

FACTORS ASSOCIATED WITH UPTAKE OF LONG ACTING REVERSIBLE  
CONTRACEPTIVES METHODS AMONG POSTPARTUM WOMEN AT JUBA  
TEACHING HOSPITAL: A CROSS SECTIONAL STUDY

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DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY IN PARTIAL FULFILMENT  
OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF MEDICINE IN  
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**November 2016**

## **DECLARATION**

This is to declare that this research work and dissertation is my original work and has not been submitted to any other university for the award of a degree.

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## **ACKNOWLEDGEMENTS**

Special thanks to my supervisors, Prof. James Oyieke and Dr. F.X Odawa for the close guidance, availability and supervision from the stage of concept development through to the conduct, analysis and reporting of this study.

I am also grateful to the University of Nairobi, Kenyatta National Hospital and Juba Teaching Hospital for providing an enabling learning environment for carrying out this work. I am especially thankful to all consultants and lecturers in the department of Obstetrics and Gynaecology both at University of Nairobi and Kenyatta National Hospital for sharing their knowledge and experience with us during the study period. Last but not least I appreciate most sincerely all my fellow registrars for their support, cooperation and teamwork. May God bless you All.

## **DEDICATION**

To the almighty God whose grace has been sufficient and without whom I would not have come this far.

This book is dedicated to my late parents -Samuel and Kiden- and to my family for their sacrifice and support to give me the best education.

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## **OPERATIONAL DEFINITIONS**

**Contraceptive prevalence rate:** Is the percentage of women who are currently using, or whose sexual partner is currently using, at least one method of contraception, regardless of the method used. It is usually reported for married or in-union women aged 15 to 49

**Postpartum family planning (PPFP):** Is defined as the prevention of unintended pregnancy and closely spaced pregnancies through the first 12 months following childbirth

**Long acting reversible contraceptives (LARC):** Are methods of **birth control** that provide effective **contraception** for an extended period without requiring user action. For the purpose of this study LARC include intrauterine devices (IUDs) and sub-dermal **contraceptive** implants

## **ACRONYMS AND ABBREVIATIONS**

ANC	Antenatal clinic
ACOG	American college of Obstetrician and Gynaecologists
DHS	Demographic and Health Survey
FP	Family planning
HIV	Human Immune deficiency
IUD	Intrauterine contraceptive device
INGOs	international non-governmental organizations
JTH	Juba Teaching Hospital
KNH	Kenyatta national Hospital
KNBS	Kenya National Bureau of Statistics
LARC	Long acting reversible contraceptive
LTCM	Long term contraceptive methods
LNG	Levonorgestrel
MCHC	Mother and child health clinic
MoH	Ministry of health
MMR	Maternal mortality ratio
MDGs/SDGs	Millennium development goals/ sustainable development goals
PPFP	Post-partum family planning
PNC	Postnatal clinic
PMTCT	Prevention of mother to child transmission
RCOG	Royal college of Obstetrician and Gynaecologists
UNFPA	United Nations population fund
WHO	World Health Organization

## ABSTRACT

**Background:** Family planning is important for prevention of short inter-pregnancy intervals and reduction of maternal and child morbidity and mortality. While most health facilities in South Sudan provide long acting reversible contraceptive methods (LARC) Ministry of health and UNFPA reported/2014(1), the uptake is still low, especially among the postpartum women. The postpartum period presents an opportunity to counsel and provide LARC to the mothers. This study was therefore conducted to assess factors that influence LARC uptake among post-partum women at twelve weeks postpartum at Juba teaching Hospital.

**Objective of the study:**

The objective of the study is to determine factors that influence uptake of LARC among the postpartum women attending maternal and child health clinic at the Juba teaching hospital.

**Method:** A cross sectional study was conducted at Juba teaching Hospital, South Sudan, from April 2016 to May 2016. Postpartum women attending care at 12 weeks after delivery, and willing to participate were recruited into this study. Data were collected at 12 weeks postpartum using a structured questionnaire to determine postpartum contraception utilization of LARC and factors associated with its use.

**Results:** The mean age of the postpartum mothers was 25.4 (SD  $\pm$  5.1) years. Among the participants 129 (43.7%) mothers reported ever receiving prior FP counselling and 69 (23.4%) had ever used any FP method. During the postpartum period a total of 18 out of the 295 participants reported use of LARC yielding an uptake of 6.1% (95% CI 3.7 to 9.5%), and all 18 mothers used implants. LARC uptake was significantly associated with mode of delivery (OR 3.71; 95% CI 1.23-11.24), early resumption of sexual activity (OR = 4.84, 95% CI 1.68-14.0), discussions with provider (OR = 5.15, 95% CI 1.46-18.20).

**Conclusions:** The prevalence of LARC uptake was low. If IUD and Implant use are to be expanded in South Sudan, potential users will need education about the methods and providers will need training on counselling and provision. Factors found to be associated with LARC use should be utilized by the South Sudanese government in its family planning awareness campaign. Changes in attitudes toward LARC among South Sudanese may increase their practice of LARC.

## CHAPTER ONE

### BACKGROUND AND LITERATURE

#### Background

While family planning (FP) is important throughout an individual's and couple's reproductive life, postpartum family planning (PPFP) focuses on the prevention of unintended and closely spaced pregnancies through the first 12 months following childbirth(2). The first year after a woman has given birth is crucial for use of contraceptives to prevent unwanted pregnancy(3). Many women, however, do not realize that they are at risk for pregnancy during this period. Consequently, contraceptive use by women during this period is low, resulting in unintended pregnancies and unwanted childbearing (4). About 80 million unintended pregnancies worldwide are accounted for by low utilization of contraceptives during the postpartum period(5). Mothers are exposed to high morbidity and mortality during pregnancy and child birth if the pregnancies are too early, too close, too many or too late(6).

Integration of family planning services for female clients with other reproductive health services lowers the cost to clients and reduces missed opportunities for family planning services(7).The mother's health, wellbeing as well as outcome of each pregnancy depend on the ability of the woman to limit and space her pregnancies(8). Fifty percent of maternal mortalities in the developing world could be addressed through family planning services(9). According to the south Sudan maternal and child health data 2014, the total fertility rate is 5 children per Woman and unmet need for FP is twenty six percent(11).

South Sudan has one of the lowest contraceptive prevalence rates at 4.7%; Modern contraceptive use stands at 1.7% among all women and 3% for traditional methods(12). South Sudan more so, has a high maternal mortality ratio(MMR) of 730 maternal deaths per 100,000 live births, and an infant mortality rate (IMR) of 75 per 1,000 live births per year(13), this high maternal morbidity and mortality could partly be attributed to unintended pregnancies and short birth intervals. If properly utilized PFP is one of the best interventions to reduce maternal and neonatal morbidity and mortality (14),because two thirds of maternal and neonatal mortalities occur during the postnatal period(15).

