousal disorder.

The difference in the above domain and total score results could be explained by cultural differences in postpartum sexual health expectations among these three populations. It can also be explained by a difference in the study design and populations studied.

The study by Chayachinda et al. (2015) was a cohort study of Primiparous Thai women all with episiotomy interviewed by telephone while the study by Khajehei et al. (2015) was cross-sectional on Australian women of mixed parity (Primi and Multiparous) interviewed online. The difference in the mode of data collection could have influenced the responses received from the populations studied.

## **5.4 Factors Associated with Sexual Dysfunction**

### **5.4.1 Age**

Age was not significantly associated with sexual dysfunction at 12 months postpartum. This could be explained by considering that most respondents in this study were young first-time mothers (median 23.0 years) having their first postpartum sexual experience, therefore had no prior influence of delivery on their sexual function.

This result compares to a study by Nazanin, Arman, and Kourosch (2017) in Iran and systematic reviews by Serati et al. (2010) and Johnson (2011) who reported that age was not associated with women's postpartum sexual function.

The results, however, contrast studies by Klein et al. (2009) in Vienna Austria, and a review by Yenziel and Petri (2013) who all reported an association of advanced maternal age with postpartum sexual dysfunction.

### **5.4.2 Education Level**

Education level was not significantly associated with sexual dysfunction at 12 months postpartum. This could be explained by considering that all respondents in this study had secondary education or higher and may therefore have similar sexual expectations due to having similar sources of information on postpartum sexual health.

This result compares to a study by Nazanin et al. (2017) in Iran and a review by Sydow (1999) that showed education did not predict women's postpartum sexual function.

The above finding, however, contrasts with a study by Klein et al. (2009) in Vienna Austria who reported the FSFI score increased in women with more years of education.

It is also contrasted by a study by Chang et al. (2010) in Taiwan who reported a significant difference in sexual function based on educational level. However, the study by Chang et al. (2010) may not be fully comparable to this study's finding since it evaluated this association shortly after delivery (within 6 weeks).

#### **5.4.3 Occupation**

Occupation was not significantly associated with sexual dysfunction at 12 months postpartum. This could be explained by the fact that most of the respondents (67.2%) had no occupation at the time of the study and thus had no career pressure on top of other postpartum needs of the new mother that could influence her sexual experience.

The findings above compare to a study by Nazanin et al. (2017) in Iran and a systematic review by Sydow (1999) that showed family income/financial situation did not predict women's postpartum sexual function.

#### **5.4.4 Mode of Delivery**

Mode of delivery was not significantly associated with sexual dysfunction at 12 months postpartum. A possible explanation for this finding could be that most of the respondents (79.2%) had a spontaneous vaginal delivery, these women generally have faster and better postpartum recovery when compared to those who have undergone cesarean delivery.

The above finding compares to studies by Klein et al. (2009) in Austria, Houseini et al. (2011) in Iran, Langrová and Vrublová (2013) in Czech, Faisal-cury et al. (2015) in Brazil, De Souza et al. (2015) in Australia, Ghorat et al. (2017) in Iran, Abd et al. (2017)

in Egypt and also by systematic review by Serati et al. (2010) who all reported no associations between mode of delivery and postpartum sexual health outcomes.

However, this result contrasts studies by Safarinejad et al. (2009) in Iran, Barbara et al. (2016) in Italy, systematic reviews by Yenziel and Petri (2013), and that by Leeman and Rogers (2012) who reported operative vaginal delivery are associated with poor sexual health outcomes (dyspareunia and sexual dysfunction).

#### **5.4.5 Perineal Injury**

Perineal injury was significantly associated with sexual dysfunction at 12 months postpartum. A possible explanation could be that those respondents who had a perineal injury (47.5%) had limitations in postpartum sexual intercourse due to pain.

The finding compares studies by Rådestad et al. (2008) in Sweden, Dean et al. (2008) in Scotland, England, and New Zealand, Rogers, Leeman, Migliaccio, and Albers (2008) in New Mexico, USA, and a systematic review by Leeman and Rogers (2012) who found pelvic floor trauma (perineal laceration or episiotomy) significantly increased the risk of dyspareunia in the postpartum period.

