

**UPTAKE OF LONG-ACTING REVERSIBLE CONTRACEPTIVE METHODS
AMONG WOMEN RECEIVING POST-ABORTION CARE IN MOI
TEACHING AND REFERRAL HOSPITAL, ELDORET.**

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**THESIS SUBMITTED TO MOI UNIVERSITY SCHOOL OF MEDICINE IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD
OF THE DEGREE OF MASTER OF MEDICINE REPRODUCTIVE
HEALTH.**


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DECLARATION

Declaration by the Candidate

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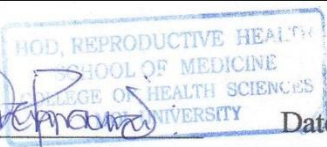
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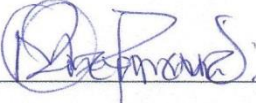
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DEDICATION

I dedicate this research to all those who inspired me along the way to acquisition of knowledge.

And to my dear parents for the gift of education.

ABSTRACT

Background: In Kenya, 41.9% of all pregnancies are unintended and 14% of these end in unsafe abortions and about 3000 deaths annually, accounting for 8% of all maternal mortalities. The use of effective immediate post-abortion contraception such as long acting reversible contraceptives (LARC) reduces the number of subsequent unintended pregnancies, repeat abortions and maternal complications including deaths. Despite these benefits, its uptake in the immediate post abortion period remains low in Kenya. The actual uptake of post abortion LARC and factors that influence its choice in Moi Teaching and Referral Hospital (MTRH), Eldoret is unknown.

Objectives: To determine the proportion of women in the immediate post abortion period who would choose LARC and the factors that influence their choice at Moi Teaching and Referral Hospital, Eldoret.

Methods: A cross-sectional study where 526 women who received post abortion services between 1st of August 2021 and 28th of July 2022 in Faraja ward of MTRH were systematically sampled. Contraceptive counselling was done and the selected method issued. Data on sociodemographic, obstetric and family planning characteristics was collected using a structured interviewer administered questionnaire. Associations between these factors and uptake of LARC were tested on bivariate analysis using binary logistic regression, significance was accepted at a p value ≤ 0.05 . Those found to be significant were fitted into the multivariate logistic regression model.

Results: The proportion of women who chose a modern contraceptive method was 54.9% (289/526) with 19.2% (102/526) choosing LARC methods. The distribution of contraceptives chosen include 16% Depo Provera injection, 15.6% combined oral contraceptive pills, 15.2% progesterone contraceptive implants, 4% Intrauterine device (IUCD), 3% male condoms and bilateral tubal ligation (BTL) at 1.1%. Factors found to be significantly associated with LARC uptake were being unemployed {aOR 2.6 CI (1.51-4.64) p=0.001}, previous LARC use {aOR 3.53 CI (1.84-6.76) p<0.001}, desire to delay next pregnancy for 2 or more years (aOR 5.72 CI (2.68-12.16) p <0.001}, having boys or having both girls and boys as living children {aOR 2.92 CI (1.18-7.24) p=0.021} and belief that LARC offers long term contraception {aOR 3.61 CI (2.1-6.21) p<0.001}.

Conclusion: Post abortion LARC uptake at MTRH is low compared to similar studies carried out in the region. Factors significantly associated with increased uptake of LARC include, belief that it offers long term contraception, gender of living children as either boys or both boys and girls, previous LARC use, being unemployed and desire to delay next pregnancy for 2 or more years.

Recommendation: Routine contraceptive counselling on a wide range of available contraceptive methods including LARC for post abortion women. This may reduce missed opportunities and reduce the unmet need for family planning.