Long acting reversible contraceptive (LARC) methods in this study refer to implants and intrauterine devices (Copper-T and Levonorgestrel). The American College of Obstetricians and Gynaecologists (ACOG) has recommended that LARC methods should be offered as first line contraceptives methods and should be encouraged as options for most women(16). This is because according to World Health Organization's evidence based Medical Eligibility Criteria for Contraceptive use, LARC methods are top-tier effective reversible methods that have few contraindications and can be used by almost all women.(17). LARC have the following advantages over other methods(18): Require single act of motivation for long term use, their effectiveness is not user dependent nor do they require adherence, have the highest continuation rates of all contraceptive methods, are independent from coitus, safe during breast feeding to both the mother and the child, do not require frequent visits for resupply, require no additional funding for consistent use once they have been placed, are highly cost effective and are reversible with a rapid return to fertility after removal(19)

There are 2 IUDs available in public facilities: the copper T 380A IUD and the levonorgestrel intrauterine contraception system (LNG-IUS). The LNG-IUS is a T-shaped

frame made of polyethylene that releases LNG at a rate of 20 µg per day, the system provides 5 years of reliable contraception(20), with a 0.2% failure rate in the first year(21). Progesterin thickens cervical mucus, inhibits sperm capacitation and motility, causes endometrial atrophy, and can suppress ovulation in some women.

Advantages of the LNG-IUS include high effectiveness and ease of use. Additionally, this method is not contraindicated for use in most patients with medical co morbidities and in women who cannot use oestrogen-containing contraceptives(22) It has non contraceptive health benefits(23) and few contraindications compared to other methods of family planning(24)

The copper T380A IUC is a polyethylene T-shaped frame with copper wire wrapped around the 2 arms and stem of the T. This method is highly effective for at least 10 years, with a failure rate of 0.6% to 0.8% in the first year(25).The copper appears to decrease the ability of sperm to fertilize the ovum(26). Contraindications to the copper IUC are similar to the LNG-IUS with the addition of allergies to the components of the IUC, including copper. Adverse events are also similar to the LNG-IUS.

Contraceptive implants, also known as sub-dermal implants are small plastic rods or capsules each about the size of a matchstick inserted under the skin of a woman's upper arm that releases progesterin hormone slowly to achieve contraception.

There are mainly two types of implants in the public health facilities; Jadelle, made up of 2 rods each containing 75mg of LNG effective for 5 years, and Implanon made up of a single rod containing 68mg of Etonogestrel effective for 3 years(27).Implants are effective reversible contraceptives with a pregnancy rate of 0.05% and the highest continuation rate of 84%(28). They work primarily by; thickening cervical mucus thus blocking sperm

movement, disrupts the menstrual cycle by interfering with Hypothalamo-Pituitary-Ovarian (HPO) axis thus suppressing ovulation, and by altering endometrial lining thereby impairing implantation(28).While complications following their use are uncommon(27).In addition to contraceptive benefits, implants do not interfere with breastfeeding, they reduce menstrual flow thus protecting against iron deficiency anaemia, and helps prevent ectopic pregnancy as well as protecting from symptomatic Pelvic Inflammatory Disease (PID)(29).Despite the theoretical concern on breast milk production and infant's growth and development, postpartum use of IUDs and implants have repeatedly been shown to be safe and effective in both breast feeding and non-breastfeeding mothers(30).

### **Literature review**

One important step to address the high unmet need for family planning in South Sudan is to explore factors that influence or deter women's decisions to use or not use contraception. Early research in this area focused mainly on individual-level determinants of contraceptive uptake, including individual characteristics, such as socioeconomic and demographic factors(31), and psychosocial factors encompassed by theories of behaviour change (32). More recently, researchers have emphasized the importance of considering multilevel determinants of health behaviour, including not only factors at the individual and interpersonal level, but also contextual factors, such as community norms and environmental/structural barriers and facilitators to family planning access and utilization (31), especially in resource-limited settings(33). Research in Family planning relayed in Family planning policies in several countries have emphasized the need to promote the use

of LARC methods, as the most cost effective strategy to reduce unintended pregnancies and short inter-pregnancy interval (34). Because they do not require daily adherence, these methods are shown to be substantially more effective than user-dependent hormonal methods that suffer higher typical use failure rates (35).

Results from the French National Abortion Patient Study 2007, showed that 61.5% of pregnancies leading to abortions were due to user-dependent method failures, 33.5% related to barrier and natural methods use, 25% to pill use and 3% other hormonal user-dependent methods, while less than 2% occurred to women using LARC)(36).

A cohort study by Tang & Dominik et al in 2013, about Characteristics associated with interest in LARCs use among the postpartum population in United States, they found high interest in LARC among postpartum women with a recent unintended pregnancy and women who did not desire pregnancy for at least 2 years. This study recommended that past and future pregnancy intentions should be incorporated into future models and frameworks that evaluate postpartum contraceptive choice and educational intervention studies are also needed to assess if LARC interest can be increased among postpartum women who are likely to use LARC(37).

A study in France found that the odds of using LARC was > 4 times higher in women in their 20s as compared to teenagers and the increase was even greater in parous women. A prior experience of an unintended pregnancy seemed also to be a strong motivation to use LARCs regardless of women's parity. LARC use depended on unemployment, women receiving government health care coverage and women reporting difficult financial situations. Specialized Gynaecological care was associated with higher odds of LARC use.



This study of LARC use was associated with only one health indicator in the form of smoking status, while history of STI and obesity were not(38).

Withers et al conducted a longitudinal study in Bali and Singapore 2012. He found that up to 30% of married women who expressed interest in ending child bearing had an unwanted pregnancy in the first 4 years of follow up. At highest risk of conceiving were women not on long term methods, and those who lacked of relevant information. This study showed a strong association between level of education and the choice of long term contraceptive methods and in turn less incidence of unwanted pregnancies(39).

Analysis of 27 Demographic and Health Surveys(40) found that the unmet need for contraception during the first year in sub Saharan Africa was 74 percent with only 18 percent of postpartum mothers using long term methods. The survey showed that in Nigeria and India, the unmet need for PFP was alarmingly high at 62 and 73 percent respectively, and only one fifth of postpartum mothers used family planning during the first year after birth (41)

Gebreselassie et al investigated Spousal agreement on preferred waiting time for next birth in sub-Saharan Africa. This study investigated how various social, demographic and economic factors affect spousal agreement on preferred waiting time to next birth and use of long term contraceptive. Data found that in sub-Saharan Africa, waiting time was not supported by most women partners. Additionally, the study found that demographic factors were the primary determinants of spousal agreement on waiting time to next birth, not socioeconomic factors. The strongest predictors of spousal agreement on waiting time to next birth were number of living children, difference between the number of ideal and

living children and wife's age. Couples with fewer children, a younger wife and those with a difference of five or more children between ideal and living number of children were more likely to agree on waiting time to next birth. Effects of socioeconomic factors, such as education and wealth status, on spousal agreement on waiting time to next birth were generally weak and inconsistent. The findings highlight some of the challenges in developing programmes to promote spousal communication and birth spacing and underscore the need for gender-sensitive programmes(42). Thus the conclusion was that LARC use was less preferred option

Sileo et al carried out study in Uganda that suggested that social learning is relevant in areas with high market activity as compared to regions with only modest market activity. However, social influence is the dominant means by which social networks affect women's contraceptive use(43).

Stephenson et al in Zambia stated that, family planning counselling services should be expanded to address physical, social and emotional needs of continuing clients.

