ASSOCIATION OF INTENDED BIRTH TO PREGNANCY INTERVAL AND UPTAKE OF IMMEDIATE POSTPARTUM LONG ACTING REVERSIBLE CONTRACEPTIVE METHODS AT THIKA LEVEL 5 HOSPITAL

(A Prospective Cohort Study)

DR. BRUCE OTIENO SEMO

H58/81048/2015

A DISSERTATION IN PART FULFILLMENT FOR THE DEGREE OF MASTER OF OBSTETRICS AND GYNEACOLOGY

UNIVERSITY OF NAIROBI

DECLARATION

This dissertation is my original work and has not been presented for the award of a degree in any other University.

Signed..... Date.....

Dr. Bruce Otieno Semo, MBChB

Department of Obstetrics and Gynecology, University of Nairobi

SUPERVISORS:

Signed..... Date.....

Prof. Muia Ndavi, MBChB, MMed (Obs/ Gynae), FHBR, DLSHTM, MSc (Epidemiology)

Associate Professor of Obstetrics and Gynecology

Department of Obstetrics and Gynecology, University of Nairobi

Signed…… Date…….

Dr. Anne.B. Kihara MBChB MMed (Obs/Gynae)

Senior lecturer

Department of Obstetrics and Gynecology, University of Nairobi

Signed…… Date……

Dr. Benjamin Elly Odongo, MbChB MMed (Obs/Gynae)

Clinical Fellow (gyn/onc)

President KOGS, PI (KOGS/MOH/FIGO PPIUD PROJECT)

Signed…… Date…….

Dr. Alex Bosire, MBChB, MMed (Obs/ Gynae)

Lecturer

Department of Obstetrics and Gynecology, University of Nairobi

Acknowledgment

I would like to express my sincere appreciation to;

- My supervisors Dr. Anne Beatrice Kihara her attention to detail and encouragement throughout the study period, professor Muia Ndavi, Dr. Alex Bosire and Dr Benjamin Elly Odong'o for their invaluable input during the whole study process.
- My colleagues in the Mmed (Obstetrics and Gynecology) program for their input and constructive criticism
- The statistician, Dr Barasa Wekesa for his relentless effort, teachings and patience in the whole process.
- The Kenya Obstetrical and Gynecological Society of Kenya for their technical and logistical support during the whole process.

Table of Contents

TITLE ..... *i*

DECLARATION ii

SUPERVISORS: ii

Acknowledgment ..... *iii*

List of figures ..... *vi*

List of tables ..... *vii*

ABBREVIATIONS ..... *viii*

OPERATIONAL DEFINITIONS ..... *ix*

Abstract ..... *x*

background x

Objective x

Methodology x

Results x

Conclusion xi

recommendation xi

1. INTRODUCTION *1*

1.1. Background of study 1

1.2. Contraceptive implants 3

1.3. Intrauterine devices 4

2. LITERATURE REVIEW *5*

3. CONCEPTUAL FRAMEWORK *9*

Elaborate conceptual framework 9

4. STUDY JUSTIFICATION. *10*

5. RESEARCH QUESTION *11*

6. RESEARCH OBJECTIVES *11*

6.1. BROAD OBJECTIVE 11

Null hypothesis 11

6.2. SPECIFIC OBJECTIVE 11

7. RESEARCH METHODOLOGY *12*

7.1. STUDY DESIGN 12

7.2. STUDY SITE 12

7.3. STUDY POPULATION 13

7.4. INCLUSION CRITERIA 13

7.5. EXCLUSION CRITERIA 13
7.6. SAMPLE SIZE DETERMINATION 14
7.7. Patient recruitment procedure 15
7.7.1. Consenting 16
7.7.2. Counseling on contraceptive methods 16
..... 17
7.8. DATA COLLECTION 17
7.9. DATA QUALITY ASSUARANCE 17
7.10. Data analysis 18
8. ETHICAL CONSIDERATIONS 20
9. RESULTS 21
9.1. Description of the study population 21
9.2. Socio-demographic characteristics of the study participants 21
9.3. Reproductive characteristics 22
9.4. Association between exposure variables and uptake of IPPLARC 24
9.5. Uptake of immediate postpartum contraceptives 26
10. DISCUSSION 28
11. CONCLUSION 32
12. RECOMMENDATION 32
13. STUDY LIMITATIONS 33
14. REFERENCES 34
15. APPENDICES 37
15.1. APPENDIX 1: CONSENT FORM 37
15.2. APPENDIX 2: QUESTIONAIRE 42
15.3. APPENDIX 3: CHECKLIST FOR IMMEDIATE POST PARTUM IUCD AND TWO-ROD CONTRACEPTIVE IMPLANT INSERTION 46
15.4. APPENDIX 4 CHECKLIST FOR IMMEDIATE POSTPARTUM INSERTION OF CONTRACEPTIVE IMPLANT 49
15.5. Approval letter from ethics committee 51

List of figures

Figure 1: Conceptual Framework 9

Figure 2: Recruitment of participants 17

Figure 3. Consort flow diagram 21

Figure 4 Average proportion of parity and number of pregnancies lost. 23

Figure 5 Uptake of immediate postpartum long acting reversible contraceptives 26

List of tables

Table 1: Estimates of the 1-year life table perfect and typical use failure rates for short acting and long acting reversible methods of contraceptives. 3

Table 2. Socio-demographic characteristics of the study participants 22

Table 3. Mean age at menarche and first sexual debut 23

Table 4. Association between intention to delay pregnancy, prior knowledge about IPPLARC, reproductive and socio-demographic characteristics and uptake of IPPLARC 25

Table 5 Association of post-partum contraceptive knowledge and intention to delay subsequent pregnancy 27

Table 6. Logistic regression for statistically significant variables associated with uptake of IPPLARC. 27

ABBREVIATIONS

ANC	Antenatal clinic
C.S	Caesarean section
SVD	Spontaneous vaginal delivery
HIV	Human Immunodeficiency Virus
IPPIUCD	Immediate post-partum intrauterine contraceptive device
IUCD	Intrauterine contraceptive device
KNH	Kenyatta National Hospital
LARC	Long acting reversible contraceptive methods
MEC	Medical eligibility criteria
ROM	Rapture of membranes
SVD	Spontaneous vaginal delivery
TLFH	Thika Level Five Hospital
WHO	World Health Organization
KOGS	Kenya Obstetrical and Gynecological Society
IPPLARC	Immediate postpartum long acting reversible contraceptives.

OPERATIONAL DEFINITIONS

1. **Latent phase of labor**: Early phase of labor characterized by uterine contractions with cervical dilatation less than 4 centimeters.
2. **Peripartum period**: The period shortly before, during, or immediately after child birth
3. **Family planning:** The use of contraceptives to achieve the desired number of children, spacing of births and timing of pregnancies by individuals or couples.
4. **Post-partum period:** The period immediately after delivery of the placenta extending up to 6 weeks after delivery.
5. **Postpartum contraception:** The initiation and use of family planning method within the first twelve months after delivery
6. **Immediate postpartum contraception:** The initiation and utilization of family planning method within forty-eight hours of delivery.
7. **Rapid repeat pregnancy:** Pregnancy onset within 24 months of previous pregnancy.

Abstract

background

Contraceptives reduce the number of high-risk pregnancies, high parity births and unintended pregnancies therefore playing a major role in reducing maternal and perinatal deaths. Globally, the unmet need for family planning during the postpartum period is high despite the available methods of immediate postpartum contraception and the prime opportunity to administer the contraceptives during this period. Rapid repeat pregnancy is associated with increased maternal and perinatal morbidity and mortality.

Objective

The study aimed to determine the association between women's desire to achieve an inter-pregnancy interval of 2 years or more and uptake of immediate postpartum LARC in an urban public hospital.

Methodology

This was a prospective cohort study conducted at Thika level Five Hospital in Kiambu County, Kenya. A total of 1489 women in the latent phase of labor were recruited and segregated into two groups; those who intend to conceive in less than two years after delivery and those who intend to delay the next conception by two years or more. The women were followed up till they delivered and offered contraceptives within 24 hours. Data was collected for analysis. Summary statistics was performed on intent to delay pregnancy, reproductive and demographic characteristics and presented in charts and tables. Inferential statistics: association of inter-pregnancy interval, utilization of immediate post-partum LARC and other variables were compared. Relative risks have been calculated. A p-value of <0.05 is considered to be significant.

Results

Women who intend to delay their subsequent pregnancy by 2 years or more are likely to utilize long acting reversible contraceptive methods compared to those who intended to get pregnant in less than 2 years, OR 2.86 (95% CI 1.89 – 4.33) p-value <0.0001

The proportion of women taking up immediate post-partum long acting reversible contraceptives among those with intention to delay pregnancy by 2 years or more was 21.9% while those with no intention to delay their subsequent pregnancy by 2 years was 8.9%.

Women with knowledge about the types of immediate post-partum contraceptives were more likely to accept it in the post-partum period than those with no knowledge. (OR 1.93) P value <0.0001.

Conclusion

The uptake of immediate postpartum long acting reversible contraceptives is higher in this study population compared to other low- and middle-income countries.

The intention for an optimum interpregnancy interval of 2 years or more increases the odds of utilizing immediate postpartum long acting reversible contraceptives by up to three times.

Knowledge about available contraceptive options in the immediate postpartum period increases utilization during this period

Recommendation

Policy and advocacy for reproductive planning with an optimum inter-pregnancy interval towards 2 years and more should be instituted as a crucial intervention in increasing uptake of immediate post-partum long acting reversible contraceptive.

Institutionalizing provision of immediate post-partum long acting reversible contraceptives to increase contraceptive uptake should be encouraged.

More studies should be done on the relationship between optimum inter pregnancy interval and utilization of immediate postpartum contraceptives with an aim of exploiting the relationship to increase family planning uptake

1. INTRODUCTION

1.1. Background of study

Postpartum contraception is the prevention of unwanted pregnancies and closely spaced pregnancies throughout the first twelve months following delivery.[1] The peripartum period provides a unique opportunity for health workers to provide information and allow women to make informed choices on postpartum contraception. Community education, antenatal care, Labor and delivery have been suggested as an opportune contact period between health service providers and patients for integration of family planning services[2]. This may include counseling to address fertility desires and family planning needs. Women who seek immediate postpartum contraception may undergo counseling and the service provided thus averting missed opportunities later on in life.[1]

Closely spaced pregnancies is a risk factor adverse maternal and neonatal outcomes with studies showing increased maternal and perinatal mortality and maternal morbidity including; premature rupture of membranes, anemia in pregnancy, puerperal endometritis, increased risk of scar dehiscence and uterine rapture among women with a previous caesarian scar, perinatal complication including prematurity, fetal death, low birth weight and small for gestational age[3]. According to the World Health Organization, the recommended birth to pregnancy interval with evidence of better pregnancy outcome is 24 months. [1]

According to data analyzed from 27 countries on demographic health, 95% of women who are 0 to 12 months postpartum want to avoid a pregnancy in the next 24 months.(4) However, only 30% were found to be using contraceptive methods. The large unmet needs for family planning among women of reproductive age group leads to unplanned pregnancies, a major contributory factor to maternal morbidity and mortality in the developing world and it could be higher during the postpartum period.