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LIST OF ABBREVIATIONS

BBT	Basal Body Temperature
BTL	Bilateral Tubal Ligation
CAC	Comprehensive Abortion Care
CAR	Central African Republic
COC	Combined Oral Contraceptives
ECP	Emergency Contraceptive Pills
FP	Family Planning
IREC	Institutional Research and Ethics Committee
IUCD	Intra Uterine Contraceptive Device
IUD	Intra Uterine Device
KDHS	Kenya Demographic Health Survey
LAM	Lactational Amenorrhea Method
LARCs	Long-acting Reversible Contraceptives
MEC	Medical Eligibility Criteria
MMR	Maternal Mortality Ratio
MSF	Médecins Sans Frontières
MTRH	Moi Teaching and Referral Hospital
PAC	Post Abortion Care
PAFP	Post Abortion Family Planning
PID	Pelvic Inflammatory Disease
RH	Reproductive Health
SDGs	Sustainable Development Goals
SDM	Standard Day Method
SRHS	Sexual Reproductive Health Services

STD/STI	Sexually Transmitted Disease/Infection
UNFPA	United Nations Populations Fund
UPA	Ulipristal Acetate
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

Abortion refers to termination or loss of pregnancy before 20 weeks of gestation (WHO). However, Kenya defines viability from 28 weeks of gestation. In this study, abortion will refer to loss or termination of pregnancy before 28 weeks of gestation. The abortion may be spontaneous or induced.

Comprehensive Abortion Care includes the provision of information, abortion management and post-abortion care. It encompasses care related to spontaneous, missed, induced and incomplete abortion as well as fetal death (WHO).

Family planning awareness was defined as participant having heard of or knowing about any contraceptive method. Mentioning any modern contraceptive method was considered awareness.

Implants are one or more small rods containing progestin that are implanted under the skin of a woman's upper arm and release a steady dose of progestin thus preventing pregnancy. They include Implanon, a single rod whose contraceptive effect lasts for three years and Jadelle, two subdermal rods whose contraceptive effects lasts for five years.

IUD is a T shaped contraceptive devices placed in the uterus to prevent pregnancy. They include hormonal intra-uterine systems and copper intra-uterine device. The copper intra-uterine device was used in this study.

Immediate post abortion period is the period immediately following an abortion up to one month after. In this study, this period is defined as that occurring between receiving abortion care and discharge from the hospital but within seven (7) days.

LARC are long acting reversible contraceptives are defined as any method of contraception that does not have to be used or applied more than once a cycle or once a month. These include the three monthly Depo Provera injection, contraceptive intrauterine devices and progesterone Implants. In this study, IUCD and implants will be considered as LARC, while Depo Provera will be considered short acting.

Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes (ICD-10).

Medical Eligibility Criteria (MEC) is an evidence-based source of clinical guidance for the safe use of contraceptive methods by women and men with various characteristics and pre-existing medical conditions. It is intended to assist health-care providers when they counsel women, men, and couples about contraceptive method choice.

Modern family planning (contraceptive) methods include oral contraceptive pills, implants, injectables, contraceptive patch, vaginal ring, intrauterine devices, female and male condoms, female and male sterilization, the diaphragm, cervical cap, spermicidal agents, lactational amenorrhea method (LAM), emergency contraception pills, standard days method (SDM), basal body temperature (BBT) method, Two Day method and sympto-thermal method. In this study, COCs, IUCD, male condoms, implants, Depo Provera, and tubal ligation were considered as modern contraceptive methods.

Post-abortion care (PAC):

Post abortion care is an integrated package of care for women who have had an abortion with or without its complications. It includes emergency treatment, counselling,

contraceptive and family planning counselling and provision, linkages to other RH services and community linkages.

Post-abortion family planning

Post abortion family planning (PAFP) defined as the use of any modern method of contraception in the prevention of unintended pregnancy and closely spaced pregnancies through the first 12 months following loss of a pregnancy(*National Family Planning Guidelines for Service Providers Ministry of Health, Division of Family Health F RMHSU, Oct 2018. Print., (2014), 2018*). For purposes of this study, the post abortion period will refer to the first 7 days following pregnancy loss.

Short acting contraceptive methods are contraceptives whose effects last for a short period of time, typically not more than one menstrual cycle. Examples include combined oral contraceptive pills(COCs), progesterone only pill, combined monthly injection, vaginal ring, emergency pill, and barrier methods such as female and male condoms and diaphragm. In this study, Depo Provera, a three monthly progestin only injection will be considered a short acting contraceptive method. This is because its effectiveness in preventing pregnancies is similar to short acting contraceptive methods.

Unsafe abortion A procedure for terminating an unintended pregnancy either by persons lacking the necessary skills or in an environment lacking the minimal medical standards or both (WHO 1993).