Moreover, interventions to improve client-provider interactions should also address contextual and health system factors that prevent clients from using FP consistently and effectively(44).

Ethiopian study by Mengesh et al, 2015(45) identified 90 percent unmet need for PFP during 0-3 months after delivery, 80 percent between 7-8 months and by the end of the first year after delivery the level of unmet need was at 68 percent. The high unmet need for PFP prevails despite Ethiopia having recorded remarkable rise in contraceptive use over the years since, which currently stands at 42 percent (Ethiopian DHS 2014) yet, the

Demographic and Health Surveys have over the years underestimated the contribution of the new postpartum mothers to the unmet need in the extended postpartum period.

## **JUSTIFICATION**

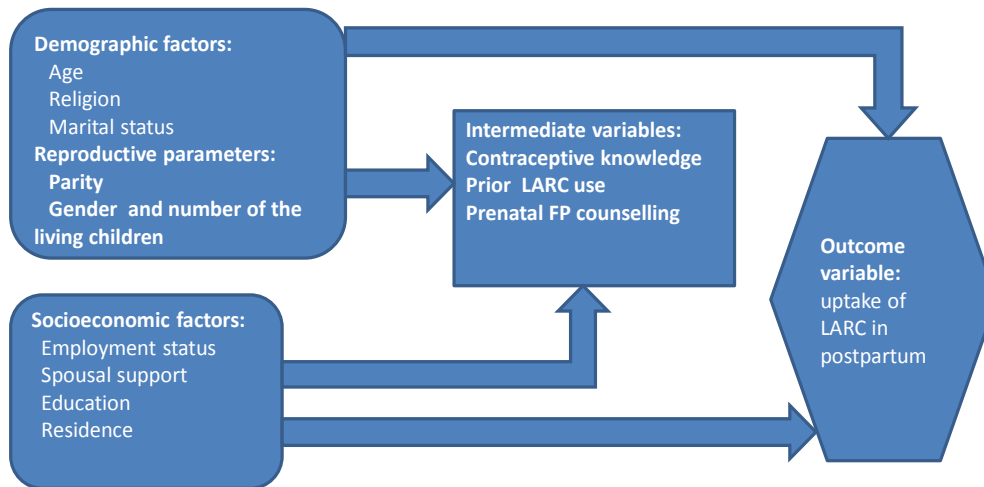
Worldwide, the unmet need for FP among postpartum women is estimated at 40%. Globally, FP is recognized as a key life-saving intervention for mothers and their children (WHO 2012b). PFP has an important role to play in strategies to reduce the unmet need for FP. Postpartum women are among those with the greatest unmet need for FP. Yet they often do not receive the services they need, to support longer birth intervals or reduce unintended pregnancy and its consequences. PFP can avert more than 30% of maternal deaths and 10% of child mortality if couples space their pregnancies more than 2 years apart (46), and LARC is the best option to achieve this. Despite poor postpartum return visit in South Sudan (at 20% by UNFPA RH indicators 2015), postpartum women have been largely neglected in the integration of reproductive health services in particular integration of FP service. This is in spite of the knowledge that postpartum period is an opportune time to introduce FP since the women are highly motivated to use contraception during this time. There has been no study in the country to find out why the prevalence of FP is low, and the factors that determine use of long term contraceptives especially in the postpartum mothers. Therefore, this study aims at determining those factors that deter use of LARCs by this group of women. The findings of this will contribute to the existing body of knowledge on postpartum contraception in an attempt to reduce unmet need; improve contraceptive choices; promote optimum health of postpartum mothers and the children and encourage birth spacing of more than two years. The findings will be shared with

health care providers through forum such as seminars and conferences to enhance attention to the postpartum mothers to improve uptake of LARCs and PPF in general. The study outcome will specifically enlighten PPF program implementers on the appropriate strategies and intervention measures to adopt in order to reach out to this category of postpartum mothers

### **CONCEPTUAL FRAMEWORK**

Despite the combined efforts of government, and international NGOs to tackle high rate of unplanned pregnancies, unsafe abortions, high maternal mortality and high under five and infant mortality rate, in order to achieve MDGs (4, 5, and 6) target, the FP prevalence remains very low at 4.7%. Among the postpartum contraceptive methods, LARCs uptake remains the lowest. This state of affairs translates to high maternal mortality rate of 2,045/100,000 lives birth, a total fertility rate at 6.7 children per woman. There are several client factors that could influence their uptake of LARC; lack education, big family size as the cultural norms, fear of side effects, poverty and lack of partner support. Provision of family planning service during the first year postpartum is a critical component of maternal and child health (MCH) and reproductive health services. During postpartum period women are more receptive to contraceptive methods and increase their contacts with health care providers, thus providing an opportunity to counsel them on LARCs which could increase uptake. Such actions will in the long run help address the problems of: unmet of FP, short inter-pregnancies interval, unsafe abortion, and reduced maternal death and infant mortality rates, and therefore bridge the gap towards achievement of MDG 4, 5

Figure 1: conceptual framework



## **STUDY QUESTION:**

What are the factors associated with uptake of long acting reversible contraceptives methods amongst postpartum women at Juba Teaching Hospital at twelve week?

## **OBJECTIVES**

### **Broad Objective:**

To determine factors associated with uptake of long term reversible family planning methods amongst the postpartum women at Juba Teaching Hospital at twelve week

### **Specific objectives:**

1. To determine the prevalence of postpartum LARCs use among postpartum women at Juba Teaching Hospital
2. To determine the effect of socio-demographic factors on uptake of LARCs among the postpartum women at Juba Teaching Hospital
3. To assess factors that influences the uptake of LARCs among the postpartum mothers at Juba teaching hospital

## **CHAPTER TWO**

### **RESEARCH METHODS**

#### **STUDY DESIGN**

This was a hospital based cross sectional study in which women using LARC methods were analysed to determine factors associated with use of LARC after determining the prevalence of use of LARC methods.

#### **STUDY SITE AND SETTING**

The Juba teaching hospital is a national referral hospital located in Juba, the capital city of South Sudan, where the patients benefit from free health care services in the country. The hospital has the highest number of deliveries in the country, nearly 6000 deliveries annually. It takes care of majority of high-risk deliveries, obstetric emergencies and uncomplicated deliveries from all over the country. In addition, the hospital offers FP and immunization services to women who have delivered in the neighbouring facilities or at home.

#### **STUDY POPULATION**

Population of Study participants were women at twelve weeks postpartum. Entry point was the MCHC at Juba teaching hospital, after they had been attended to by their primary care providers

#### **Inclusion criteria**

1. Women at week twelve weeks postpartum

2. Women who were willing and able to sign consent

### **Exclusion criteria**

1. Women who had hysterectomy
2. Women who underwent bilateral tubal ligation
3. Those who declined to participate
4. Women before and after 12<sup>th</sup> week were excluded

### **Sample size determination**

The following formula(fisher) was used based on precision(47)

$$(N = Z^2 \times P (1-P)/d^2)$$

Where; N = the minimum sample size to enable estimation of prevalence

Z = the standard normal distribution (1.96)

P = assumed prevalence of LARC usage (4.6% in this scenario)

d = the desired level of precision in this case 2.5%

Therefore;

$$N = (1.96^2 \times [0.046(100-0.046)]/ (0.025^2) = 269 \text{ women}$$

The actual sample size recruited was however inflated by 10% to cater for any attrition, thereby bringing the total sample size to 295 women. This constituted all women randomly selected at maternal and child health clinic in Juba teaching hospital



## **Sampling procedure**

The sampling frame was all women attending the MCH clinic. Women who met the eligibility criteria were invited to participate in the study after being informed about the aims of the study. Those who consented to participate in the study were assured of privacy and confidentiality. Women were recruited consecutively until the desired number was achieved.