The prevalence of contraceptive use among women of reproductive age group using contraceptives in Kenya is 42.6% with a contraceptive prevalence rate of 58%. The unmet need for family planning in Kenya stands at 18% among married women and is even higher in the immediate postpartum period. The percentage of births delivered in health facility stands at

61.2%.[5] The postpartum period thus provides a unique opportunity to offer contraceptive services and increase the contraceptive uptake especially if the barriers are addressed.[5]

While closely spaced and unplanned pregnancies have been shown to pose great health danger to both the mother and child, family planning also plays a crucial role in a country's development with regards to opening demographic window and achieving sustainable development goals. Interventions that improve contraceptive uptake need to be promoted and supported nationally.[6]

Long acting reversible contraceptives (LARC) include contraceptive implants and intrauterine devices (progesterone laden intrauterine device and copper T intrauterine device). They have been shown to be safe, effective and convenient since they don't require clinician follow up for effectiveness. They also have a lower rate of discontinuation than reversible methods, with no reports of adverse effects associated with estrogen. [7][8]

Short acting contraceptives include the combined hormonal pill, progestogen only pill, contraceptive patch, contraceptive ring, progestin only Injectable and monthly Injectable.

The effectiveness of a contraceptive depends on several factors. These include the user factors like woman's age, fertility, other co morbid conditions, correct usage of the contraceptive and strength of the different types of contraceptive. There are several methods used to measure the effectiveness of a contraceptive, the typical method used is in terms of failure rates, this is recorded as either the typical use or perfect use failure rate. [9][10] The typical use failure rate is defined as the number of pregnancies occurring when the contraceptive is used both correctly and incorrectly per 100 women thus reflecting the actual use in real life and the perfect use is the number of pregnancies occurring in a setup of consistent and correct use at all times per 100 women.

In the past, contraceptive efficacy was measured using the pearl index. This is defined as the number of pregnancies that occur recorded per 100 women years where one-woman year is defined as a total of 13 menstrual cycles. This method however had a drawback in that it did not take into account the change in pregnancy risk that occurred in a group of women over time.[9][10]

The short acting contraceptives have a wide variation between perfect use and typical use failure rate making them less effective in preventing unplanned pregnancies compared to the long acting reversible contraceptive. A table comparing the typical use and perfect use failure rate of different types of contraceptives has been provided in table 1.[11] The LARC methods show negligible difference between the typical and effective use with the Mirena (levonorgestrel

intrauterine system) and the Implanon (Etonogestrel implant) showing no difference between the typical use and perfect use failure rate. [12]

Table 1: Estimates of the 1-year life table perfect and typical use failure rates for short acting and long acting reversible methods of contraceptives.

METHOD	TYPICAL USE (%)	PERFECT USE (%)
No method	85	85
Diaphragm	12	6
Combined pill and progestin-only pill	9	0.3
Evra patch	9	0.3
NuvaRing	9	0.3
Depo-Provera	6	0.2
Intrauterine contraceptives;		
ParaGard (Copper-T)	0.8	0.6
Mirena (LNg IUS)	0.2	0.2
Implanon	0.05	0.05
Female sterilization	0.5	0.5
Male sterilization	0.15	0.10

1.2. Contraceptive implants

Contraceptive implants are long acting reversible forms of contraception consisting of progesterone laden rods placed in the upper inner arm.

There are four main types of implants available:[10]

- *Jadelle*. This is a contraceptive implant with two rods containing 75 milligrams (mg) of with levonogestrel with efficacy lasting for 5 years.
- *Implanon* consists of 1 rod containing 68mg of etornogestrel with peak efficacy of three years.
- *Levoplant* consists of two rods with 75mg of levonogestrel with an efficacy of up to 4 years.
- *Norplant*. This is an old type of implant no longer in use. It was made up of six capsules containing 36mg of levonogestrel inserted in the inner aspect of the arm. It was however

withdrawn from the market with the advent of newer and more efficacious modern implants.

The contraceptive acts by inhibition of the pituitary gonadotropins thus inhibiting ovulation. The progesterone also increases the viscosity of the cervical mucus thus inhibiting passage of sperms and also alters the lining of the uterus thus impairing implantation.

Some of the complications associated with implants include; pain during insertion with irritation/allergy to the rods, Weight gain, headaches, gastrointestinal disturbance, acne, and abnormal bleeding patterns. [(7)] implants have been shown to provide 99.9% protection against pregnancy with protection occurring 24hrs after implant insertion.[(6)]

The progesterone implants have been shown to be effective and can be used in the immediate postpartum period.[(13)]

1.3. Intrauterine devices

Intrauterine devices (IUD) comprise of different types of flexible plastic devices that are inserted into the uterine cavity to prevent pregnancy. There are two types; copper based and hormonal based devices. The hormone releasing devices are less available in Kenya public facilities. The hormonal form acts by releasing a progestin (levonorgestrel) which causes thinning of the endometrial lining thus preventing ovulation and altering fertilization by interfering with sperm transport.

The copper-based devices come in several forms but the commonly available form in public health facilities is the CU380A device. They act by releasing copper which causes a chemical change that makes the sperm and ova non-viable, they also make the endometrium unreceptive through the foreign body effect.[(6)]

Long acting reversible contraceptives can be administered during the immediate postpartum period to women who meet the medical eligibility criteria and desire to have immediate contraception. The intrauterine contraceptive device can be inserted during the postpartum period, within 48hrs of delivery (immediate postpartum LARC insertion) or 4 to 6 weeks after delivery (interval placement of LARC). [(13)] In some selected cases, it can be given in the post abortion period[(14)]. Immediate postpartum insertion has been to shown to have a higher retention 6 to 12 months post-partum compared to interval placement. The immediate post-partum LARC are efficacious, and can reduce the unmet need for family planning.[(2)]

2. LITERATURE REVIEW

LARC methods are the most effective methods of contraception, with quick return of fertility upon removal and guaranteed proper and consistent use. However, their uptake has been reported to be low in the postpartum period with the rate of uptake varying among different communities,(15) this is despite of the globally high unmet need for family planning in the postpartum period. Several studies have been done to determine factors influencing the uptake of postpartum LARC.

Global data indicate that 61% of women aged 15 to 49years who are married or in consensual union use some form of contraception, with only 9% in high income and 18% in low income countries using LARC methods of contraception. In the United Kingdom (UK), 53% of women in the reproductive age use a reversible method of contraception with only 17% using LARC and only 14% of women who are married or in consensual union have adopted it as a method of contraception. IUD is the second most common method of contraception used worldwide. (16)

A study carried out by de Bocanegra et al in 2014 identified cohort of 117,644 women and explored the association between contraceptive method provision and the odds of achieving an optimal inter pregnancy interval. The contraceptives were classified into three groups; the long acting reversible contraceptive, the user dependent hormonal contraceptive (oral contraceptives, the contraceptive patch and contraceptive ring), and the barrier methods (condoms, diaphragms or spermicides). The results showed that out of the total number of women included the study, 64% achieved an optimal birth interval while 36% had short birth interval from the index pregnancy. A large proportion of the women (55%) used the user dependent hormonal contraceptive, 33% of the women reported having used no family planning method while only 4% used the LARC method and 7% reported use of barrier method. (17)

Logistic regression model was applied to estimate the odds of mothers who had the optimal inter pregnancy interval by the method of family planning used while controlling for the other variables that strongly influenced the inter pregnancy interval. Women who used LARC had 3.89 times the odds of an optimal birth interval than women who used the barrier methods. (Odds ratio 3.89; 95% confidence interval {CI} 3.55-4.26)

Women who received the user dependent hormonal contraceptive had significant (but lower) odds of achieving an optimal birth interval (OR1.89; 95% {CI} 1.80-1.98). Lack of

contraceptive use was associated with 0.66 times the odds of optimal birth spacing when compared to women who used the barrier method. (OR 0.66; 95% [CI] 0.63-0.69)(17)

From the findings of the above study, the uptake of LARC in the extended postpartum period has been shown to be remarkably low despite their strong association with achieving an optimum birth to pregnancy interval which is a significant factor in improvement of maternal and prenatal health. The study however did not address the factors that influence the choice of family planning use among women who intend to prevent rapid repeat pregnancy.

An observational study was carried out by M.R. Chako et al in a prenatal program in Houston, Texas, seeking to determine the methods of contraceptives that pregnant adolescents were planning to utilize in the postpartum period and to identify factors that influence intention to use methods that were less effective than LARC. Out of 249 pregnant adolescents who participated in the study, 53% were planning to utilize short or medium acting methods of birth control which included birth control pills, patches, vaginal ring and Injectable depo-medroxyprogesterone acetate, 24% were intending to use non hormonal methods which included condoms, withdrawal or sexual abstinence. The minority of the respondents 23% reported intent to use long acting reversible contraceptive methods. Among those intending to use LARC, majority 12.1% were planning to use IUD while only 6.8% were planning to use the contraceptive implant. (18)

Despite being the most effective methods of contraception, LARC methods are the least popular among teenagers in the postpartum period in the above population, this is despite the fact that LARC is the most effective method of contraception in preventing unplanned and rapid repeat pregnancies which constitute a large proportion of pregnancies among this age group.(19)

A quantitative cross-sectional study was conducted by Tefera et al in 2 hospitals south of Ethiopia in 2006 to determine the rate of acceptance and factors associated with utilization of immediate postpartum intrauterine devices. Out of 310 women selected for the study, 21.6% accepted and utilized it during the immediate postpartum period. 38% accepted it as a method of contraception but declined to utilize it in the immediate postpartum period. Among those selected for the study, only 22.8% had gone through counseling about PPIUD during the intra partum and postpartum contact periods.

The study found that 45.5% of those who accepted postpartum family planning had received counseling during early labor, 24.7% and 16.7% during the immediate postpartum period and during antenatal visits respectively.(20) Empowering the health workers with skills both in counseling and insertion of long acting reversible contraceptives during the pregnancy period influence the uptake of LARC in the immediate postpartum period.

The odds of utilizing PPIUD were more than doubled among women who did not have a plan to conceive in future in comparison to those who had a plan to conceive in future. Utilization was lower among those who were undecided compared to those who had a plan to conceive in future. Those who had no knowledge of PPIUD were less likely to utilize it compared to those who had heard about it. The findings also showed that pre-natal counseling was positively influencing the utilization of PPIUD. The intent to delay or avoid pregnancy is a significant factor and strongly associated with uptake of immediate postpartum LARC.

A cross sectional study done in two district hospitals in 2002 by Shabiby et al in Kenya aimed at determining the rate and factors influencing the uptake of immediate postpartum contraceptive implant among human immunodeficiency virus (HIV) infected and HIV uninfected women in the immediate postnatal period found that the uptake was at 50.2%. Out of 181 participants enrolled for the study, 91 were HIV positive and 94 were HIV negative. HIV positive mothers were however found to have lower acceptance of implants as a method of immediate postpartum contraception (OR 0.91 [95 % CI: 0.82-0.998], P =0.046) with an uptake of 42.9%. 23% of those who declined to take up implant as a form of contraception preferred an alternative method, 12% were afraid of the side effects while the others gave reasons related to spousal approval or needed more time to think about the contraception.(21)

Despite the benefits of long acting reversible contraceptives, their use in sub-Saharan Africa has been low with only 5% reported to be on LARC. While there is no local registry data on uptake of immediate postpartum LARC in our country, a study done in Kenya in the urban slums of Nairobi showed that the uptake of LARC during the postpartum was very low with only 4% opting for implants, while those who opted for IUD being even lower at only 2%.[7]

The low uptake of postpartum contraceptive can be explained by the partial or full protection offered by lactational amenorrhea or the sexual abstinence practiced by women in some parts of Africa. Lactational amenorrhea varies in duration of protection from 3 to 4 months and up to 20 months in sub-Saharan Africa.(7) This varied range may require family planning programs to be tailored according to the social and cultural characteristics of a community.

Few studies have shown the acceptability of immediate LARC as a method of postpartum contraception. There is insufficient data to show the factors influencing the uptake of immediate postpartum LARC in a representative population within our set up.