This finding however contrasts studies by De Souza et al. (2015) in Australia, Fodstad et al. (2016) in Norway, Barbara et al. (2016) in Italy, and systematic reviews by Serati et al. (2010) and that by Yenziel and Petri (2013) that found no long term impact of pelvic floor trauma (perineal laceration or episiotomy) on postpartum sexual functioning.

#### **5.4.6 Birth Weight**

Birth weight was not significantly associated with sexual dysfunction at 12 months postpartum. This is could be explained by considering that the birth weight of the

respondents in this study had a median of 3200 grams which is considered appropriate for term deliveries. Delivery of large for gestation babies increases the risk of perineal injury at birth and may limit sexual function due to the resultant perineal pain.

The finding is consistent with a study by Serati et al. (2008) in Italy and systematic reviews by Serati et al. (2010) and Johnson (2011) who all reported fetal weight was not significantly associated with sexual function after delivery.

#### **5.4.7 Contraceptive Use**

Contraceptive use was not significantly associated with sexual dysfunction at 12 months postpartum. This could be explained by fact that only 31.1% of the respondents were using a contraceptive at the 12-month visit.

These findings contrast a study by Butt, Lema, Mukaindo, Mohamoud, and Shabani, (2019) in Kenya who discussed a high prevalence of and a strong association between hormonal contraception and female sexual dysfunction. It is also contrasted by studies by Sok et al. (2016) in Utah, USA, and Iliyasu, Galadanci, Danlami, Salihu, and Aliyu (2018) in Nigeria who reported contraceptive use was significantly associated with postpartum sexual function through association with early sex resumption.

#### **5.4.8 Antenatal Sex Education**

Antenatal sex education was not significantly associated with sexual dysfunction at 12 months postpartum. This could be explained by fact that only 20% of the respondents had antenatal sex education. These education sessions were received from different antenatal centers thus there was no uniformity in content and style of presentation.

This finding contrasts studies by Afshar et al. (2012), Mahdiabadzade, Nasiri, GholamiDehaghi, Bahadoran (2015), and Heidari, Aminshokravi, Zayeri, and Azin (2018) all from Iran and a review by Foux (2008) from Britain who all discuss the influence of antenatal sex education on sex function in both the new mother and couples.

### **5.5 Study Strengths and Limitations**

#### **5.5.1 Strengths**

1. A prospective study design.
2. A long follow-up period of one year at five intervals corresponds to the vaccination schedule.
3. The use of a validated tool.

#### **5.5.2 Limitations**

1. The study is hospital-based with all women being educated thus limiting the ability to generalize to other women populations.

## CHAPTER SIX

### 6.0 CONCLUSIONS AND RECOMMENDATIONS

#### 6.1 Conclusion

1. The median duration to resumption of sexual intercourse in Primiparous women at MTRH was 72 days.
2. A majority of Primiparous women at MTRH had resumed sexual intercourse by the end of one year after delivery.
3. Of those Primiparous women at MTRH who had resumed sexual intercourse, a minority had sexual dysfunction the most common being lubrication difficulty.
4. Of the factors tested, only perineal injury was significantly associated with this dysfunction.

#### 6.2 Recommendations

1. Postpartum care should involve assessing women throughout the first year for
  - a. Resumption of sexual intercourse.
  - b. Sexual dysfunction.
2. Primiparous women resuming sexual intercourse after delivery should consider the use of vaginal lubricants as needed.
3. Perineal injury after delivery should be managed appropriately.
4. Further studies should:
  - a. Incorporate a qualitative approach to explore reasons for the delay in the resumption of sexual intercourse.
  - b. Involve longer periods (Pre-pregnancy, pregnancy, and postpartum).
  - c. Involve the partner's perspective.
5. The Kenya Postpartum care guidelines in the Mother and Child Health Booklet, MOH 216, should include a section on postpartum sexual health that assesses sexual resumption and dysfunction.