## **DATA COLLECTION AND MANAGEMENT**

### **Data collection**

A structured questionnaire was used to collect data from postpartum women during structured interviews (appendix 3). The questionnaire was administered by study assistants. Study assistants were trained on study procedures, objectives and appropriate interviewing techniques prior to the study.

The research assistants were fluent in both English and local languages, this was necessary to reduce the potential impact of language barrier on both study recruitment rates and data quality. The data were obtained in the language that respondents were comfortable with and the assistant was able to translate and simplify any single information to participants.

### **Study personnel**

Research assistant's recruitment was based on the following criteria; medical personnel, working in Juba Teaching hospital, were working in or previously worked in family planning clinic and fluent in English and local Languages. This was checked during the pilot testing.

Before the study started the research assistants were trained on the ethical guidelines and procedure of the study. After completion research assistants understood the following about the study: the objective of the study, ethical guidelines of the study, the process and importance of informed consent, counselling on FP and filling up of the questionnaire in addition to pilot testing. The principal investigator was in charge of day-to-day implementation of the study.

### **Quality control**

Data collection tools were pretested and refined prior to data collection. Data were checked for completeness and correctness before being entered into a Microsoft excel with in-built consistency and validation checks. The data were then cleaned and stored in a password-protected computer and backed up on a dedicated USB drive. Any data entry errors noted in the database during data cleaning was resolved by referring back to the questionnaires.

The hard copy records carried for analysis were stored under lock and key. No patient identifiers were entered into the study databases. The database was only accessible to the principal investigator, statistician and the supervisors.

### **Data analysis**

Data were exported to SPSS IBM version 20 for analysis. Descriptive statistics of the social demographic factors were calculated, including counts and relative frequencies for categorical variables. Continuous data were analysed using mean and standard deviation and these descriptive statistics were reported for normally distributed data.

The main outcome was the percentage of women taking up LARCs. Proportions and 95% confidence intervals were used to describe categorical variables. We used Odds ratios for

inferential statistics to compare the factors associated with use of LARCs uptake. Odds ratios were also used to determine their association with uptake of LARCs. A significance level of 0.05 was used to determine the association. Multivariable regression was conducted with LARC uptake as the dependent variable and the factors that were significantly associated with LARC in the unadjusted analysis included as independent variables.

### **ETHICAL CONSIDERATION**

The UoN/KNH ERC and Ministry of Health/South Sudan ERC approval were obtained.

The study was carried out in accordance with existing ethical guidelines in South Sudan, which included seeking permission from Juba teaching hospital and participant consent.

While obtaining informed consent study objectives, aims and potential benefits and impact of participation were explained to the eligible mothers. All participants' queries were responded to and contacts of investigators provided. Mothers who declined to participate in the study were provided care entitled to them.

### **STUDY LIMITATION**

This was a hospital based study, likely to capture the population with good health seeking behaviour, and might not represent the population in the community that does not access healthcare services. In addition, and in line with the cross sectional design for some associations observed in this study it is not possible to determine the temporal sequence between independent variables and LARC uptake.

## CHAPTER THREE

### RESULTS

A total of 295 postpartum women at Juba Teaching Hospital were recruited in the study.

The demographic characteristics of the participants are summarized in table 1.

**Table 1: Demographic characteristics of women attending postpartum care at JTH**

	Frequency (n)	Percent (%)
<b>Age</b>		
<20 years	35	11.9
20-24 years	100	33.9
25-29 years	95	32.2
30-34 years	51	17.3
35-40 years	14	4.7
<b>Marital status</b>		
Married	262	88.8
Single	22	7.5
Widowed	8	2.7
Divorced/separated	3	1
<b>Level of education</b>		
None	82	27.8
Primary	99	33.6
Secondary	85	28.8
College/university	29	9.8
<b>Religion</b>		
Christian	258	87.5
Muslim	32	10.8
Others	5	1.7

The mean age of the postpartum mothers was 25.4 (SD  $\pm$  5.1). Most of the mothers were in the age groups 20-24 years 100 (33.9%) and 25-29 years 95 (32.2%). There were 262 (88.8%) married women, and 258 (87.5%) Christians. Twenty-seven percent (82/ 295) did

not have formal education, 99 (33.6%) had primary and 85 (28.8%) had secondary education

***Reproductive characteristics of women attending postpartum care at JTH***

**Table 2: Reproductive characteristics of women attending postpartum care at JTH**

	<b>Frequency (n)</b>	<b>Percent (%)</b>
<b>Age at first delivery</b>		
< 18 years	83	28.1
18-25 years	188	63.7
> 25 years	24	8.1
<b>Parity</b>		
Parity 1-2	172	58.3
Parity 3+	123	41.7
<b>Number of living children</b>		
1 child	100	35.8
2-3 children	99	35.5
4 or more children	80	28.7
<b>Planning to have another child</b>		
Yes	252	86
No	41	14

The mean age at first delivery reported by postnatal mothers in Juba was 19.4 years (SD ± 3.4). There were 83 (28.1%) mothers who first became pregnant before attaining 18 years, and most 188 (63.7%) had the first pregnancy between 18-25 years (Table 2). After delivery of the index baby 100 (35.8%) postpartum mother reported that they had one living child, 99 (35.5%) had between 2 and 3 children and the remaining had 4 or more

living children. Most 172 (58.3%) mothers indicated that they were para 1-2 and 252 (86%) were planning to have another baby in future.