Out of the total number of study participants, 30.9% had less than 24 months of birth spacing from the first delivery. The mean number of births by the respondents was 3.02 (SD+-1.5) and a large proportion of the respondents (97.5%) reported having heard about LARC before. (22)

An institutional based cross-sectional study carried out by Gabramichael et al in 2013, assessed the acceptance of LARC methods and the associated factors in Meckel city, Ethiopia. Data collected from 342 women the acceptance rate of LARC at only 16.4% with 80.4% and 19.6% accepting the contraceptive implant and IUCD respectively. Among those who did not accept, 44.8% cited the fear of the side effects while 40.9% cited fear of infertility as a reason for not accepting.(23)

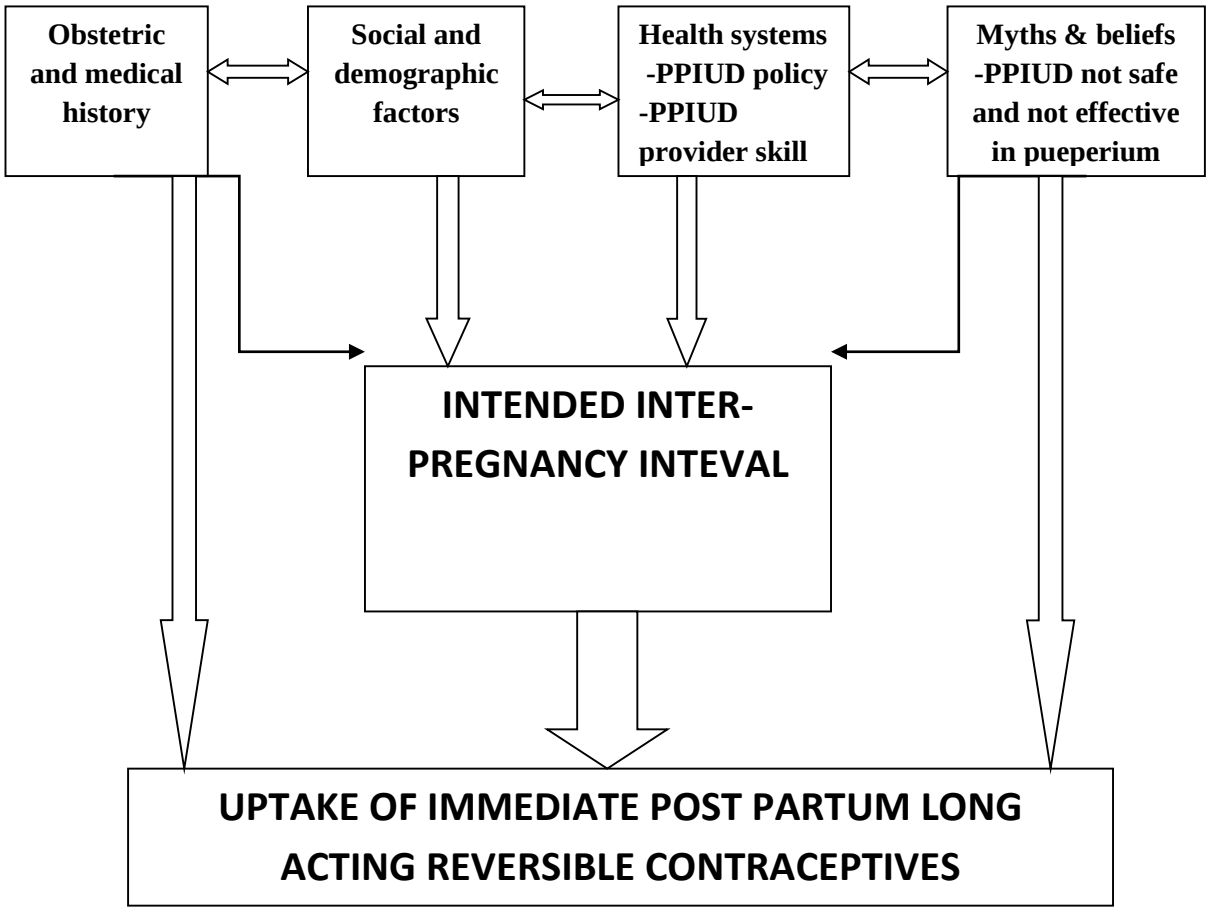
Among the respondents, 50.6% of them were knowledgeable on the correct return to fertility, 13.2% were aware that the implant would result to irregular bleeding while 10.5% reported that insertion and removal of the contraceptive implant would result to pain. 36.3% of the respondents reported that the IUCD would prevent them from doing different activities although the specific activities were not reported. Generally, the study showed that the different complications and perceived belief on LARC contraceptives influenced the rate of uptake of the different type of LARC. The impact of the specific complications on the uptake has however not been highlighted in the study. (23)

According to the demographic health survey in Kenya (KDHS) 2014, there has been a progressive increase in the number of women using modern methods of contraceptives with an uptake of 53.2%. The increase has been attributed to more women opting for implants and Injectable contraceptives with the IUCD showing the least increase in utilization among the LARC methods.(5)LARC methods in Kenya is mostly provided in public facilities including government hospitals, government health center and government dispensaries. A total of 59.9% of women using modern methods of contraceptives received them in a public hospital with 64.3% and 78.2% of IUCD and implants being sourced from the government facilities. The service is provided by nurses, clinical officers, medical officers and consultant obstetricians.[(5)] Technical skills in provision of LARC methods are thus a strong determinant in the uptake of postpartum long acting reversible contraceptive methods.

There is a large knowledge gap on LARC; their efficiency, efficacy and factors influencing their uptake in the immediate postpartum period. While majority of women seek to have an optimum inter pregnancy interval, the uptake of LARC which is strongly associated with achieving this goal is very low during this period. There are no records in national registry highlighting the uptake of immediate postpartum LARC. This study thus aims to highlight the uptake, and impact of socio demographic factors, health systems and medical/ health factors on uptake of immediate postpartum LARC in our setting.

3. CONCEPTUAL FRAMEWORK

Figure 1: Conceptual Framework



Elaborate conceptual framework

Review of literature on contraceptive choice and a relation between the different variables influencing the uptake of immediate postpartum contraception.

Demographic factors like religion, level of education of the woman and the mother, the age of the woman, her marital status and occupation influence the choice of contraception in the

postpartum period. The education level seems to be related to the awareness on the available contraceptives and the perceived believes.

The obstetric and medical history influences the appropriate type of contraceptive suitable for use according to the medical eligibility criteria which will be determined by efficient health systems through provision of counseling and availability of contraceptive services.

Efficient counseling has a strong influence on the choice of contraception, alleviating myths and believes and rightfully informing the women on the appropriate birth to pregnancy interval, and thus the appropriate choice of contraceptive.

The fertility intentions and intended birth spacing have been assessed in few descriptive studies. Most results show a causal relationship between the intended birth spacing and the choice of postpartum LARC with a strong correlation between the intent to delay pregnancy and the uptake of immediate postpartum LARC.

4. STUDY JUSTIFICATION.

There is currently limited data on uptake of immediate postpartum long acting reversible contraceptives in our country and the factors influencing the uptake. The aim of the study was to describe the pattern of uptake of immediate postpartum LARC. This has not been previously captured in our national registry.

A program that seeks to institutionalize the routine post-partum IUD service routinely has been running in the facility under The Kenya Obstetrical and Gynecological Society in partnership with Ministry of Health and FIGO, the study findings highlight the impact of the program on uptake of IPPLARC.

The information obtained from the study is useful in organizing targeted public health campaigns and advising family planning programs to ensure appropriate finance allocation.

The study provided an opportunity for the health workers to create awareness about immediate postpartum LARC which is currently under-utilized in our country due to lack of information.

5. RESEARCH QUESTION

What is the association of intent to delay subsequent birth by two years or more and uptake of immediate postpartum long acting reversible contraceptive methods among women at Thika level 5 Hospital between December 2018 to May 2019?

6. RESEARCH OBJECTIVES

6.1. BROAD OBJECTIVE

Assessment whether the intention to delay subsequent birth by two years or more is associated with the uptake of immediate postpartum long acting reversible contraceptive methods among women at Thika Level Five Hospital.

Null hypothesis

There is no association between intention to delay pregnancy for 2 years or more and uptake of immediate postpartum contraception among women delivering at Thika Level 5 Hospital.

6.2. SPECIFIC OBJECTIVE

Among the women who delivered at TLFH during the study period;

- Determine the uptake of immediate postpartum LARC methods among women who intend to delay their subsequent birth by two years or more years.
- Determine the association between women's intent to delay subsequent pregnancy by two years or more, and uptake of immediate LARC.
- Determine the uptake of immediate postpartum LARC among women who have no intention of delaying their subsequent pregnancy by 2 years or more.
- Determine whether the women who intend to delay their subsequent pregnancy by two or more years have more knowledge about immediate postpartum contraceptive methods compared to women who don't have any intention to delay their subsequent pregnancy by two years.

7. RESEARCH METHODOLOGY

7.1. STUDY DESIGN

This was a prospective cohort study in which two groups of women who presented at term gestation for delivery were informed about immediate postpartum LARC methods and invited to participate in the study. Using the JL Fleiss formulae for calculating sample size for cohort studies, a sample of 1117 women who intended to delay their subsequent pregnancy by two or more years, and 372 women who intended to conceive within two years after delivery was arrived at. The two groups were then followed from the latent phase through labor to delivery. In the immediate postpartum period, the immediate postpartum long acting reversible contraceptive methods were offered to all the women in the two groups and administered either immediately or within 48 hours after delivery to those women who expressed a desire and gave informed consent to receive them. The uptake of IPPLARC methods (administration of LARC methods after informed consent) was then determined from both groups and the association of intention to delay subsequent pregnancy by two or more years and uptake of immediate post-partum LARC was determined.

7.2. STUDY SITE

Thika level Five referral hospital serves as a teaching hospital for Kenya Medical Training College, Mount Kenya University Medical School, and a county referral hospital for Kiambu County located in Thika town.

The hospital serves a cosmopolitan population with a catchment that has blurred inter county boundaries extending to Nairobi, Kirinyaga, and Machakos averaging to about 3.5 million on average.

The hospital is located at the hub of Thika town, neighboring several colleges with a high population of women in the reproductive age group (15-49 years) and near many industries that employ a large number of people from distant areas. This has seen the hospital provide reproductive health services to a wide catchment beyond the local populace of the county.

An Initiative led by Kenya Obstetrical and Gynecological Society of Kenya (KOGS) and Ministry of Health (MOH) in conjunction with FIGO has seen institutionalization of family planning counseling during the antenatal and intrapartum period, training of health personnel and strengthening of health systems since the year 2013 to promote PPIUD services in a cost

effective way following SVD, post abortion and elective C/S for those that consent and fulfill the medical eligibility criteria.

Towards this capacity building in postpartum family planning methods; midwives, community health volunteers and medical personnel were in-cooperated in the program. Provision of antenatal and intra partum counseling with postpartum LARC administration has become a routine practice in the Institution.

During the training of health providers, the curricula included informative sessions; use of humanistic model for the LARC Methods and they have conducted more than 10 successful procedures under facilitation during the rollout program. This was followed by mentorship through observing the procedure done on patients and finally being permitted to conduct the procedures. Additional training on Infection prevention practices, danger signs, documentation and monitoring and evaluation are regularly conducted. Follow up of the patients extends from the hospital into the communities through visits conducted by community health volunteers and telephone enquiry made at six weeks postpartum. Family planning commodities for LARC are also readily accessible through the government procurement in this facility.

Patients are advised on routine antenatal visits done at two and six weeks after delivery

The hospital was chosen for the study due to the large catchment area and with diverse social-economic, religious and cultural population which makes it a busy hospital. The maternity unit has a high turnover of patient attendance with an average of seven hundred deliveries per month according to hospital records for the year 2017.

7.3. STUDY POPULATION

Women in the reproductive age group (15-49 years) admitted for delivery at term.