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## APPENDICES

### **Appendix I: Consent Form**

My name is Dr. John Odhiambo Ogot and I am currently pursuing a Degree Master of medicine in Reproductive Health at Moi University, College of Health Sciences. As part of the fulfillment of this course, I am writing a thesis on **Postpartum Sexual Resumption and Dysfunction in Primiparous women seen at MTRH**, assessing the time to resumption of sexual intercourse, incidence, and factors associated with sexual dysfunction after delivery. I will ask you questions about your phone contacts, socio-demographics, delivery outcome, contraceptive use, infant feeding, and sexual activity after delivery.

This study will be carried out in the hospital at the postnatal/well-baby clinic over one year at five intervals: Six, ten, fourteen weeks then at nine and twelve months postpartum coinciding with the vaccination schedule.

A trained research assistant will assist during the follow-up period. The phone number you provide will be used only to send reminders for the clinic visits. You will be compensated with two hundred Kenyan shillings to cater for transport to the facility for every visit.

Your participation in the study is voluntary and will in no way change the treatment plan that your healthcare providers deems fit for you. Information gathered will be treated with utmost confidentiality; your identity will be protected (your name will not be used and you will be identified with a number only known to me and my immediate assistant). The information obtained will be used to improve services at MTRH by guiding the development of protocols of care and may be published in medical journals and/or presented in scientific symposia (both local and international).

The Moi University Ethics and Research Committee have approved this study. For any questions or clarification, please do not hesitate to contact me on 0726 874 511 or contact the chairperson of IREC, MTRH, P.O. Box 3-30100 Eldoret, Kenya.

May I proceed with the questions? Yes/ No.

Respondent' Signature.....Date .....

## Appendix II: Data Collection Form

POSTPARTUM SEXUAL RESUMPTION AND DYSFUNCTION IN  
 PRIMIPAROUS WOMEN SEEN AT MOI TEACHING AND REFERRAL  
 HOSPITAL, ELDORET, KENYA

Date.....Serial Number.....

Hospital Number.....

### Section 1: Socio-Demographic Characteristics

Year of Birth.....

Residence (County).....

Tribe/Ethnicity.....

Religion (a) None (b) Christianity (c) Islam (d) Others (specify)

Occupation (a) Formally Employed (b) Self-employed (c) Not employed

Highest Education Level (a) University/college (b) Secondary (c) Primary (d) None

### Section 2: Obstetric Characteristics (Abstracted from the Patient Chart)

Last Normal Menstrual Period.....

Date of Delivery.....

Gestation Age in Weeks at Delivery.....

Birth Weight (grams).....

Mode of Delivery

- (a) Spontaneous Vaginal Delivery
- (b) Assisted Vaginal Delivery (Vacuum)
- (c) Emergency Caesarean Delivery
- (d) Elective Caesarean Delivery

### Nature of Perineum at Delivery

- (a) Intact
- (b) Episiotomy
- (c) Perineal Tear (Tick only one if applicable)
  - i. First-degree Perineal laceration
  - ii. Second-degree Perineal laceration
  - iii. Third-degree perineal laceration
  - iv. Fourth-degree Perineal laceration

### **Section 3: Information on Sexual Health during Antenatal Clinic**

Did you receive any information about sexual health during your antenatal clinic?

- (a) Yes
- (b) No

### **Section 4: Infant Feeding Options**

Which method of infant feeding are you currently using?

- (a) Exclusive Breastfeeding (Breast Milk only)
- (b) Mixed Feeding (Breast Milk and Other Feeds)
- (c) Feeds Only

### **Section 5: Contraceptive Use**

Have used any contraceptive since delivery (a) Yes (b) No

If YES, when did you begin (Date?)

What type was it?.....

### **Section 6: Resumption of Sexual Intercourse**

Have you resumed sexual intercourse since you delivered? (a) Yes (b) No

If YES, when did you resume (Date?) .....