### Contraceptive knowledge and use

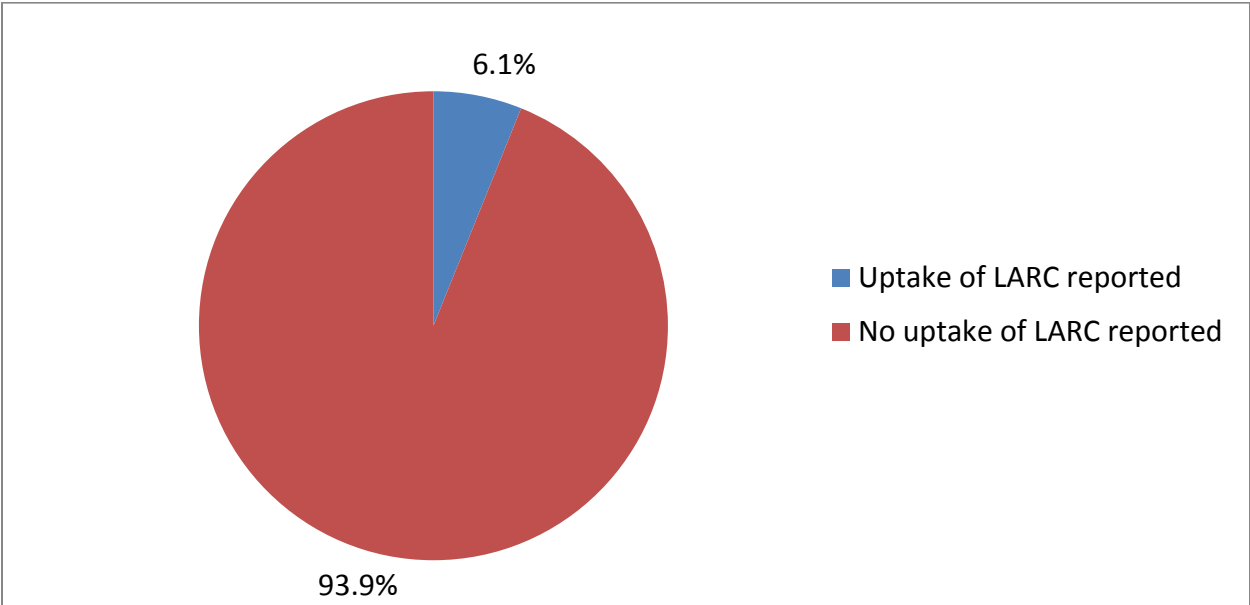
**Table 3: Postpartum mothers' knowledge and prior use of contraceptives in Juba**

	Frequency (n)	Percent (%)
<b>Postpartum mothers who knew of any contraceptive method</b>	155	52.5
<b>Methods known to postpartum mothers:</b>		
Sterilization	30	20.4
Pills	55	37.4
Implants	21	13.3
IUD	8	5.4
Injectable	25	17
Condoms	8	5.4
<b>Postpartum mothers reporting ever receiving prior FP counselling</b>	129	43.7
<b>Postpartum mothers who had ever used any FP method:</b>	69	23.4
<b>FP methods used:</b>		
Pills	15	21.7
IUD/ implants	20	29
Injectable	31	44.9
Condoms	3	4.3

There were 155 (52.5%) mothers who said that they knew of any family planning method (Table 3). The most commonly known methods were: pills 55 (37.4%) and sterilization 30 (20.4%). Among the participants 129 (43.7%) mothers reported ever receiving prior FP counselling and 69 (23.4%) had ever used of any FP method. The most commonly used methods were: injectable 31 (44.9%), and IUD/ implants 20 (29%).

**Postpartum uptake of LARC**

During the postpartum period a total of 18 out of the 295 participants reported use of LARC yielding an uptake of 6.1% (95% CI 3.7% to 9.5%), Figure 1. All the eighteen women who used LARC in the postpartum period reported that they had inserted implants. There was no report of IUD insertion.



**Figure 1: LARC uptake among postpartum mothers**

**Demographic factors and LARC uptake**

**Table 4: Demographic characteristics and postpartum uptake of LARC**

	LARC uptake		OR (95% CI)	P
	Yes	No		
<b>Age</b>				
<20 years	0(0.0)	35(100.0)	NA	
20-24 years	4(4.0)	96(96.0)	1.00	
25-29 years	6(6.3)	89(93.7)	1.62(0.44-5.92)	0.467
30-34 years	6(11.8)	45(88.2)	3.20(0.86-11.90)	0.083
35-40 years	2(14.3)	12(85.7)	4.00(0.66-24.21)	0.131
<b>Religion</b>				
Christian	12(4.7)	246(95.3)	1.00	
Muslim*	6(18.8)	26(81.3)	4.73(1.64-13.66)	0.004
Others	0(0.0)	5(100.0)	NA	
<b>Marital status</b>				
Married	16(6.1)	246(93.9)	1.00	
Single	1(4.5)	21(95.5)	0.73(0.09-5.80)	0.768
Widowed	0(0.0)	8(100.0)	NA	
Divorced/separated	1(33.3)	2(66.7)	7.69(0.66-89.37)	0.103
<b>Education level</b>				
None	2(2.4)	80(97.6)	1.00	
Primary	2(2.0)	97(98.0)	0.82(0.11-5.99)	0.849
Secondary	7(8.2)	78(91.8)	3.59(0.72-17.82)	0.118
College/university*	7(24.1)	22(75.9)	12.73(2.47-65.66)	0.002

There was a significant association between LARC uptake and education. Mothers with tertiary education were 12 times more likely to use LARC (OR = 12.73, 95% CI 2.47-65.66) compared to those with no education (p = 0.002) LARC uptake did not differ significantly among mothers with secondary (8.2%), primary (2%) or no formal education (2.4%).

Religion was also associated with uptake with Muslim women having higher uptake (18%) compared to Christian (4.7%) women (OR = 4.73, 1.64-13.66).

Age and marital status were not significantly associated with LARC uptake (Table 4)



## Socio-economic factors and LARC uptake

**Table 5: Socio-economic status and education level of participants spouses**

	n	%
<b>Spouse's education</b>		
None	42	14.6
Primary	17	5.9
Secondary	117	40.6
College/university	89	30.9
Above	23	8
<b>Spouse's occupation</b>		
Unemployed	40	14.1
Self-employed/business	51	18
Salaried employment	188	66.4
Casual labour	4	1.4

The spouses of most participants had either secondary (117/295; 40.6%) or tertiary level (89/295; 30.9%) education (Table 5). Two-thirds (188/ 296; 66.4%) of the participant's spouses were formally employed and earned salaries.

**Table 6: Socioeconomic factors and postpartum uptake of LARC**

	LARC uptake		OR (95% CI)	P
	Yes	No		
<b>Occupation</b>				
Unemployed/housewife	8(3.9)	199(96.1)	1.00	
Self-employed/business	3(9.7)	28(90.3)	2.67(0.67-10.64)	0.165
Salaried employment	4(11.4)	31(88.6)	3.21(0.91-11.30)	0.069
Casual	0(0.0)	13(100.0)	1.00	
Still in school/college/university*	3(33.3)	6(66.7)	12.44(2.62-58.93)	0.001

There was a significant association between LARC uptake and occupation of participants as shown in Table 6. Women who were attending school were more likely to take up (3.9%)

LARC compared to unemployed housewives (3.9%) OR = 12.44 (2.62 – 58.93). The rates of LARC uptake in self-employed/ business (9.7%) and salaried (11.4%) were not significantly different from unemployed housewives.