7.4. INCLUSION CRITERIA

- Women in the reproductive age group admitted for delivery at term in the latent phase of labor during the study timeline, who may either delivery through emergency caesarian section or spontaneous vaginal delivery.
- Women scheduled for elective caesarian section admitted for delivery at term during the period of study.

7.5. EXCLUSION CRITERIA

- Operative vaginal delivery

- A diagnosis of active phase of labor during admission.
- A known diagnosis of anatomical abnormality of the uterine cavity.
- A history of Recent or active intrauterine infection during the current pregnancy.
- A history of sexually transmitted infection during the current pregnancy.
- History of puerperal sepsis during the current pregnancy.
- A diagnosis of Postpartum hemorrhage during delivery.
- All women who do did not meet the medical eligibility criteria (MEC) for postpartum LARC insertion.
- Retained placenta that required curettage for removal.
- Rapture of membranes (ROM) 24hrs prior to delivery.
- History of breast cancer or cervical cancer.

7.6. SAMPLE SIZE DETERMINATION

The sample size was calculated using JL Fleiss (statcalc, epi – info™) sample size calculation for cohort studies with the following assumptions from a similar study on *utilization of immediate postpartum intrauterine contraceptive device and associated factors: a facility based cross sectional study among mothers delivered at a public health facility of Sidana zone, south Ethiopia*·(20)

Sample size was calculated using the difference in proportions - Fleiss JL formula (Statcalc epi-info™) as outlined below. The following assumptions were considered during the calculation:

$$n = (\frac{r+1}{r}) \frac{(\bar{p})(1-\bar{p})(Z_{\beta} + Z_{\alpha/2})^2}{(p_1 - p_2)^2}$$

n = sample size per arm

r = ratio of women who had intention of delaying their pregnancy: women who had no intention to delay their subsequent pregnancy by two or more years, 3:1 in this case.

P_1= proportion of mothers who utilize LARC and delay pregnancy by more than 2 years, in this case 24% (20)

P_2=proportion of mothers who utilize LARC and intend to get pregnant within 2 years after the current delivery, in this case 20%(20)

Ṕ =measure of variability, taken as 0.24 + 0.2 /2 = 0.22

Z_{β}=Value corresponding to the power of the study, in this case 80% = 0.84

$Z\alpha$ = Value corresponding to the normal standard deviate at 95% C.I in this case = 1.96, with 0.05 level of significance

P_1- P_2 = effect size (difference in proportions) = 0.24 – 0.20=0.04

Substituting these values in the equation gave us a sample size as calculated below:

Where n $= \frac{(3+1)}{1} \frac{(0.22)(0.78)(7.84)}{0.0016}$

= 1.33 * 840 = 1117

Therefore: sample for women who intent to get pregnant after 2 years = **1117** while those who intent to get pregnant in less than 2 years = 1117/3 = **372**

7.7.Patient recruitment procedure

Potential study participants were identified during triage at the maternity unit. The recruitment was done by the principal researcher and the research assistants who included nurses, clinical officers and medical officers working in the maternity unit during the period of the study.

A simple random sampling procedure using a random sample table was used to identify potential study participants among women who met the inclusion criteria. They received an invitation to participate in the study. Participants received a verbal explanation on the purpose of the study, the procedure, and the benefits and risks of the study.

The following steps were undertaken to arrive at the study participants;

Stage 1: A total of 3792 women were attended to deliver at the Thika Level Five Hospital maternity unit from the period of January 2019 to April 2019.

Stage 2: All of them were screened for eligibility using the inclusion and exclusion criteria during history taking and an explanation of the study done. They all received counselling on IPPLARC and those who consented to participate in the study were recruited.

During the study period (1,489 participants) were recruited for administration of the study questionnaire.

Stage 3: Based on the ratio of 1:3 (those who have no intention of delaying their pregnancy by two years or more: those who intent to delay their pregnancy by two years or more) on average, 14 participants in the exposed (women who intend to delay pregnancy by 2 or more years) and 5 participants in the unexposed group (women who intend to conceive

within 2 years), were sequentially selected on a daily basis during the study period till the calculated sample size of 1117 (exposed arm) and 372 (non-exposed arm) was arrived at.

Stage 4: Those who accepted to participate in the study had the questionnaire administered to them after signing the consent form; for those who opted out, a replacement was done by picking the next qualified patient as per the inclusion criteria.

7.7.1. Consenting

A written informed consent (appendix.1) was obtained from those who were eligible to give consent and willing to participate in the study. Participants aged 15-18yrs who were willing to participate in the study were allowed to consent as emancipated minors.

7.7.2. Counseling on contraceptive methods

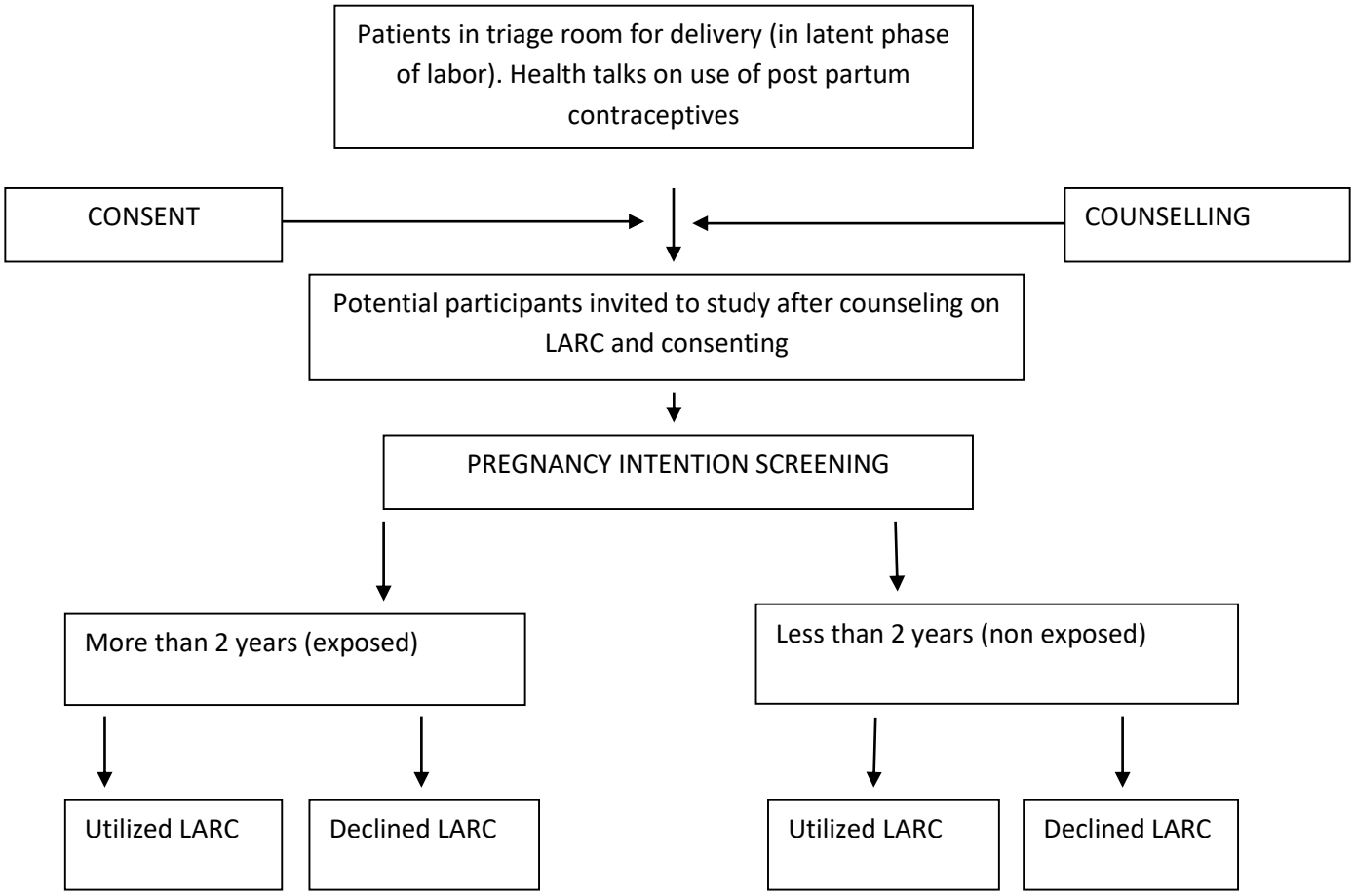
Counseling was offered by the principal researcher or the research assistant on all methods of family planning available in the immediate postpartum period. This was done through; creation of rapport, discussing the reproductive goals of the mother/couple (birth spacing, timing and individual or couples choice on number of children desired); introducing the type of post-partum contraceptives and communicating the potential benefits and complications of each method, addressing participants concerns and offering reassurance and confirming the type of contraceptive chosen. The study participants were subjected to the first part of a pretested questionnaire (appendix 2) and allowed to progress through labor to delivery, either through C/S or SVD, adhering to the hospital protocol of labor and delivery.

Those who gave informed consent for immediate postpartum LARC and meet the medical eligibility criteria, an affirmation that she still desired the method of immediate postpartum contraception was made by the attending midwife.

Preparation was made to administer the contraceptives under study to those who opted for them. Those who opted for an alternative method of post-partum contraception were advised appropriately on how to receive the contraception. The contraceptive was administered within 10 minutes of post placental extraction or within 48hrs after delivery.

The procedure checklist for immediate postpartum LARC was used to standardize insertions following SVD or after elective c/s (appendix 3&4) and those who declined immediate postpartum LARC options were offered other family planning method of choice. All women under the study received standard post-partum care as per the hospital protocol of care.

Figure 2: Recruitment of participants



7.8. DATA COLLECTION

Data collection was done through a face to face interview using a pre tested questionnaire (appendix. 2) during the recruitment and insertion. The questionnaire was administered by the principal investigator or the research assistant after recruitment. The questionnaire had two sections. The first section of the questionnaire was filled after recruitment into the study and the second part was filled after insertion of the LARC prior to discharge but within 48 hours after delivery.

7.9. DATA QUALITY ASSUARANCE

Standard operating procedures were implemented during the insertion of the LARC as described in appendix 3. Pre coded questionnaires were used to collect the data. The questionnaires were pre- tested and analyzed before a final draft was administered to the study

participants. The research assistants were trained on confidentiality, interviewing, information retrieval and filling the questionnaire.

The principal investigator ensured that regular monitoring and supervision of the research assistants was done during data collection period. This included checking of each filled questionnaire for completeness. Ten percent of the completed questionnaires were manually checked against the primary data source to ensure data accuracy during the study period.

The follow up study procedures included the following:

- At the beginning of the study, the principal researcher ensured availability of all the requirements; LARC, contraceptive implants (Jadelle), and printed documents required for the study.

- Biweekly meetings were held by the principal researcher and the research assistants to review the progress, including; monitoring of recruitment, reviewing challenges faced, ensuring that daily supplies of necessary documents and LARC were available.

- The LARC contraceptives were availed in bulk and stored safely in the hospital pharmacy department. Weekly supplies were obtained and stored in the maternity unit and records were kept on the utility usage.

- A weekly feedback checklist was obtained from some of the women who participated reviewing their opinion about the study.

The participants were recorded by a serial number matched on the file. The list was kept confidential accessible by the researchers only.

Filled questionnaires were kept in a secure lockable cabinet only accessible by the principal investigator and research assistants.

7.10. Data analysis

The study included two groups of women; those who intended to get pregnant after a period of 2 years or more from the current pregnancy and those who wanted to conceive before two years after they deliver. Data was collected from the two groups and uploaded in STATA (statistics and data) software version 15 for cleaning and coding then analysed. An 80% power and a two-sided p value of 0.05 was taken as statistically significant.

The primary outcome was uptake of IPPLARC. The secondary outcomes included socio-demographic factors, knowledge about IPPLARC and reproductive characteristics (family size, number of previous pregnancy losses, age at menarche and age at first sexual debut).