**Section 7: Female Sexual Function Index Questionnaire (FSFI)**

1. Over the past 4 weeks, how often did you feel sexual **desire or interest**?

5=Almost always or always

4=Most times (more than half the time)

3=Sometimes (about half the time)

2=A few times (less than half the time)

1=Almost never or never

2. Over the past 4 weeks, how would you rate your level (degree) of sexual desire or interest?

5= Very high

4=High

3=Moderate

2=Low

1=Very low or none at all

3. Over the past 4 weeks, how often did you feel sexually **aroused (“turned on”)** during sexual activity or intercourse?

0=No sexual activity

5=Almost always or always

4=Most times (more than half the time)

3=Sometime (about half the time)

2=A few times (less than half the time)

1=Almost never or never

4. Over the past 4 weeks, how would you rate your level of sexual arousal (“turn on”) during sexual activity or intercourse?

0= No sexual activity

5=Very high

4=high

3=moderate

2=low

1=very low or none at all

5. Over the past 4 weeks, how confident were you about becoming sexually aroused during sexual activity or intercourse?

0=No sexual activity

5=Very high confidence

4=High confidence

3=Moderate confidence

2=low confidence

1=very low or no confidence

6. Over the past 4 weeks, how often have you been satisfied with your arousal (excitement) during sexual activity or intercourse?

0=No sexual activity

5=Almost always or always

4=Most times (more than half the time)

3=Sometime (about half the time)

2=A few times (less than half the time)

1=Almost never or never

7. Over the past 4 weeks, how often did you become **lubricated** (“wet”) during sexual activity or intercourse?

0=No sexual activity

5=Almost always or always

4=Most times (more than half the time)

3=Sometime (about half the time)

2=A few times (less than half the time)

1=Almost never or never

8. Over the past 4 weeks, how difficult was it to become lubricated (“wet”) during sexual activity or intercourse?

0=No sexual activity

1=Extremely difficult or impossible

2=very difficult

3=difficult

4=sight difficult

5=Not difficult

9. Over the past 4 weeks, how often did you maintain your lubrication (“wetness”) until completion of sexual activity or intercourse?

0=No sexual activity

5=Almost always or always

4=Most times (more than half the time)

3=Sometime (about half the time)

2=A few times (less than half the time)

1=Almost never or never

10. Over the past 4 weeks, how difficult was it to maintain your lubrication (“wetness”) until completion of sexual activity or intercourse?

0=No sexual activity

1=Extremely difficult or impossible

2=very difficult

3=difficult

4=sight difficult

5=Not difficult



11. Over the past 4 weeks, when you had sexual stimulation or intercourse, how often did you reach **orgasm (climax)**?

0=No sexual activity

5=Almost always or always

4=Most times (more than half the time)

3=Sometime (about half the time)

2=A few times (less than half the time)

1=Almost never or never

12. Over the past 4 weeks, when you had sexual stimulation or intercourse, how difficult was it for you to reach orgasm (climax)?

0=No sexual activity

1=Extremely difficult or impossible

2=very difficult

3=difficult

4=sight difficult

5=Not difficult

13. Over the past 4 weeks, how satisfied were you with your ability to reach orgasm (climax) during sexual activity or intercourse?

0=No sexual activity

5=Very satisfied

4=Moderately satisfied

3=About equally satisfied and dissatisfied

2=Moderately dissatisfied

1=Very dissatisfied

14. Over the past 4 weeks, how satisfied have you been with the amount of **emotional closeness** during sexual activity between you and your partner?