### Reproductive health factors and LARC uptake

**Table 7: Reproductive health factors and postpartum uptake of LARC**

	LARC uptake		OR (95% CI)	P
	Yes	No		
<b>Parity</b>				
Parity 1-2	9(5.2)	163(94.8)	1.00	
Parity 3+	9(7.3)	114(92.7)	1.43(0.55-3.71)	0.463
<b>Mode of delivery</b>				
Vaginal delivery	13(4.9)	251(95.1)	1.00	
Caesarean section*	5(16.1)	26(83.9)	3.71(1.23-11.24)	0.02
<b>Baby's sex</b>				
Baby boy	9(5.9)	143(94.1)	1.00	
Baby girl	9(6.3)	134(93.7)	1.07(0.41-2.77)	0.894
<b>Outcome of baby at delivery</b>				
Alive	17(5.9)	270(94.1)	NA	NA
Died	0(0.0)	1(100.0)		
<b>Ideal family size</b>				
1 to 2	1(5.0)	19(95.0)	1.00	
3 and above	17(6.2)	257(93.8)	1.26(0.16-9.96)	0.829
<b>Was last pregnancy planned?</b>				
Yes	14(5.9)	223(94.1)	0.82(0.26-2.58)	0.729
No	4(7.1)	52(92.9)	1.00	
<b>Plan to have another child?</b>				
Yes	15(6.0)	237(94.0)	0.80(0.22-2.90)	0.736
No	3(7.3)	38(92.7)	1.00	
<b>Already resumed sexual activity</b>				
Yes	13(12.0)	95(88.0)	4.84(1.68-14.00)	0.004
No	5(2.7)	177(97.3)	1.00	

There was a significant association between LARC uptake and both mode of delivery ( $p = 0.02$ ) and immediate resumption of sexual activity ( $0.004$ ), Table 7. LARC uptake was significantly higher among women who delivered through caesarean (16.1%) compared to those delivering through SVD (4.9%), OR 3.71; 95% CI 1.23-11.24. Women who had resumed sexual activity were 4.8 times more likely to report LARC uptake compared to those who had not resumed sexual activity (12% versus 2.7%, OR = 4.84, 95% CI 1.68-14.0).

LARC uptake was not significantly associated with parity ( $p = 0.463$ ), plans to have another child ( $p = 0.736$ ), or maternal report of ideal family size ( $p = 0.829$ ), Table 7.

**Table 8: ANC attendance during previous pregnancy and LARC uptake**

	LARC uptake		OR (95% CI)	P
	Yes	No		
<b>Attended ANC during last pregnancy</b>				
Yes	18(6.4)	263(93.6)	NA	NA
No	0(0.0)	12(100.0)		
<b>Discussed with ANC provider about FP</b>				
Yes*	15(10.1)	133(89.9)	5.15(1.46-18.20)	0.011
No	3(2.1)	137(97.9)	1.00	
<b>Decided on FP method to use</b>				
Yes*	17(23.9)	54(76.1)	68.94(8.98-529.51)	<0.001
No	1(0.5)	219(99.5)	1.00	

Most women attended ANC during the previous pregnancy including all 18 (6.4%) who reported LARC uptake and 267 (93.6%) who did not take up LARC (Table 8). None of the 12 women who did not attend ANC reported LARC uptake. There was a significant

association between LARC uptake and having discussed FP with ANC provider (10.1 versus 2.1%). Participants who had decided on an FP method during ANC were more likely to report LARC uptake (23.9% versus 0.5%).

### Participant knowledge and LARC uptake

**Table 9: Participant knowledge and postpartum uptake of LARC**

	LARC uptake		OR (95% CI)	P
	Yes	No		
<b>Ever receiver prior FP counselling</b>				
Yes*	17(13.2)	112(86.8)	25.04(3.29-190.89)	0.002
No	1(0.6)	165(99.4)	1.00	
<b>Ever used any FP method</b>				
Yes*	16(23.2)	53(76.8)	33.81(7.54-151.55)	<0.001
No	2(0.9)	224(99.1)	1.00	
<b>Ever discussed FP with partner</b>				
Yes*	17(17.0)	83(83.0)	39.12(5.12-298.82)	<0.001
No	1(0.5)	191(99.5)	1.00	
<b>Husband approves use of FP</b>				
Yes*	15(15.2)	84(84.8)	11.49(3.24-40.74)	<0.001
No	3(1.5)	193(98.5)	1.00	
<b>Ever used implant</b>				
Yes	16(50.0)	16(50.0)	1.00	
No	2(0.8)	261(99.2)	0.01(0.00-0.04)	<0.001

There were significant associations between LARC uptake and prior FP counselling (p = 0.002), prior FP use (p < 0.001), ever discussing FP with partner (p < 0.001), husband approval of FP use (p < 0.001) and previous implant insertion (p < 0.001).

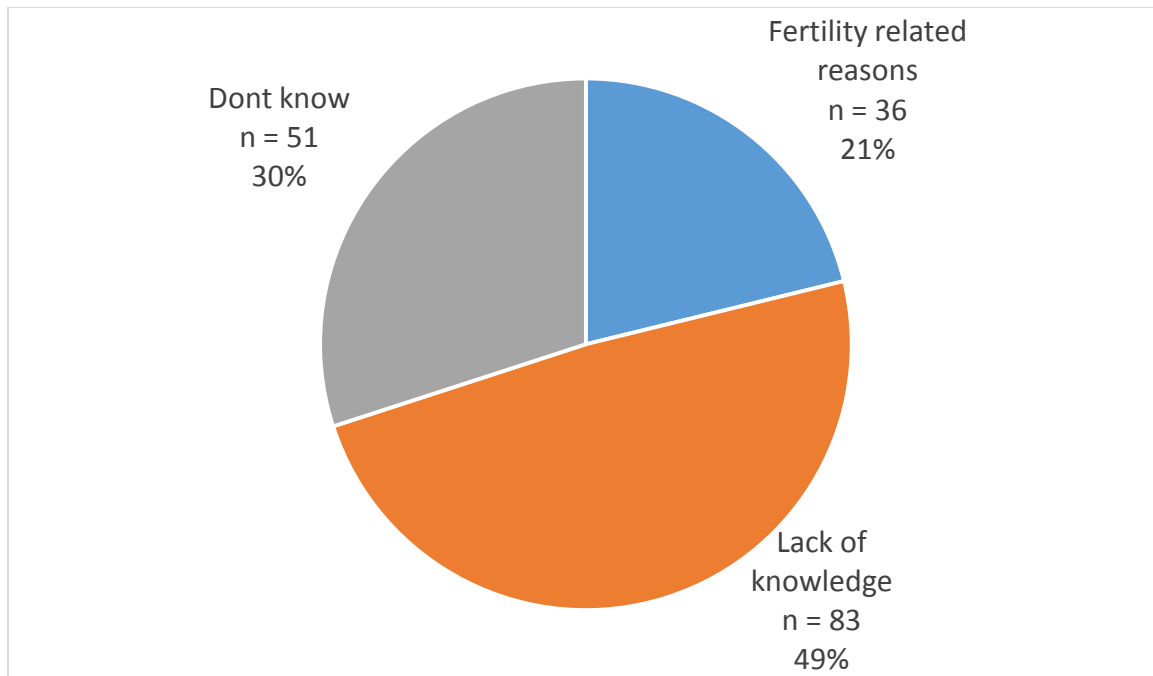
## Opinion about LARC

**Table 10: Opinion regarding FP methods and association with LARC uptake**

	LARC uptake	
	Yes	No
<b>Opinion about IUD and implants</b>		
I know it is a good method	16(22.5)	55(77.5)
I heard it is a good method	2(3.2)	60(96.8)
Heard it is a bad method	0(0.0)	44(100.0)
I don't know about it	0(0.0)	111(100.0)

LARC uptake was associated with client opinion regarding FP methods (Table 9). Most clients reporting LARC uptake also said that they knew LARC was a good method (16/ 18). The remaining two clients reporting LARC uptake indicated that they had heard that LARC is a good method.