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Globally, between the years 2015 and 2019, approximately 121 million unintended pregnancies occurred annually. Of these, 61%, translating to about 73 million pregnancies, ended up in abortions (Bearak J et al., 2022). According to the United Nations Populations Fund (UNFPA) report of 2022 on the unseen crisis of unintended pregnancies, 45% of all the abortions that take place in the world are unsafe. These unsafe abortions contribute to 5-13% of all maternal mortalities that are mostly preventable. The maternal mortalities attributable to abortions have an impact on the attainment of Sustainable Development Goals (SDGs) (Baker et al., 2022). Additionally, RCOG reported 22 million unsafe abortions occur annually resulting in 47,000 deaths and 5 million cases of severe morbidity (RCOG, 2016). In view of the above global statistics the Guttmacher-Lancet commission recommends a comprehensive package of sexual reproductive health services (SRHS) including contraception and safe abortion services in order to reduce unintended pregnancies and unsafe abortions which in the long run will improve maternal health indicators related to abortions (Bearak et al., 2020).

Calvert et al in a meta-analysis looking at the magnitude and severity of abortion-related morbidity in settings with limited access to abortion services involving 70 studies concluded that at least 9% of abortion-related hospital admissions have a near-miss event and approximately 1.5% end in death (Calvert et al., 2018). In another study conducted by MSF in Nigeria and Central Africa Republic (CAR), both of which are ravaged by conflict, the rates of severe complications related to abortion was high at 19.8% with a near miss or death rate of 6.2%. This was attributed to greater delays in

accessing post abortion care, reduced access to contraceptives and safe abortion care which led to an increased rate of unsafe abortions. Additionally, food insecurity is rampant in such areas of civil unrest. This causes nutritional deficiencies that results in chronic iron deficiency anemia. All these are associated with severe complications including death among abortion related cases(Pasquier et al., 2023). In a similar study conducted in a comprehensive University Hospital in Ethiopia, assessing the magnitude of severe acute maternal morbidity and associated factors, the rates of severe morbidity and near miss events were 35.6% and 17.7% respectively. These rates are as high as those found in conflict ravaged countries despite Ethiopia being a relatively stable country. Factors that were found to be significantly associated with these severe and fatal outcomes were second trimester abortions, being uneducated and delayed presentation for care(Tariku, 2020).

Despite improvements in several key health indicators over the past decades, maternal mortality and morbidity has remained high in Kenya. A significant proportion of these deaths and morbidities is driven by complications of unsafe abortion partly due to restrictive and punitive laws surrounding the management of abortions and societal values that frown upon it (Calvert et al., 2018). A Kenyan national study that looked at the Incidence and Complications of Unsafe Abortion and its costs was carried out in 2012. Approximately half a million induced abortions took place that year with about 160,000 cases receiving care for abortion related complications, majority of which were as a result of induced abortions at 120,000 cases. More than three quarters (77%) of these cases had moderate to severe complications, majorly involving teenagers, divorced women and those who had initiated termination of the pregnancy. These cases with severe complications were found to exert undue pressure to the existing public health facilities and health infrastructure including human resources. If prevented, the

health facilities would be redirected to other areas of need. It was also noted that 70% of these patients were not on any contraceptive method. This denotes a gap in the unmet need for family planning among these women, which may have contributed to unintended pregnancies that ended up in unsafe induced abortions with its attendant complications (African Population and Health Research Center, Ministry of Health, Kenya, Ipas, 2013). Similarly, in another cross-sectional study involving 54 referral facilities looking at the incidence of maternal near miss events in Kenya, abortions contributed to 12% of all maternal deaths and 9% of all the near miss events. This makes abortion one of the significant contributors to maternal mortalities (Owolabi et al., 2020). In the first report on the Confidential Enquiry into Maternal Deaths in Kenya that focused on deaths that occurred in major county and national referral hospitals in 2014, abortion related deaths accounted for 8% of all the maternal deaths. It was the fourth leading cause of maternal mortality after obstetric hemorrhage, hypertensive disorders and sepsis. Of all these causes of maternal mortalities, abortion related mortalities are the most preventable by embracing safely induced abortions and quality post abortion care including contraceptives (Ministry of Health [Kenya] & Ministry of Health, 2017). All these show that abortions resulting from unintended pregnancies result in significant preventable maternal morbidity and mortality that affect attainment of SDGs.