0=No sexual activity

5=Very satisfied

4=Moderately satisfied

3=About equally satisfied and dissatisfied

2=Moderately dissatisfied

1=Very dissatisfied

15. Over the past 4 weeks, how satisfied have you been with your **sexual relationship** with your partner?

5=Very satisfied

4=Moderately satisfied

3=About equally satisfied and dissatisfied

2=Moderately dissatisfied

1=Very dissatisfied

16. Over the past 4 weeks, how satisfied have you been with your overall sexual life?

5=Very satisfied

4=Moderately satisfied

3=About equally satisfied and dissatisfied

2=Moderately dissatisfied

1=Very dissatisfied

17. Over the past 4 weeks, how often did you experience **discomfort or pain** during vaginal penetration?

0= Did not attempt intercourse

1=Almost always or always

2=Most times (more than half the time)

3=Sometimes (about half the time)

4=A few times (less than half the time)

5= Almost never or never

18. Over the past 4 weeks, how often did you experience discomfort or pain following vaginal penetration?

0= Did not attempt intercourse

1=Almost always or always

2=Most times (more than half the time)

3=Sometimes (about half the time)

4=A few times (less than half the time)

5= Almost never or never

19. Over the past 4 weeks, how would you rate your level (degree) of discomfort or pain during or following vaginal penetration?

0= Did not attempt intercourse

1=Very high

2=High

3=Moderate

4=Low

5= Very low or none at all

**Appendix III: Score Range and Factor to calculate each Domain's Score**

Domain	Question	Factor	Minimum Score	Maximum Score	Score Range
Desire	1 and 2	0.6	1.2	6	1–5
Arousal	3, 4, 5, and 6	0.3	0	6	0–5
Lubrication	7, 8, 9, and 10	0.3	0	6	0–5
Orgasm	11, 12, and 13	0.4	0	6	0–5
Satisfaction	14, 15, and 16	0.4	2	6	0 (or 1)–5*
Pain	17, 18, and 19	0.4	0	6	0–5

Notes:

\*Range for item 14: 0–5

\*Range for items 15: 1–5

\*Range for items 16: 1–5

### Appendix IV: Independent and Dependent Variables

INDEPENDENT VARIABLES	DEPENDENT VARIABLES
<p><b>Socio-Demographic Characteristics</b></p> <ul style="list-style-type: none"> <li>• Age</li> <li>• Highest Education Level</li> <li>• Occupation</li> <li>• Religion</li> </ul>	<p>Postpartum Sexual Function</p>
<p><b>Obstetrics Characteristic</b></p> <ul style="list-style-type: none"> <li>• Mode of Delivery</li> <li>• Nature of Perineum at Delivery</li> <li>• Birth Weight</li> </ul>	
<p><b>Contraceptive Use</b></p>	
<p><b>Infant Feeding Options</b></p> <ul style="list-style-type: none"> <li>• Exclusive Breastfeeding</li> <li>• Mixed Feeding</li> <li>• Feeds Only</li> </ul>	
<p><b>Antenatal Sex Education</b></p>	



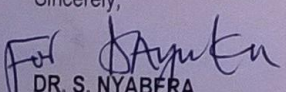
**Appendix V: Budget**

<b>Items</b>	<b>Quantity</b>	<b>Unit Price (Ksh)</b>	<b>Total (Ksh)</b>
<b><i>Stationery &amp; Equipment</i></b>			
Printing Papers	5 reams	400.00	2,000.00
Document Wallets	6	50.00	300.00
Writing Pens	1 packet	500.00	500.00
Spring File	2	165.00	330.00
Box Files	2	250.00	500.00
Flash Discs	1	2,000.00	2,000.00
Portable Hard Drive	1	5,000.00	5,000.00
Safe Box	1	2,000.00	2,000.00
Cell Phone and SIM Card	1	5,000.00	5,000.00
Note Books	4	50.00	200.00
Clip Board	1	250.00	250.00
<b>Subtotal</b>			<b>18,080.00</b>
<b><i>Research Proposal Development</i></b>			
Printing Data Collection Forms	750 documents	21.00	15,750.00
Printing & Binding Proposal Drafts			6,700.00
Cell Phone Bill (Call & Transaction cost)			12,500.00
<b><i>IREC Fees</i></b>			2,000.00
<b>Subtotal</b>			<b>36,950.00</b>
<b><i>Personnel and Respondent Compensations</i></b>			
Biostatistician	3	68,000.00	68,000.00
Research Assistant	15 months	30,000.00	450,000.00
Transport Compensation to Respondents	125	1000.00	125,000.00
<b>Subtotal</b>			<b>643,000.00</b>
<b><i>Thesis Development</i></b>			
Printing of Draft Thesis	10 copies	300.00	3,000.00
Photocopy of Thesis for Marking	6 copies	400.00	2,400.00
Printing/Binding of the Final Thesis for the Library	7 copies	1,000.00	7,000.00
<b>Subtotal</b>			<b>4,200.00</b>
<b>Grand Total</b>			<b>710,430.00</b>