There were 39 (13.2%, 95% CI 9.3-17.1%) mothers reporting that they were currently using FP methods. Figure 2 shows that most 83 (49%) mothers who did not use any FP methods said that they lacked knowledge on family planning issues and 36 (21%) had concerns related to impact of FP on fertility



**Figure 2: Reasons for failure to use contraceptives in the postpartum period**

The findings of the multivariable analysis are presented in Table 11. Mode of delivery was not significantly associated with LARC uptake after adjusting for the effect of having discussed FP with ANC provider, ever using any FP method, resumption of sexual activity, and religion. There was weak association between level of education and LARC uptake in the adjusted analysis.

**Table11: Multivariable analysis of factors associated with LARC uptake**

	LARC uptake		Adjusted OR (95% CI)	P
	Yes	No		
<b>Discussed with ANC provider about FP</b>				
Yes*	15(10.1)	133(89.9)	5.3(1.32-18.7)	0.023
No	3(2.1)	137(97.9)	1.00	
<b>Ever used any FP method</b>				
Yes*	16(23.2)	53(76.8)	28.9(6.2-137.1)	0.001
No	2(0.9)	224(99.1)	1.00	
<b>Already resumed sexual activity</b>				
Yes	13(12.0)	95(88.0)	5.5(1.7-13.3)	0.001
No	5(2.7)	177(97.3)	1.00	
<b>Mode of delivery</b>				
Vaginal delivery	13(4.9)	251(95.1)	1.00	
Caesarean section	5(16.1)	26(83.9)	3.1(0.89-14.2)	0.082
<b>Religion</b>				
Christian	12(4.7)	246(95.3)	1.00	
Muslim*	6(18.8)	26(81.3)	4.6(1.5-14.1)	0.01
Others	0(0.0)	5(100.0)	NA	
<b>Education level</b>				
None	2(2.4)	80(97.6)	1.00	
Primary	2(2.0)	97(98.0)	0.9(0.1-6.3)	0.86
Secondary	7(8.2)	78(91.8)	3.7(0.69-17.9)	0.12
College/university*	7(24.1)	22(75.9)	12.5(2.3-67.1)	0.008

## CHAPTER FOUR

### DISCUSSION

The high unmet need for postpartum contraception had been demonstrated in sub-Saharan African countries and remains a major concern due to the negative impact of unintended and closely spaced pregnancies on outcomes of mothers and babies. This study aimed to determine the rate of LARC uptake among postpartum women in South Sudan and to identify the factors influencing uptake. The study found that the prevalence of LARC uptake was low 6.1%(95%CI 3.7 to 9.5%), and that uptake was associated with ANC FP counselling, partner involvement, prior use of contraception, education, occupation, religion, mode of delivery and resumption of sexual activity. The association between LARC uptake and demographic factors was not as strong as that seen for the factors listed above. The uptake of 6.1% is higher than that found in the national(48) prevalence of all FP methods(4.7%), with use of modern contraception standing at 1.7% among all women this may be due to increased demand for implants from clients as a result of ANC & PNC counselling.

The barriers to uptake of LARC methods amongst postpartum women at Juba teaching hospital include lack of family planning knowledge and low rate of family planning counselling to the postpartum mothers at the postpartum clinic.

These results were consistent to the statistics form Department of Public Health, Thailand found that implant was the most common method of LARC used in Thai postpartum women(49)



Our findings are similar to the study by Chansin W, et al., Bangkok, 2012 who found that 8.4% of postnatal women utilized LARC within 12 weeks postpartum (49) Postpartum LARC uptake reported in this study is low (6.1%) but consistent with other studies in literature(50). This findings consistent with recent regional demographic health surveys in 27 African countries(51) that show that overall postpartum contraceptive uptake is 18%. The estimated uptake for a LARC methods (6%) is within the range of overall uptake (18%) reported in these in national surveys implying that approximately one in every three women initiating contraceptive use in the postpartum period will use LARC.

There are few studies that report LARC uptake in general postpartum populations within Africa and even lower rates of LARC uptake have been reported in studies targeting specific populations. For example, in Malawi a study by Michele et al about LARC use among HIV postpartum women. In this population of postpartum Malawian women, HIV-infected women were more likely to report that their most recent pregnancy was unintended, and more likely to desire no more children, therefore LARC was reported higher among HIV infected postpartum women compared to non infected women(52)

At the global level 13.3% of American mothers randomized to the control arm of postpartum educational intervention utilized LARC at 12 weeks(53). This uptake is twice that seen in the present study, the difference in LARC uptake could be explained by either of two factors namely: the short period of follow up (12 weeks) as compared to longer follow up in this study, and health system differences in the developed and developing country setting.

Our study is similar to previous study at Mbagathi & Naivasha districts hospitals 2014 by Mufida et al reporting young maternal age and school attendance but not occupation were

significantly associated with LARC uptake among postpartum women (54)

There was a significant association between LARC uptake and both mode of delivery and resumption of sexual activity. LARC uptake was significantly higher among women who delivered through caesarean compared to those delivering through SVD. Findings from the study at a Military facility in Virginia agreed with our findings. The Virginia study found that caesarean delivery and sexual resumption were significantly associated with LARC used among postpartum women at 8-12 week.

There was a significant association between LARC uptake and education. Mothers with tertiary education were 12 times more likely to use LARC compared to those with no education.

Religion was also associated with uptake with Muslim women having higher uptake compared to Christian women by *Osuafor et al in Nigerian 2015*, stated that; religion significantly associated with LARC use, but found contrary in context whereby; Christians are more likely to use LARC than their Muslim counterparts. The same study also shows that other factors that influence use of LARC include education and occupation of women and number of living children(55).

There were significant associations between LARC up take and prior FP /LARC use, spouse support and previous implant insertion. According to Ashford (2003) postpartum women who have used contraceptives in the past and intend to use them in the future are more likely to use contraceptives than those who have not used contraceptives in the past. A study done in Iran revealed that both prior implant use and spouse support were significant factors influencing LARC uptake among postpartum women (Tehrani, et al, 2001).

There was a significant association between LARC uptake and having discussed FP with

ANC provider. Participants who had decided on an FP method during ANC were more likely to report LARC uptake (23.9% versus 0.5%). Studies conducted in Kenya and South Africa observed an increased utilization of postpartum family planning following interventions to increase awareness (Mwangi et al, 2008; Hani et al, 2003)(56). Therefore, increasing the information provided on the methods available following delivery has a strong influence on the women's decisions to use postpartum family planning.

## **Conclusion**

This study had demonstrated that uptake of LARC among postpartum women in Juba Teaching Hospital is low with 6.1% of the mothers reporting uptake. LARC uptake was associated with knowledge of FP methods and prior use of these methods, ANC FP counseling, discussion with and approval of FP use by spouse, mode of delivery, resumption of sexual activity and religion.

Strengths of our study include large population size and this is the first study in South Sudan that determines the LARC uptake in the postpartum period.

## **Recommendations**

Future studies to determine how to increase the low reported uptake of LARC among postpartum women. Health providers in setting with low education levels should focus FP messages to less educated mothers. Health workers should provide contraceptive education in the ANC and postnatal period.