Descriptive data was presented using means and standard deviations around the mean for numerical variables such as participants' age, number of children and number of pregnancy loss. Data on categorical variables such as religion, marital status, educational status and occupation were presented in a table as proportions.

Bivariate analysis to establish the association of individual factors including age, religion, marital status and knowledge on use of LARC was done using chi square test.

Linear and logistic regression model was applied to variables that were statistically significant to determine association of desired pregnancy spacing, education status, number of children and number of pregnancy loss and the uptake of LARC services in the two groups.

8. ETHICAL CONSIDERATIONS

Ethical approval was granted by The Kenyatta National Hospital (KNH) and The University of Nairobi Ethics and Research Committee, and the national commission for science, technology and innovation.

Permission to conduct the research was granted by department of obstetrics and gynecology at The University of Nairobi, and TLFH ethics committee.

The purpose of the study was carefully explained to the caregivers and any questions raised were addressed prior to obtaining written informed consent.

Confidentiality was observed throughout the study period; the study participants were given study identification numbers and no personal identification number was recorded.

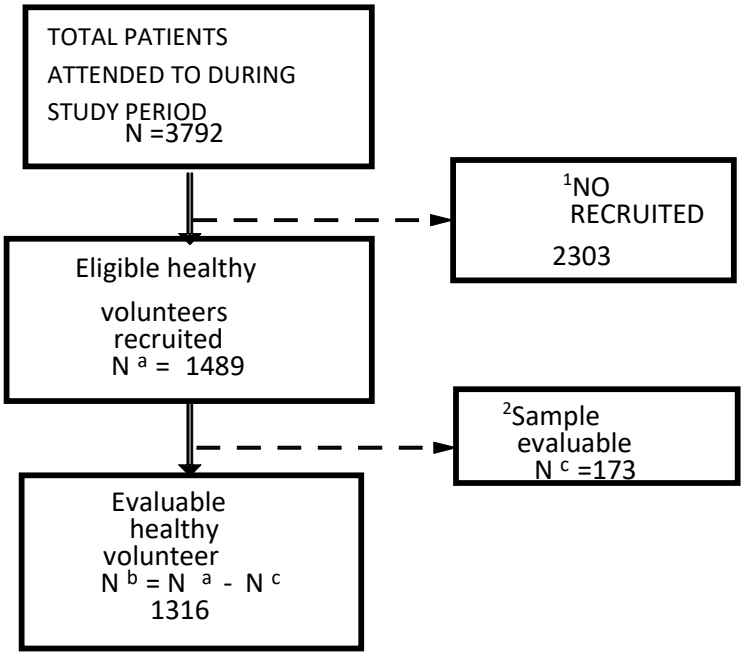
The Kenya Obstetrical and Gynecological Society of Kenya offered all the logistics support required to carry out this study including training of the staff service provision, PPIUD, and materials for counselling.

9. RESULTS

9.1. Description of the study population

During the study period of December 2018 to May 2019, a total of 1489 women who met the inclusion criteria were enrolled in the study after giving informed consent. However, a total of 173 participants were excluded from the analysis due inadequate information. One thousand three hundred and sixteen were included in the analysis.

Figure 1. Cohort flow diagram



[1] Excluded by the simple random sampling procedure using the simple random sample frame that was used to identify potential study participants.

[2] excluded from the analysis due to inadequate information in the questionnaires.

9.2. Socio-demographic characteristics of the study participants

The socio-demographic characteristics of the participants is as shown in Table 1. The mean age (±SD) of the participants was 26.14 (±5.87). As shown in Table 1 below, a majority 447 (34%) of the participants were found in the age group of 20 to 24 years; adolescents and young adults (up to 24years) formed 45% of the participants. Out of the respondents, 1092 (83%) were married. Most (74%) were Catholics by religion. About the education level, 1305 (99.8%) had achieved primary level of education while a majority, 942 (73%) were unemployed. About 948 (68.3%) reported to be staying with their partner.

Table 2. Socio-demographic characteristics of the study participants

Variable	Frequency	Percentage
Age (N=1309)	**(n)**	**(%)**
less than 19	147	11
20-24	447	34
25-29	353	27
30-34	229	18
above 35	133	10
Religion (N= 1282)		
Christian non-Catholics	309	24
Christian Catholics	950	74
Muslims	7	0.5
None	16	1.5
Marital status (N=1316)		
Single	224	17
Married	1092	83
Education level (N=1308)		
None	3	0.2
Primary	378	28.9
Secondary	723	55.3
College/University	204	15.6
Employment status (N=1288)		
Unemployed	942	73
Business	142	11
Salaried	204	16
Person staying with (n=1178)		
Alone	81	5.8
Guardian	17	1.2
Parents	132	9.5
Partner	948	68.3

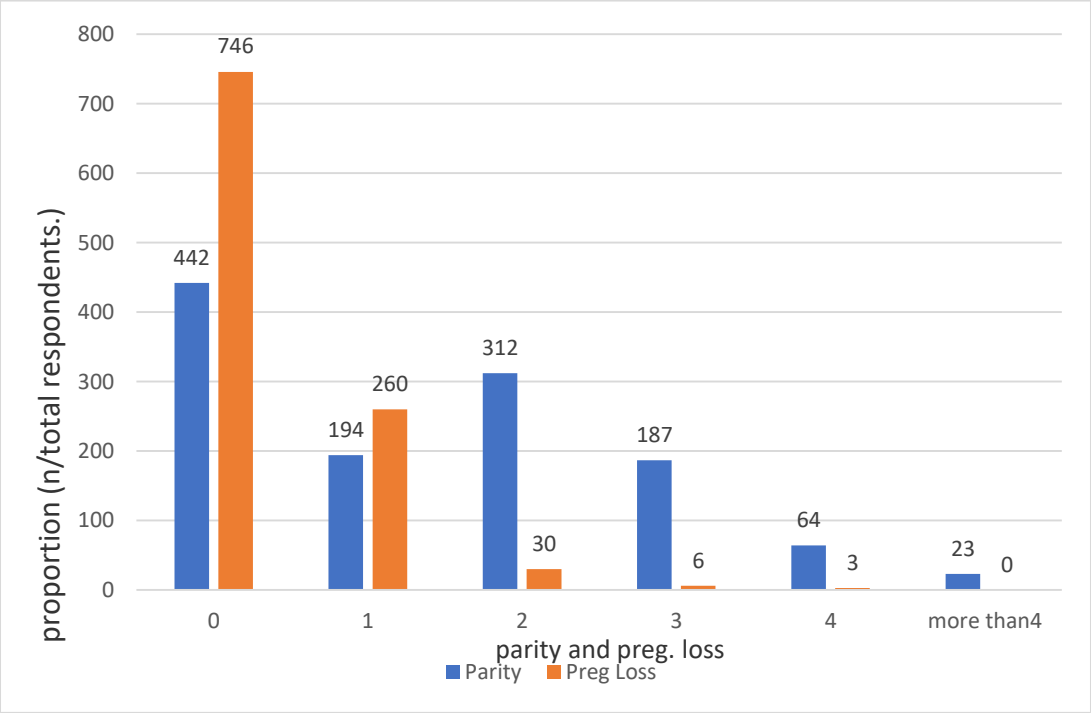
9.3.Reproductive characteristics

The mean age at menarche was 13.72years (SD. 1.4) while the mean age at first sexual debut was 17.7 years (SD 2.3). The average family size was 2 children (311, 22.4%). On average, most women had never experienced a pregnancy loss (mode of 0, 746). Most participants were primigravidae. The reproductive characteristics are summarised in figure 3 and table 3.

Table 2. Mean age at menarche and first sexual debut

	Age at menarche	Age at sexual debut
Mean	13.72	17.73
Std. Deviation	1.403	2.339
Minimum	9	12
Maximum	20	32

Figure 2 Average proportion of parity and number of pregnancies lost.



9.4.Association between exposure variables and uptake of IPPLARC

Women who intent to delay their subsequent pregnancy by 2 years or more have higher odds of use LARC methods compared to those who intend to get pregnant in less than 2 years after delivery, (OR=2.89, 95% CI 1.89 – 4.33, p = <0.0001).

Among the secondary variables assessed; women who had 3 or more children (OR 2.45, 95% C.I 1.53-3.92, p 0.0001), no previous pregnancy loss (OR 2.05, 95% C.I 1.38-3.05, P0.05), prior knowledge about IPPLARC (OR 1.93, 95% CI:1.40-2.67, p 0.0001), and those who were employed (OR 1.37, 95% CI 1.01-1.85 p<0.045) had higher odds of utilizing IPPLARC. These findings were statistically significant (p value <0.05). The other socio-demographic and reproductive characteristics; age, marital status, education level, age at sexual debut and residing with or without sexual partner, had no significant association with the utilization of IPPLARC. This is shown in Table 3.

Table 3. Association between intention to delay pregnancy, prior knowledge about IPPLARC, reproductive and socio-demographic characteristics and uptake of IPPLARC

	LARC use		**Odds Ratio**	**P value**
Variable	**Yes N (%)**	**No**	**(95% CI)**	
Intended inter pregnancy interval				
≥2 years	221 (88.8)	787 (73.4)	2.86	**<0.0001**
< 2 years	22 (11.2)	285 (26.6)	(1.89-4.33)	
Age (years) (n=1309)				
Less than 25 years	129(52.4)	586 (55.1)	0.897	0.445
More than 25 years	117(47.6)	477 (44.9)	(0.68-1.19)	
Religion (n= 1282)				
Christian Catholics	155 (69.5)	795(75.1)	0.76	0.09
Non-Catholics	68 (30.5)	264(24.9)	(0.55-1.04)	
Marital status (n=1316)				
Single	35(14.2)	189(17.7)	0.77	0.196
Married	211(85.8)	881(82.3)	(0.52-1.14)	
Education level (n=1308)				
Above Primary	166(68.9)	761(71.3)	0.89	0.45
Primary	75(31.1)	306(28.7)	(0.65-1.20)	
Employment status				
Employed	76(32.1)	270(25.7)	1.37	**0.045**
Unemployed	161(67.9)	781(74.3)	(1.01-1.85)	
Person staying with (n=1178)				
Without partner (sexual)	50(21.9)	190(19.8)	0.911	0.628
With partner	178(78.1)	770(80.2)	(0.62-1.33)	
Age at sexual debut				
≥19 years	56 (24)	226 (31)	1.16	0.375
<19 years	177 (76)	831 (69)	(0.83-1.63)	
Family size				
≥3 children	30 (13)	55 (05)	**2.45**	**<0.0001**
< 3 children	206(87)	980(95)	(1.53-3.92)	
Previous pregnancy loss				
No pregnancy loss	156(82)	591(69)	**2.05**	**<0.0001**
≥1 pregnancy loss	34(18)	264(31)	(1.38-3.05)	
Previous IPPIUD knowledge				
Had previous knowledge	194 (77.9)	693 (64.6)	**1.93**	**<0.0001**
No previous knowledge	55 (22.1)	379 (34.4)	(1.40-2.67)	

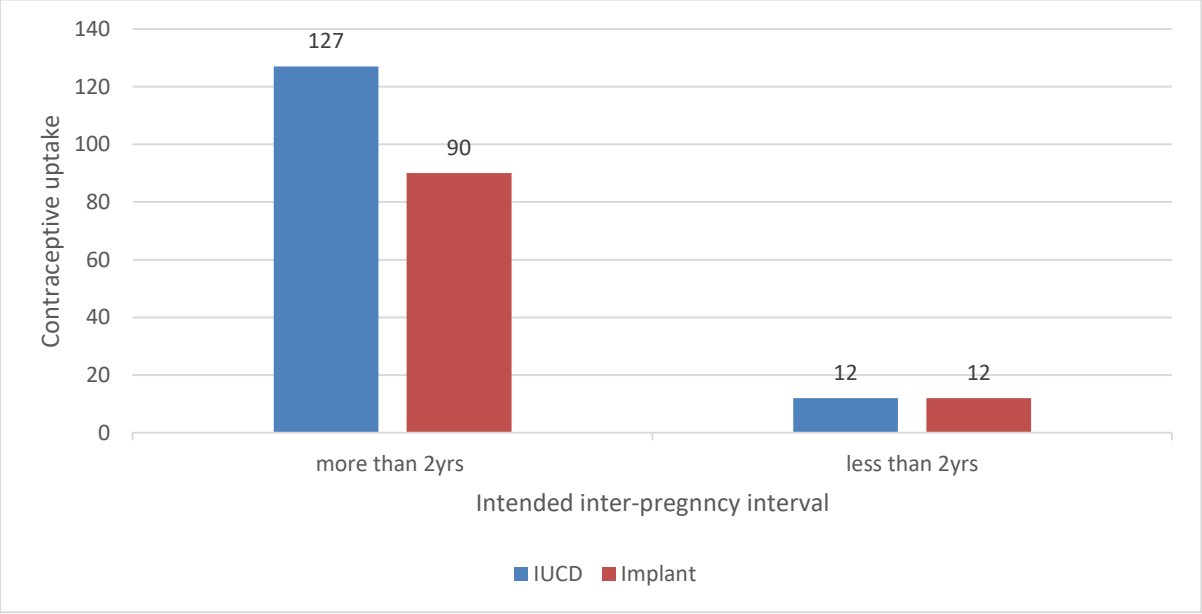
9.5. Uptake of immediate postpartum contraceptives among women who intend to delay their subsequent pregnancy by two years or more and those who intend to conceive before two years after delivery.