**Appendix VI: Work Plan**

<b>Time (Year)/ Activities</b>	<b>April 2017- April 2019</b>	<b>July 2019</b>	<b>Aug 2020</b>	<b>Aug 2020- Sept 2020</b>	<b>Sept 2020</b>	<b>Dec 2020</b>	<b>Jan 2021- June 2021</b>
<b>Proposal Development and Approval</b>							
<b>Data Collection</b>							
<b>Data Analysis</b>							
<b>Thesis Writing</b>							
<b>Dissemination and Feedback</b>							

## Appendix VII: IREC Formal Approval

 <p><b>MU/MTRH-INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)</b>          MOI TEACHING AND REFERRAL HOSPITAL          P.O. BOX 3          ELDORET          Tel: 334711/2/3          Reference: IREC/2018/253  <b>Approval Number: 0003285</b></p>	 <p>MOI UNIVERSITY          COLLEGE OF HEALTH SCIENCES          P.O. BOX 4606          ELDORET          1<sup>st</sup> April, 2019</p>								
<p>Dr. John Odhiambo Ogot,          Moi University,          School of Medicine,          P.O. Box 4606-30100,  <u>ELDORET-KENYA.</u></p>									
<p>Dear Dr. Odhiambo,</p> <p><b><u>RE: FORMAL APPROVAL</u></b></p> <p>The MU/MTRH- Institutional Research and Ethics Committee has reviewed your research proposal titled: -</p> <p><b><i>"Postpartum Sexual Resumption and Dysfunction in Primiparous seen at Moi Teaching and Referral Hospital, Eldoret, Kenya".</i></b></p> <p>Your proposal has been granted a Formal Approval Number: <b>FAN: IREC 3285</b> on 1<sup>st</sup> April, 2019. You are therefore permitted to begin your investigations.</p> <p>Note that this approval is for 1 year; hence will expire on 31<sup>st</sup> March, 2020. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date. You will be required to submit progress report(s) on application for continuation, at the end of the study and any other times as may be recommended by the Committee.</p> <p>Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. You will also be required to seek further clearance from any other regulatory body/authority that may be appropriate and applicable to the conduct of this study.</p>									
<p>Sincerely,</p> <p>  <b>DR. S. NYABERA</b>          DEPUTY-CHAIRMAN  <b>INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE</b></p>	<div style="border: 2px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="text-align: center; margin: 0;"><b>INSTITUTIONAL RESEARCH &amp; ETHICS COMMITTEE</b></p> <p style="text-align: center; margin: 0; color: red; font-size: 1.2em;">01 APR 2019</p> <p style="text-align: center; margin: 0;"><b>APPROVED</b></p> <p style="text-align: center; margin: 0; font-size: 0.8em;">P. O. Box 4606-30100 ELDORET</p> </div>								
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">cc</td> <td style="width: 25%;">CEO - MTRH</td> <td style="width: 25%;">Dean - SOP</td> <td style="width: 25%;">Dean - SOM</td> </tr> <tr> <td></td> <td>Principal - CHS</td> <td>Dean - SON</td> <td>Dean - SOD</td> </tr> </table>		cc	CEO - MTRH	Dean - SOP	Dean - SOM		Principal - CHS	Dean - SON	Dean - SOD
cc	CEO - MTRH	Dean - SOP	Dean - SOM						
	Principal - CHS	Dean - SON	Dean - SOD						