Having this been the first study of its kind in South Sudan. We recommend further study to include facility factor analysis, information regarding breast feeding patterns

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## **APPENDICES**

### **ANNEX 1-CONSENT FORM FOR INTERVIEWS**

**FACTORS ASSOCIATED WITH UPTAKE OF LONG ACTING REVERSIBLE CONTRACEPTIVES METHODS AMONG POSTPARTUM WOMEN AT JUBA TEACHING HOSPITAL**

Principal investigator: Dr Kennedy S. L Busse

**+254717443124, +211955481491**

#### **Introduction**

I am Dr Kennedy S. L Busse. I am a postgraduate student at University of Nairobi, department of obstetrics and gynaecology. I am conducting a study to determine the factors that determine the use of long acting reversible contraceptives methods among women attending the maternal child health clinic at Juba teaching hospital.

#### **Purpose**

The study seeks to establish the factors that determine the use of long acting reversible contraceptive methods among the women attending the maternal child health clinic at Juba teaching hospital.

#### **Procedure**

If you agree to participate in the study you will be asked questions after you have been attended to by a health care provider. The nature of the questions will be about socio-demographic, reproductive, and family planning knowledge.

Note that it is your right to decide whether to participate in the study or not. Your refusal to participate will not interfere with the services you are getting currently at the Juba teaching hospital.

#### **Benefits of the research**

Some of the benefits of the study include counselling on available contraceptive methods and appropriate referrals for those wishing to commence a family planning method of choice.

#### **Potential risks**

There are no risks anticipated in this study. However, the interview will take a few of your minutes. You are assured that the information you will offer will not be linked to you directly and your personal details will not be revealed to any person.

### **Voluntarism**

It is your right to decide if you want to participate in the study or not. Your decision will not interfere with the services you are provided at Juba teaching hospital.

### **Further information**

If you have any question regarding the study, you can contact Dr Kennedy S. L Busse through telephone number=211955481491, +254717443124, [busskennedy@gmail.com](mailto:busskennedy@gmail.com)

You may also contact the Juba teaching hospital ethics committee=+211912401827

Your participation in the study is highly appreciated

### **Respondent's statement**

I conform that this study has been explained to me and all the questions satisfactorily answered by interviewer.

Signature\_\_\_\_\_date\_\_\_\_\_

### **Researcher's statement:**

I conform that I have exhaustively explained the study to the participant and sought voluntary informed consent from her.

Signature \_\_\_\_\_date \_\_\_\_\_

University of Nairobi Ethics and Research Committee

Hospital Road along Ngong Road

P.O. Box 20723 Code 00202

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Telephone 2726300 Ext 44355

Email: [uonknh\\_erc@uonbi.ac.ke](mailto:uonknh_erc@uonbi.ac.ke)

Website: [www.uonbi.ac.ke/activities/KNHUoN](http://www.uonbi.ac.ke/activities/KNHUoN)

Secretary, KNH/UON-ERC: PROF, A.N. GUANTAI

## ANNEX II.QUESTIONNAIRRE

**STUDY TITLE: FACTORS ASSOCIATED WITH UPTAKE OF LONG ACTING REVERSIBLE CONTRACEPTIVES METHODS AMONG POSTPARTUM WOMEN AT JUBA TEACHING HOSPITAL**

**Serial number.....**

### SECTION 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. What is your age in complete years?

2. What is your religion?

Christian  Muslim  others

3. What is your marital status?

Married  Single  Widowed  Divorce/separated  Cohabiting

4. What is the highest level of School attended?

None  primary  secondary  college/university  above

5-Residence

Urban  Rural

6. What is your occupation?

Unemployed/house wife  self-employed/business  salaried employment

Casual  still in the school/college/university

7. What is the age of your spouse in complete years?

8. What is the highest level of school attended by your spouse?

None  Primary  Secondary  College/university  above

9. What is the current occupation of your spouse?

Unemployed  self-employed/business  salaried employment

Casual labourer

**SECTION 2 REPRODUCTIVE CHARACTERISTICS**

1. Parity

1-2  3 and above

2. When did you delivered? ....numbers of weeks

3. What was the mode of delivery?

Vaginal delivery  caesarean section

4. What is the outcome of delivery?

Baby boy  Baby girl  Alive  Died

5. How many living children do you now have after this last delivery?

6. How many of these are: Boys  Girls

7. How old were you when you became pregnancy for the first time?.....

8. In your opinion the ideal family size should have how many children?

1-2

3 and above

9. Did you plan for the last pregnancy? Yes  No

10. Have you plan to have another child after this? Yes  No

11. If yes how soon would you wish to become pregnant again? NOs of years

12. Do you already resume sexual activity? Yes  No

13. If no how soon do you think you will resume sexual activity? Numbers of months

14. Did you attend ANC during last pregnancy? Yes  No

15. If yes, during ANC or PNC did you discuss with your health provider about FP?  
Yes  No

16. Did you decide on which FP methods you were going to use?  
Yes  No

17. If yes, which of these methods did you decides to use?  
Female sterilisation  Pills  IUD  implants

Inject able  Condoms

Others specify.....



**SECTION 3: CONTRACEPTIVES**

1. Do you know any contraceptive methods? Yes  No

2-If yes, which FP method do you know?

Sterilization  pills  IUD  Implants

Injectables  Condoms

Others specify.....

3. Have you ever received prior FP counselling? Yes  No

4. Have you ever used any methods? Yes  No

5. If yes, which of these methods did you use?

Pills  IUD  Implants  injectables  Condoms

Others specify.....

6. Are you using any FP method right now? Yes

7. If yes, which method are you on? .....

8. If no why?

Fertility related reasons  lack of knowledge  don't know

Other, (specify).....

9. Have you ever discuss FP with your husband/partner? Yes  No

10. Does your husband/partner approve use of FP to avoid pregnancy? Yes  No

11. Have you ever heard of?

Intrauterine contraceptive device/ coils: Yes  No





### ANNEX III: WORK PLAN

	Aug/ 15	Sep/ 15	Oct- Dec/ 15	Apr- May/ 16	Jul/ 16	Aug/ 16	Sep/ 16	Oct/ 16	Nov/ 16
Proposal writing presentation to the faculty									
Submission for ethics review/KNH&UoN									
Data collection									
Data analysis									
Submission of draft report to supervisors for their review									
Results presentation to the faculty									
Dissertation submission to faculty for review									
Incorporation of comments from faculty and binding									

## ANNEX IV: BUDGET OF THE STUDY

No.	Descriptions	units	Amount US \$	Total \$
A	<b>Stationeries:</b>			
	Ream of sheet	3	5	15.00
	Staple Machine and pins	5	2	10.00
	perforator	2	2	4
	Pens(packs)	2	2	4
B	<b>Supplies :</b>			
	Printer	1	300	300.00
	Ink	10	20	200.00
C	<b>Personnel :</b>			
	Statistician	1	350	350.00
	Research assistants	5	150	750.00
D	<b>Ethics:</b>			
	UoN/ KNH-ERC		25	25.00
E	<b>Training :</b>			
	Ream of sheet	1	10	10.00
	Flip chart	1	20	20.00
	Mark pens	5	1	5.00
	Food	10	20	200.00
	Drinks	10	15	150.00
	<b>Total</b>			2,043

- No funds were given to any client for participation