The rate of uptake of IPPLARC among women delivering at Thika Level Five hospital during the study period was 18.31%. The rate of uptake of intrauterine devices was higher than that of contraceptive implants. {IUCD 139(57.6% and implants 102(42.32%).

Among the women intending to delay their subsequent pregnancy by two years or more, the utilization of intrauterine contraceptive device was higher 127 (58.5%) than contraceptive implant. 90 (41.5%)

Women who intended to conceive within two years after delivery did not demonstrate a preference for one form of contraceptive over the other. This is demonstrated in figure 3.

Figure 3 uptake of immediate postpartum long acting reversible contraceptives among women who intend to delay their subsequent pregnancy by two years or more and women who intend to conceive in less than 2 years



Women who had more knowledge about contraceptives that can be utilized immediately in the post-partum period were also found to have higher odds of intending to delay their subsequent pregnancy by two years or more. This is shown in table 5.

Table 3 Association of post-partum contraceptive knowledge and intention to delay subsequent pregnancy

		Intention to delay pregnancy by more than 2 years		Odds ratio	P value
		Yes	No (%)	(95% C I)	
Knowledge on LARC (n=1321)	Yes	701(79.0)	307 (70.7)	1.56 (1.12 – 2.03)	0.001
	No	186 (21.0)	127 (29.3)		

6. Logistic regression (controlling for possible confounders)

After controlling for the potential confounders in the relationship through multivariate analysis, women who intended to delay their pregnancy by 2 or more years had a higher adjusted odds ratio (aOR 3.89, 95% CI 2.20-6.89, P <0.0001) of taking up IPPLARC. The adjusted odds of utilizing IPPLARC among women with 3 or more children and those who had prior knowledge about IPPLARC remained significantly high as shown in table 6.

Table 4. Logistic regression for statistically significant variables associated with uptake of IPPLARC.

Variable		Crude Odds Ratio (CI 95%)	Adjusted Odds ratio (CI 95%)	P value
Intention to get pregnant	More than 2 years Less than two years	2.8 (1.89-4.33) *	3.89 (2.20-6.89) *	<0.0001
Employment status	Employed Not employed	1.37 (1.01-1.85) *	1.21 (0.84-1.75)	0.20
Number of children	More than 3 children Less than 3 children	2.45 (1.53-3.92) *	2.23 (1.30-3.82) *	0.006
Number of Pregnancy losses	No pregnancy loss More than one pregnancy loss	2.05 (1.38-3.05) *	1.13 (0.73-1.76)	0.86
Knowledge on Use of PPIUD	Yes No	1.93 (1.40-2.67)	1.91* (1.29-2.83)	0.001

N/B: *p = <0.05

10. DISCUSSION

Women who intend to delay their subsequent pregnancy by two years or more have about 4 times the odds of taking up immediate post-partum long acting reversible contraceptives than their counterparts who reported that they would conceive within the subsequent two years after delivery. The differential outcomes between the two groups in this study can be explained by the increased awareness about the efficacy of long acting reversible contraceptives in achieving an optimum inter-pregnancy interval. This awareness can be attributed to the PPIUD initiative program that has seen women engaged at the community level, and during their pregnancy period through advocacy and counselling on the benefits of intrauterine contraceptives.

The findings are consistent with the findings by Tefera et al in Ethiopia which showed the odds of PPIUD utilization were increased by 2.36 times among mothers who did not have a plan to have another child.[23] The findings from these studies demonstrate that future fertility intention has a strong correlation to long acting contraceptive uptake in the immediate postpartum period. The studies in Ethiopia, however, assessed the intention to utilize contraceptives in the extended postpartum period and therefore limits their comparison to this study which focused on utilization during the 24 hours after delivery. They however shared the similarity of having been carried out in health facilities that have institutionalized post-partum family planning program.

One limitation of this study is that it was carried out in a center that has institutionalized immediate postpartum family planning making it available and cost effective, with increased dissemination of information about contraception in the immediate postpartum period during antenatal care. Being a unique program that is not available in many other facilities, the findings therefore, cannot be generalized to all women in the postpartum period in the country. The study however involved a large study population thus making it more powerful and reducing selection bias and sample bias.

Advocacy on optimum inter-pregnancy interval as recommended by World Health Organization, [1] when leveraged to antenatal and post-partum care, can evidently increase the immediate postpartum contraceptive uptake. The bi-directional relationship between intended inter-pregnancy interval and uptake of immediate postpartum long acting methods of contraception provides an avenue that can be exploited to increase contraceptive uptake. Further studies should be carried out on women's intention to delay subsequent pregnancy as a factor influencing contraceptive use with an aim of increasing contraceptive uptake.

The study also demonstrated that the proportion of women taking up IPPLARC among those with intention to delay pregnancy by 2 years or more was higher (21.9%) than those utilizing

but intending to conceive before 2 years (8.9%). Most women showed preference for the intrauterine contraceptive device (59%) than the implant (41%) with a glaring difference among those women who intend to delay their pregnancy by two or more years. This could also be attributed to the strong advocacy program instituted that has focused on postpartum intrauterine contraceptive device provision that is available and affordable. Could this differential finding on contraceptive choice be explained by a significant difference in contraceptive needs between the two groups and emphasize the intention to delay subsequent pregnancy as a strong determinant of contraceptive uptake in the immediate postpartum period? It could as well be.

This finding of higher preference for the intrauterine contraceptive device contradicts the findings in KDHS 2014(5) which shows that most women in Kenya have the contraceptive implant (7.1%) compared to the intrauterine contraceptive device (2.3%). However, the findings in the KDHS are obtained from a survey of all women of reproductive age group, thus comparing their family planning choices to those in the immediate postpartum period can be misleading since they have different family planning needs. This difference in choice of contraceptive is therefore not surprising. Another study done in the urban slums of Nairobi (24)showed that LARC methods were the least popular in the postpartum period with only 4% opting for the implant and even fewer women opted for IUCD. Both the national survey and the study done in Nairobi slums by Mumah et al [(24)]demonstrate a preference for the contraceptive implant as opposed to the intrauterine contraceptive device, a difference that may be attributed to the unique family planning needs of women in the immediate postpartum period who intend to delay their subsequent pregnancy by two or more years, a need that has previously not been addressed.

Previous studies carried out on uptake of IPPLARC demonstrated that there was a difference in the intention to utilize IPPLARC and the actual utilization[(20)]. By providing the contraceptives and determining the actual utilization as opposed to evaluating association using the intent to utilize contraceptive methods, this study reduced the threats to conclusion validity and construct validity such as unreliable measures, and violated assumption test. This raises the statistical reliability of the findings.

There is paucity of data on pattern of contraceptive uptake in the immediate postpartum period. More studies should be done to investigate the contraceptive needs specifically of women in the immediate postpartum period.

The overall rate of uptake of IPPLARC during the study period was 18%. Cost efficiency and ease of administration of PPIUD in the post-partum period may explain the increased

acceptance of IPPLARC. The high uptake of IPPLARC can be attributed to the ongoing PPIUD initiative program overseen by FIGO/KOGS which aims at institutionalizing PPIUD services across several hospitals in six countries, including TL5H in Kenya.[25] The program has overseen training of health service providers on post-partum intrauterine devices service provision thus increasing acceptance and skills of service providers thereby overcoming some of the major barriers of IPPLARC provision majorly; untimely counselling and insufficient provision of information.

Although there is paucity of data on uptake of IPPLARC in Kenya, the uptake is higher than the overall number of women in Kenya taking up long acting reversible contraceptive methods, as reported by the KDHS at 7.9% [4]. The initiative which involves advocacy at the community level on IPPLARC, health workers' training, and cost-effective provision of immediate postpartum contraceptives has contributed to an increased uptake of postpartum contraceptives among women delivering in these facilities. [26]

A study done by Chako et al in Houston, looking at the adolescents' intention to utilize IPPLARC and showed that 23% were intending to utilize immediate postpartum long acting reversible contraceptives,[17] Tefera et al in Ethiopia did a similar study and found an acceptance rate of 21.6%.[23] Both studies showed a relatively high intention for utilization similar to our findings. When compared to the two previous studies, the institutionalization of immediate postpartum family planning seems to be a common denominator in all settings where the uptake is high.

Margo et al however did a literature review on use of IPPLARC in low- and middle-income countries and found that IPPLARC utilization among postpartum women was relatively low, with less than 15% taking it up as a method of contraception.[26] The difference in contraceptive utilization across different hospital settings among women in the postpartum period also emphasizes the need for future research in contraceptive uptake among this special group of women.

One limitation of this study is that it was pegged on an active program aimed at institutionalizing postpartum intrauterine contraceptive devices. This may have been a source of bias with an exaggerated uptake of contraceptives in the immediate postpartum period. It however had the advantage of highlighting the positive impact of institutionalization of postpartum family planning program. Another strength of the study is that it's a relatively high level of evidence being a high clinical value study, by virtue of being a prospective cohort study.

A positive finding from this study was that women who were more informed about IPPLARC were more likely to opt for an interpregnancy interval of two years or more. {p=0.001 OR=1.56 CI=1.12-2.04}.

Although there is limited data on association of knowledge about immediate postpartum long acting reversible contraceptives and intention to delay subsequent pregnancy, this new finding emphasizes the bi-directional positive relationship between optimum inter-pregnancy interval and long acting reversible contraceptives.

When multivariate analysis was applied for the statistically significant variables (intention to get pregnant, employment status, number of children, number of previous pregnancy losses and knowledge about IPPLARC), the odds of taking up IPPLARC among women who intended to delay their subsequent pregnancy had even a higher likelihood of utilizing IPPLARC. Women who had three children or more and those who had prior knowledge about IPPLARC still had high odds of utilizing immediate postpartum long acting reversible contraceptive during the immediate postpartum period.

11. CONCLUSION

The following conclusion were drawn following data analysis;

- The intention for an optimum inter-pregnancy interval of 2 years or more increases the odds of utilizing immediate postpartum long acting reversible contraceptives by up to 4 times
- The utilization of immediate post-partum long acting reversible contraceptives is higher among women who intend to have a long inter-pregnancy interval of two years or more.
- Knowledge about immediate postpartum long acting reversible contraceptive increases the odds of intending to utilize it in the immediate postpartum period.
- Knowledge about available contraceptive options in the immediate postpartum period increases utilization during this period.