The use of contraceptives as part of the essential elements of comprehensive abortion care (CAC) has been shown to substantially reduce the number of subsequent unintended pregnancies, repeat abortions and maternal complications including deaths. World Health Organization (WHO) recommends that, following an abortion, all women should receive contraceptive information and counseling, including emergency contraception, before leaving the health care facility. All women seeking abortion and

delivery services should receive counseling on a wide range of contraceptive methods including short-acting, long-acting reversible and non-reversible (permanent) methods and the woman should be supported in making an informed choice of an appropriate contraceptive method (WHO, 2023). The government of Kenya, through the National Family Planning Guidelines, recognizes that the contraceptive prevalence has been improving over time. In its latest guideline, it places more emphasis on improving access to quality FP services including expanding the available method mix and ensuring there are no missed opportunities to provide contraceptives to women of reproductive age. In addition, reducing the proportion of women with unmet FP need and increasing the number of new users of modern contraceptive methods thereby sustaining the gains made in provision of modern contraceptives. It further recognizes comprehensive sexual reproductive health services, including family planning information and services, improves the overall health of women. Kenya has also set out to increase the proportion of women using modern contraceptives through various strategies such as immediate postpartum FP packages and comprehensive Post Abortion Care (PAC) services which includes FP (*National Family Planning Guidelines for Service Providers Ministry of Health, Division of Family Health F RMHSU, Oct 2018. Print., (2014), 2018*).

Fertility returns quickly following an abortion, ranging from as early as 8-21 days' post abortion. If a woman wishes to delay or prevent a subsequent pregnancy, ideally she should start contraception immediately after the abortion (Benson et al., 2018). Hormonal methods including oral contraceptive pills, injectable, and the subdermal implant may be given with the first dose of mifepristone or misoprostol in the case of medical abortion. Following vacuum aspiration, all methods, including IUDs and implants, may be initiated immediately following an uncomplicated first- or second-

trimester procedure. In septic abortion, IUD insertion should be delayed until recovery (Ipas, 2019).

RCOG and WHO recommend the use of LARC in the immediate post abortion period. The advantages associated with the use of immediate post abortion LARC include certainty that the woman is not pregnant at that time, they are thought to be highly motivated to use an effective contraceptive method especially if it was an unintended pregnancy that ended up in an induced abortion. Finally, because the woman is already in a health facility, it is convenient for her to receive a contraceptive method at that point so that there will be no need for another visit to the hospital. It has been shown that approximately 50% of those who schedule a hospital visit at a later date from the day of abortion treatment for IUCD insertion do not return to the hospital for it. The use of immediate post abortion LARC has been associated with a higher uptake and continuation rates for both IUCD and implants compared to if it is given 2-4 weeks later. Lastly, immediate post abortion LARC is associated with reduced likelihood of repeat abortion in the subsequent 2 years compared to when short acting methods or no contraception is given. (Faculty of Sexual and Reproductive Healthcare, 2017).

Long-acting reversible contraceptives (LARCs), namely, intra-uterine devices and subdermal implants, are considered relatively safe, effective with a failure rate of less than 1%, and cost-effective in the long run. Contrary to these positive attributes and satisfaction rates and attitudes, LARC uptake as a primary contraceptive method remains minimal. Researchers identified this resistance to change to a LARC method, regardless of its favorability among current non-LARC users, as the paradox of inertia. The paradox of inertia identifies the phenomenon of acknowledging LARC as a superior choice and perceiving significant disadvantages of the short acting methods, yet resisting to switch to a LARC method (Demaria et al., 2019). This may be due to

familiarity with the said short acting methods and fear of unknown effects of the unfamiliar long acting methods. Probably a case of better the devil you know, than the angel you don't.