## Appendix VIII: IREC Continuing Approval



MOI TEACHING AND REFERRAL HOSPITAL  
P.O. BOX 3  
ELDORET  
Tel: 334711/2/3

### INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI UNIVERSITY  
COLLEGE OF HEALTH SCIENCES  
P.O. BOX 4606  
ELDORET  
Tel: 334711/2/3  
1<sup>st</sup> April, 2020

Reference: IREC/2018/253  
**Approval Number: 000305**

Dr. John Odhiambo Ogot,  
Moi University,  
School of Medicine,  
P.O. Box 4606-30100,  
**ELDORET-KENYA.**

Dear Dr. Odhiambo,

#### RE: CONTINUING APPROVAL

The Institutional Research and Ethics Committee has reviewed your request for continuing approval to your study titled:-

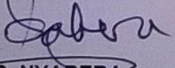
***"Postpartum Sexual Resumption and Dysfunction in Primiparous seen at Moi Teaching and Referral Hospital Eldoret, Kenya".***

Your proposal has been granted a Continuing Approval with effect from 1<sup>st</sup> April, 2020. You are therefore permitted to continue with your study.

Note that this approval is for 1 year; it will thus expire on 31<sup>st</sup> March, 2021. If it is necessary to continue with this research beyond the expiry date, a request for continuation should be made in writing to IREC Secretariat two months prior to the expiry date.

You are required to submit progress report(s) regularly as dictated by your proposal. Furthermore, you must notify the Committee of any proposal change (s) or amendment (s), serious or unexpected outcomes related to the conduct of the study, or study termination for any reason. The Committee expects to receive a final report at the end of the study.

Sincerely,


  
**DR. S. NYABERA**  
DEPUTY-CHAIRMAN  
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE




cc:	CEO	-	MTRH	Dean	-	SOD
	Principal	-	CHS	Dean	-	SPH
	Dean	-	SOM	Dean	-	SON



## Appendix IX: Permission to Conduct Research at MTRH



An ISO 9001:2015 Certified Hospital



# MOI TEACHING AND REFERRAL HOSPITAL

Telephone : (+254)053-2033471/2/3/4  
 Mobile: 722-201277/0722-209795/0734-600461/0734-683361  
 Fax: 053-2061749  
 Email: [ceo@mtrh.go.ke](mailto:ceo@mtrh.go.ke)/[directorsofficemtrh@gmail.com](mailto:directorsofficemtrh@gmail.com)

Nandi Road  
P.O. Box 3 – 30100  
ELDORET, KENYA

Ref: ELD/MTRH/R&P/10/2/V.2/2010 3<sup>rd</sup> April, 2019

Dr. John Odhiambo Ogot,  
 Moi University,  
 School of Medicine,  
 P.O. Box 4606-30100,  
ELDORET-KENYA.

### APPROVAL TO CONDUCT RESEARCH AT MTRH

Upon obtaining approval from the Institutional Research and Ethics Committee (IREC) to conduct your research proposal titled:-

***“Postpartum Sexual Dysfunction in Primiparous at Moi Teaching and Referral Hospital, Eldoret, Kenya ”.***

You are hereby permitted to commence your investigation at Moi Teaching and Referral Hospital.

MOI TEACHING AND REFERRAL HOSPITAL  
CEO  
APPROVED  
03 APR 2019

SIGN.....  
P.O. Box 3 - 30100, ELDORET

*Wilson* 03/04/2019  
**DR. WILSON K. ARUASA, MBS**  
**CHIEF EXECUTIVE OFFICER**  
**MOI TEACHING AND REFERRAL HOSPITAL**

cc - Senior Director, (CS)  
 - Director of Nursing Services (DNS)  
 - HOD, HRISM

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All correspondence should be addressed to the Chief Executive Officer  
 Visit our Website: [www.mtrh.go.ke](http://www.mtrh.go.ke)  
 TO BE THE LEADING MULTI-SPECIALTY HOSPITAL FOR HEALTHCARE, TRAINING AND RESEARCH IN AFRICA