12. RECOMMENDATION

Policy formulation to disseminate information and advocacy on the benefits of an optimum inter-pregnancy interval should be instituted at community and hospital level as a crucial intervention in increasing uptake of immediate post-partum long acting reversible contraceptive.

Institutionalizing provision of immediate post-partum long acting reversible contraceptives should be prioritized as an intervention to increase contraceptive uptake and accelerate bridging the gap on unmet need for family planning during the post-partum period.

More studies should be done on the relationship between optimum interpregnancy interval and utilization of immediate postpartum contraceptives with an aim of exploiting the bi-directional relationship to increase family planning uptake.

13.STUDY LIMITATIONS

1. The study was conducted in an urban setting, the findings may therefore not be generalizable to the whole country.
2. The PPIUD initiative has been actively undertaken in the facility for over 5 years, this has seen a great impact in terms of contraceptive uptake in the postpartum period, other parts of the country that don't have a similar program running cannot be compared to the population in this facility.
3. The study relied on willingness of the participants to provide accurate information about intimate decisions they make in their lives. This may have potentially affected the outcome.

14.REFERENCES

1. WHO. Programming Strategies for Postpartum Family Planning. WHO Libr Cat Data Program. 2013

2. Immediate Postpartum Long-Acting Reversible Contraception Committee on Obstetric Practice.

3. Geneva. Report of a WHO Technical Consultation on Birth Spacing Department of Making Pregnancy Safer (MPS). 2018 Jul 16

4. Ross A John, Winfrey L Winfrey. contraceptive use, intention to use and unmet need during the extended postpartum period. Int Fam Plan Perspect. 2001;27(1):20–7.

5. Kenya 2014 Demographic and Health Survey. 2014

6. National Family Planning Guidelines for Service Providers National Family Planning Guidelines for Service Providers National Family Planning Guidelines for Service Providers. 2010

7. Harrison MS, Goldenberg RL. Immediate postpartum use of long-acting reversible contraceptives in low-and middle-income countries. 2018 Jan 27

8. Muthamia M, Owino K, Nyachae P, Kilonzo M, Kamau M, Otai J, et al. The Tupange Project in Kenya: A Multifaceted Approach to Increasing Use of Long-Acting Reversible Contraceptives.

9. Comparing contraceptive efficacy [Internet]. [cited 2018 Aug 17]. Available from: https://www.gp-update.co.uk/files/docs/Comparing_contraceptive_efficacy.pdf

10. FAMILY PLANNING A GLOBAL HANDBOOK FOR PROVIDERS 2018 EDITION NEW 2018 [Internet]. [cited 2018 Aug 17]. Available from: http://fphandbook.org/sites/default/files/global-handbook-2018-full-web_0.pdf

11. Trussell J. Contraceptive Efficacy. Glob Libr Women's Med [Internet]. 2009; 374

12. Baldwin MK, Edelman AB. The Effect of Long-Acting Reversible Contraception on Rapid Repeat Pregnancy in Adolescents: A Review. J Adolesc Heal. 2013;52:S47–53.

13. World Health Organization. Medical eligibility criteria for contraceptive use Fifth edition 2015 Executive summary. 2015:1–14.

14. Rodriguez MI, Evans M, Espey E. Advocating for immediate postpartum LARC: increasing access, improving outcomes, and decreasing cost. Contraception. 2014;90:468–71.

15. Long-Acting Reversible Contraception: Implants and Intrauterine Devices ACOG PRACTICE BULLET IN Clinical Management Guidelines for Obstetrician–Gynecologists. Replace Pract Bull Number. 2017;130(121).

16. Joshi R, Khadilkar S, Patel M. Global trends in use of long-acting reversible and permanent methods of contraception: Seeking a balance. Int J Gynecol Obstet 2015;131:S60–3.

17. Thiel De Bocanegra H, Chang R, Howell M, Darney P. Interpregnancy intervals: impact of postpartum contraceptive effectiveness and coverage. Am J Obstet Gynecol. 2014

18. Chacko MR, Wiemann CM, Buzi RS, Kozinetz CA, Peskin M, Smith PB. Choice of Postpartum Contraception: Factors Predisposing Pregnant Adolescents to Choose Less Effective Methods Over Long-Acting Reversible Contraception. J Adolesc Heal 2016;58:628–35.

19. Finer LB, Zolna MR. Unintended pregnancy in the United States: incidence and disparities, 2006. Contraception [Internet]. 2011 Nov 1 [cited 2018 Aug 21];84(5):478–85. Available from: https://www.sciencedirect.com/science/article/pii/S0010782411004720

20. Tefera LB, Abera M, Fikru C, Tesfaye DJ. Utilization of Immediate Post-Partum Intra Uterine Contraceptive Device and Associated Factors: A Facility based Cross Sectional Study among Mothers Delivered at Public Health Facilities of Sidama Zone, South Ethiopia. [2018 Feb 1];

21. Shabiby MM, Karanja JG, Odawa F, Kosgei R, Kibore MW, Kiarie JN, et al. Factors influencing uptake of contraceptive implants in the immediate postpartum period among HIV infected and uninfected women at two Kenyan District Hospitals. BMC Womens Health 2012;15.

22. Hanna YE, Argaw EG. Determinants of Long Acting Reversible Contra-ception Method Use among Mothers in Extended Postpartum Period, Durame Town, Southern Ethiopia: A Cross Sectional Community Based Survey. Health (Irvine Calif) . 2014

23. Gebremichael H, Haile F, Dessie A, Birhane A, Alemayehu M, Yebyo H. Acceptance of Long Acting Contraceptive Methods and Associated Factors among Women in Mekelle City, Northern Ethiopia. Sci J Public Heal. 2014 Jul 26;2(4):349.

24. Mumah JN, Machiyama K, Mutua M, Kabiru CW, Cleland J. Contraceptive Adoption, Discontinuation, and Switching among Postpartum Women in Nairobi's Urban Slums. Stud

Fam Plann. 2015 Dec;46(4):369–86.

25. Makins A, Arulkumaran S. Institutionalization of postpartum intrauterine devices. Int J Gynecol Obstet. 2018;143:1–3.

26. Harrison MS, Goldenberg RL. Immediate postpartum use of long-acting reversible contraceptives in low-and middle-income countries. [2018]

15.APPENDICES

15.1. APPENDIX 1: CONSENT FORM

THE UNIVERSITY OF NAIROBI

COLLEGE OF HEALTH SCIENCES

Department of obstetrics and gynecology

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

This informed consent is for women attending the maternity/labor ward at Thika level five Hospital who we are inviting to participate in a clinical study on family planning methods which are provided immediately after delivery. The title of my research project is '*Association of intended birth to pregnancy interval and uptake of immediate post-partum long acting reversible contraceptives at Thika level five hospital'*

Principal investigator; Dr. Bruce Otieno Semo,

University of Nairobi

College of health sciences

Department of obstetrics and gynecology

Telephone no: 0717059419

PART 1

INFORMATION SHEET

I am a student at the University of Nairobi pursuing a master's degree in obstetrics and gynecology. We are carrying out a study to understand how women use family planning methods immediately after giving birth.

While going through this, there may be some words used that you don't understand, please feel free to stop and ask me or any health worker involved in the study.

Purpose of the study

There are several methods of family planning available in the government hospitals. A lot of women report that they want to prevent another pregnancy for one year after giving birth but very few women are using family planning immediately after birth. These methods, namely *the coil* and *implant,* are reliable in preventing pregnancy and because the woman will receive them immediately after birth, they save the mother the trouble of having to return to hospital to get a family planning method. The two methods have also been approved by ministry of health and available in several government hospitals.

The purpose of this study is to find out whether women who want to delay getting pregnant again in the near future (for 2 years or more) are more likely to use *the coil* and *implant* as contraceptives if offered immediately after giving birth, and to learn what they know about family planning methods that are available after giving birth.

The research intervention

The research will involve a talk about family planning methods available in the hospital, and answering a set of questions about family planning and future plans for getting another baby. After delivery, the family planning methods under study (the coil and implant) will be offered and inserted to those who desire. These methods can be used immediately after giving birth. They are also safe and efficient in preventing pregnancy and can be removed whenever a woman desires to get pregnant again. They do not affect your chances of getting pregnant once removed.

Participant selection and voluntary participation

All women who have come for delivery are invited to participate in the study.

It is your choice whether to participate or not. Whether you choose to participate or not, you will still receive the treatment that is routinely offered in this hospital, and we will tell you more about family planning methods later. You may also change your mind later and stop participating even if you had agreed earlier to participate.

Duration of the study

The study will last from the time you are admitted for labor and end when you are discharged from the hospital or at any time if you change your mind about participating.

Description of the process

During the study, you will be approached by the healthcare worker participating in the study while you are still in the early stages of labor. You don't have to agree to a method of family planning to be allowed to participate in the study.

The health worker will review your medical records and invite you to participate in the study after explaining the purpose of the study, the benefits and risks. Upon agreeing to participate, you will be expected to sign a form indicating that you have allowed us to include you in the study. The study will then proceed as follows.

A health worker will talk to you about long acting methods of family planning which can be used immediately after giving birth.

The health worker will ask you a set of questions about yourself, family planning, and whether you are interested in receiving a family planning method after giving birth.

You will receive the routine care during labor and delivery as provided in the hospital.

If you are not interested in any family planning method, your participation will end at this point.

After delivery, the attending health worker will confirm if you are still interested in receiving the method of family planning (for those who were interested) and it will be administered upon confirmation by a skilled and trained attendant.

There are two methods being offered during the study known as long acting reversible contraceptives/family planning methods. (This means they are effective for a long period without need to take pills or seeing a doctor, their effect can be stopped by removal of the contraceptive and one can conceive again):

- THE CONTRACEPTIVE ‘COIL’ (intra uterine device)

This is a method of contraception that is approved by the ministry of health for use immediately after delivery. It consists of a plastic device with an amount of copper that is inserted in the womb after delivery and retained for the duration desired for family planning. It is active for a period of 10 years and is 99% effective. This means that it is very effective in preventing pregnancy but on some rare occasion, some women conceive while still using it. It prevents pregnancy by preventing the fertilized egg from attaching on the womb. It also prevents the sperm from reaching the egg.

The insertion of the coil can be done immediately after delivery or any other time provided a woman expresses desire and is not pregnant.

- THE IMPLANT.

This is made of 2 plastic devices that contain some hormone. The device is inserted in the inner part of the arm through a small cut made after medication has been given to the area to minimize the pain. The two rods release the hormone into the blood which acts to prevent a pregnancy from occurring. It can also be administered to women immediately after giving birth and does not harm the baby or affect breastfeeding. It is also 99% effective.

If you prefer an alternative method that is not given after delivery, you will be advised on how and when to receive it. Please feel free to ask the health worker any questions you have about any other methods available.

Reimbursements

There will be no payments made to those who participate in the study, however, those who receive the family planning methods immediately after birth will not be charged for the procedure or the family planning device.

Confidentiality

The information collected from this study will be kept in secrecy. Information about you that will be collected during the research will be put away and no-one but the researchers will be able to see it. There will be no recording of your name on any of the study/research papers. A number will be assigned to your information and only the researchers will know that number. It will not be shared with or given to anyone except the research team.

PART 2: CERTIFICATE OF CONSENT

I have read the section on information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I agree to be a participant this research.

Name of Participant_____

Signature _____

Date _____

If illiterate

I have witnessed accurately, the reading of the consent form to the potential participant. The individual has had the opportunity to ask questions. I confirm that the individual has agreed to participate freely without coercion.

Print name of witness_____ AND Thumb print of participant

Signature of witness _____

Date _____

Researcher/ research assistant

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of Researcher/person taking the consent_____

Signature_____

Date _____

15.2. APPENDIX 2: QUESTIONAIRE

- **Topic:** ASSOCIATION BETWEEN BIRTH INTERVAL AND UPTAKE OF IMMEDIATE POSTPARTUM LONG ACTING REVERSIBLE CONTRACEPTIVE AMONG WOMEN AT THIKA LEVEL FIVE HOSPITAL
- Interviewers name.....
- Study.no.....
- Date of interview.....
- **Section A:** Socio-demographic data
- **Age**.....

Marital status:

- Married ☐ Single ☐
- Other ☐
- **Highest formal education attained:**
- None ☐
- Pre primary ☐
- Secondary school ☐
- College ☐
- Lives with:
- Guardian ☐
- Partner ☐
- Parents' home ☐
- Alone ☐
- **Employment:**
- Employed ☐
- Unemployed ☐
- House wife ☐

- **Religion.....**
- **Section B: Obstetrics and gynecology history**
- Menarche (years).....
- Age at first sexual debut.....
- Number of living children.....
- Number of pregnancy losses.....
- Date of last delivery.....
- Do you intent to delay your next pregnancy by more than 2 years after the current delivery?

  Yes ☐ No ☐

Section C: LARC Knowledge use

- Do you know any methods of birth control that prevent pregnancy for a long time, and their effect can be reversed upon removal?
- Yes ☐ No ☐

- Have you ever used :
- Implants ☐
- IUCD (copper T) ☐
- Hormone releasing IUDS ☐
- If yes, for how long did you use it? .....
- What was the reason for discontinuation? .....

Section D: knowledge of immediate postpartum LARC

- Do you know that there are contraceptives that can be inserted immediately after delivery?
- Yes ☐ No ☐
- Mention any method of family planning that can be inserted immediately after delivery.
- Implant ☐
- IUD (Copper T) ☐
- IUD (hormone releasing IUD) ☐
- Not aware ☐
- How did you learn about the above methods of birth control?
- From the antenatal clinic visits ☐
- From friends/relatives ☐
- From radio/TV/social media ☐
- From other visits to hospital (other than ANC) ☐
- Other (specify) ☐

Section E: Use of post-partum LARC

- Would you like to have a temporary method of family planning inserted immediately after delivery?
- Yes ☐ No ☐
- If answered no, why?
- .....
- Which type of immediate post-partum contraceptive would you like to have inserted?
- Contraceptive implant ☐ Copper T IUCD ☐
- Hormone releasing IUCD ☐
- *Those who opt for the hormone releasing IUD will be advised appropriately on how to receive it in the immediate post-partum period.*

- *Those who consented to utilization of LARC, proceed as below after delivery*
-
- I am going to proceed with the procedure for administration of the LARC as earlier agreed. Is that ok? Yes ☐ No ☐
- If no, would you like it inserted latter before you are discharged from hospital?
- Yes ☐ No ☐

Part 2: Post-partum LARC insertion procedure

- General examination
- Weight (kilograms).....
- Height (centimetres).....
- Temperature.....
- Pulse.....
- Blood pressure.....

MEDICAL ELIGIBILITY CRITERIA

The medical eligibility criteria (MEC) show whether a woman with certain medical condition is able to use the desired contraceptive method.

If clinical judgment is limited, category 1 and 2 both mean the method can be used and category 3 and 4 should not be used.

Medical condition	Copper IUD (category)	IMLANT Etonogestrel/levonogestrel Category)
Postpartum and breast feeding	1	2
Venous thromboembolism	1	1
Cardiovascular disease	1	2
Hypertension	1	2
Obesity	1	1
HIV STAGE 3 OR 4	3	1
LIVER tumor	1	3

THE EXCLUSION CRITERIA HAS EXCLUDED THOSE IN CATEGORY 3 AND 4

Category	Clinical recommendation
Category 1	Use method in any circumstance
Category 2	Generally, use method
Category 3	Use is not recommended unless other more appropriate methods are not available
Category 4	Do not use method.

IUCD insertion procedure

- *Abdominal exam*
- Uterus consistency

  Firm ☐ Soft ☐
- Previous caesarean section scar

  Yes ☐

  No ☐
- Fundal height.....

- Does the patient qualify for the intra uterine contraceptive device as per the medical illegibility criteria shown above?

  Yes ☐ No ☐
- The insertion is done:
- During a caesarean section ☐
- After SVD ☐

  Follow the guideline attached and proceed with the insertion of the IUCD.

Contraceptive implant insertion procedure

- What is the medical eligibility criteria category of the patient? (To be answered by the investigator).....
- *If the patient is category 1 or 2 for insertion, proceed as per the guidelines for insertion of contraceptive implant*

15.3. APPENDIX 3: CHECKLIST FOR IMMEDIATE POST PARTUM IUCD AND TWO-ROD CONTRACEPTIVE IMPLANT INSERTION

TASKS TO PERFORM PRIOR TO MANAGING ACTIVE LABOUR AND CONDUCTING VAGINAL DELIVERY	
1	Review the record and ensure that the woman has chosen immediate post-partum IUCD
2	Ensure that the woman was counseled and consented to insertion of immediate post-partum IUD
3	Explain that the IUD will be inserted immediately after labor and answer any questions that she may have.
TASKS TO PERFORM PRIOR TO INSERTION OF THE IUD	
4	Confirm availability of correct sterile instruments, PPIUD kit/tray, and light source, and availability of IUCD. Keep them sealed until immediately prior to insertion
5	Observe active management of labour and screen to ensure that there are no delivery related conditions that preclude the immediate post partum IUCD insertion
6	If any delivery related events that preclude her from receiving the contraceptive, explain to the patient and offer assessment for interval placement of the IUCD after 6 weeks. Offer an alternative method of contraceptive.
7	Ensure sterility by keeping the sterile gloves used for delivery on, if the IUD insertion is performed by the assistant different from the one who assisted the delivery, conduct AMTSL and perform hand hygene before putting on sterile gloves
8	NOTE: repair lacerations if need be after insertion of IUCD
INSERTION OF IMMEDIATE POST PARTUM INTRAUTERINE CONTRACEPTIVE DEVICE	
9	Confirm that the woman is still willing and ready to have the IUCD inserted. Answer any questions she may have and reassure her.
10	Have the PPIUD kit/tray opened and arrange the instruments in the sterile field and place a sterile drape on the woman’s abdomen
11	Gently insert the sims speculum to visualize the cervix by depressing the posterior wall of the vagina.

12	Clean the cervix and vagina two times with antiseptic solution twice with a clean swab for each time
13	Gently grasp the anterior lip of the cervix with a ring forceps and leave the forceps still attached to the cervix, withdraw the speculum at this time
14	Open the sterile package from the bottom by pulling back the plastic cover approximately one third of the way.
15	Hold the IUCD pack with the non dorminant hand stabilizing the IUCD in the package and remove the plunger, inserter tube and card from package
16	Use the dominant hand to grasp the IUCD using the placental forceps while still inside the package (carefull not to entangle the strings)
17	Gently lift the anterior lip of the cervix using the ring forceps
18	*Gently insert and slowly advance the IUCD (overlap this step with the next step)* • Avoid touching the wall of the vagina, insert the placental forceps (which holds the IUCD) through the cervix into the lower uterine cavity • Gently move the IUCD further into the uterine fundus till resistance is felt against back wall of the lower segment of the uterus • Keep placental forceps firmly closed, lower the ring forceps and gently remove them from the cervix and leave them on the sterile towel.
19	Elevate the uterus (this is maintained in the next 2 steps) • Place the base of the non dorminant hand on the lower part of the uterus (midline, just above the pubic bone with fingers toward the fundus) and gently push the uterus upward in the abdomen to extend lower uterine segment.
20	*Passing the IUD through the vagino uterine angle* • Keeping the forceps closed, gently move the IUCD upward toward the uterine fundus, in an angle towards the umbilicus. • Lower the dominant hand down to allow the ring forceps to pas through the vagino uterine angle and follow the the contour of the uterine cavity. Take care not to perforate the uterus
21	Continue advancing the forceps gently till the uterine fundus is reached, when a resistance is felt. Feel the uterus through the the abdominal wall with the hand on the abdomen to confirm that the IUCD has reached the uterine fundus.
22	While still stabilizing the uterus, open the forceps, tilting them slightly towards the midline to release IUCD at the fundus.

23	Keep the forceps slightly open and slowly remove them from the uterine cavity by sweeping the forceps to the sidewall of the uterus and sliding the forceps alongside the uterine wall. Care should be taken not to dislodge the IUCD or catch the IUCD strings as the forceps is being withdrawn.
24	Stabilize the uterus until the forceps is completely withdrawn and place the instrument on the sterile drape.
25	Examine to ensure no IUCD or IUCD strings are visible from the cervix. If visible, remove the IUCD and position the sterile IUCD and re insert it.
26	After insertion repair any lacerations (or episiotomy) as necessary.
	POST INSERTION PROCEDURE
27	Allow the woman to rest for a few minutes, and support the initiation of routine post-partum care.
28	Dispose waste material appropriately and answer any questions that the woman may have.
29	Perform hand hygiene.

15.4. APPENDIX 4 CHECKLIST FOR IMMEDIATE POSTPARTUM INSERTION OF CONTRACEPTIVE IMPLANT

INSERTION OF TWO ROD IMPLANTS	
1	Determine that required sterile or high-level disinfected instruments and two implant rods are available
2	Wash hands thoroughly and dry them
3	Wash and dry client's arm. Inform the woman about the procedure and encourage questions
4	Position the womans arm and place a clean dry cloth under her arm
5	Mark position on the arm for insertion of rods 6cm to 8 cm above the elbow folder (this should form a V pattern) put on sterile pair of gloves.
PRE INSERTION TASKS	
6	Set up sterile field and place implant and rods with trocar on it
7	Prepare insertion site with antiseptic solution
8	Place sterile or high level disinfected drape over arm
9	Inject 2mls of 1% lidocaine applied just under the skin, raising a wheal at the insertion point and advancing up to 5cm along the insertion track. Gently massage the area of infiltration.
10	Advance needle about 4 to 5cm and inject 1ml of local anesthetic in each of 2 subdermal tracks.
11	Check for anesthetic effect before making incision
INSERTION	
12	Insert trocar directly sub dermally and superficially
13	While tenting the skin advance the trocar up to mark (1) near the hub of trocar
14	Remove plunger and load first rod with gloved hand or forceps
15	Reinsert plunger and advance it till resistance is felt
16	Hold plunger firmly with one hand and slide trocar out of incision until it reaches plunger handle
17	Withdraw trocar and plunger together until mark 2 near trocar tip just clear off incision but don't remove trocar from skin
18	Move tip away from end of rod and hold rod out of the path of the trocar

19	Redirect the trocar about 15 degrees and advance trocar and plunger to mark 1insert the second rod using the same technique.
20	Palpate incision to check that both rods are 5mm clear of incision. Remove trocar only after insertion of second rod.
21	Ask the woman to palpate the two rods prior to dressing
POST INSERTION TASKS	
22	Remove drape and wipe the skin with alcohol
23	Bring edges of incision together and bridge with surgical tape then cover with band aid.
24	Apply pressure dressing snugly
25	Safely dispose waste material
26	Remove gloves turning inside out and place in leak proof container.
27	Wash hands thoroughly and dry them
28	Complete client records and answer any question she may have
POST INSERTION COUNSELLING	
29	Instruct client regarding wound care and make return visit appointment if necessary
30	Discuss the expected side effects and management or danger signs requiring return to hospital
31	Assure client that she can have the rods removed when she desires.
32	Document on the patient file and complete the client card.

15.5. Approval letter from ethics committee