The global LARC use among women of reproductive age is low at about 15% (Caetano et al., 2020). In sub-Saharan Africa, it is estimated to be 20.1%, which is still low (Negash et al., 2022). In Kenya, according to the KDHS report of 2022, IUCD use stood at 4.4% while implants were at 18.5%. This represents a slight improvement from the figures as reported in the 2014 report where IUCD use was at 3.4% and that of implants was 9.9%. (National Bureau of Statistics Nairobi, 2023). In Uasin Gishu, where MTRH is located, the IUCD and implant uptake were 5.8% and 23.2% respectively (KDHS, 2023). This was an improvement from the results of the 2014 survey where the IUCD prevalence was 2.9% and implants were at 7.2%. This still emphasizes the fact that LARC uptake in the general population is still low.

At hospital level, Mogeni et al in 2015, while looking at uptake of implants in the immediate postpartum period among women delivering at MTRH, found an uptake of 44.6%. On the other hand, Oyugi et al in 2016, while looking at uptake of post-partum IUCD, reported an uptake of 15.8%. Finally, Kosgei et al in 2015 while assessing components of post abortion care documented a desire to use IUCD and Implant of 34% and 28% respectively.

Narrowing down to the immediate post abortion modern contraceptive and LARC uptake, the situation is still the same as the general uptake. In a study involving young women across 10 countries in Asia and Sub-Saharan Africa, conducted between 2011 and 2015, with a study population of 921,918 clients, the immediate post abortion modern contraceptive uptake was 77%. Amongst these, only 18% of those older than

25 years of age chose a LARC method while a majority of the participants selected oral contraceptive pills, which are short acting contraceptives(Benson et al., 2017). Regionally, a meta-analysis of 70 studies involving 70,000 participants in Eastern Africa found a post abortion contraceptive utilization of 68.76% with depo injection (considered as a short acting contraceptive method in this study but seen as long acting in some studies) being the most commonly selected method followed by implants at 24.71%(Bizuneh & Azeze, 2021b). In Kenya, in a study in the western region seeking to find out the post abortion contraceptive uptake for planned and unplanned pregnancies, found a post abortion LARC uptake of 8.7% with a modern contraceptive uptake of above 70%. This shows that most of the participants preferred short acting contraceptive methods (Rehnström Loi et al., 2020). There are no studies that have been conducted in MTRH looking at post abortion LARC. This study, therefore, aims to establish the uptake of LARC and the factors influencing its choice among women seeking post abortion services in MTRH.

1.2 Problem statement

According to the WHO analytical fact sheet on maternal mortality of 2023, Kenya's Maternal Mortality Ratio(MMR) rose to 530/100,000 live births in 2020. This is against a global MMR of 210/100,000 live births(World Health Organization, 2023). According to the Confidential Enquiry into Maternal Mortality Report of 2018 in Kenya, abortion related deaths are the 4th leading cause of maternal mortality accounting for 8.3% of all maternal deaths(Ministry of Health [Kenya] & Ministry of Health, 2017). Comprehensive abortion care, which includes contraceptive counselling and provision, is a proven high impact intervention that reduces maternal morbidity and mortality significantly. Use of LARC in the immediate post-abortion period has been shown to reduce the rate of repeat abortions by 2-3 times, which in turn reduces the rate

of complications associated with abortions(World Health Organization, 2019). If implemented effectively, the maternal morbidity and mortality attributable to abortions would significantly reduce. This reduction would therefore improve the national MMR, as envisaged in sustainable development goal 3.1 that aims to reduce maternal mortalities to less than 70/100,000 live births by the year 2030.

Despite the known advantage, proven high efficacy and provision of these contraceptives almost free of charge in public hospitals in Kenya, the general uptake of LARC, especially in the post abortion period remains low. In western Kenya, only 20.6% utilized LARC methods in a study carried out in Kakamega among women of reproductive age seeking contraceptive services, while in a similar study in Kisumu 7% chose implants while only 1% chose IUCDs. This points to un-addressed barriers to utilization of long-acting contraceptive methods. The proportion of women using LARC in the immediate post abortion period and factors contributing to the low uptake in this region is largely unknown.

In MTRH, despite contraceptive counselling and provision of these contraceptives to women seeking post abortion care, the exact uptake of LARC is not known. No previous study has been conducted to look at the uptake of LARC and to identify the factors that influence its choice. This study, therefore sought to determine the proportion of women who would use LARC and to establish the factors that influence their choice.

1.3 Research Questions

1. What is the proportion of women in the immediate post-abortion period who would choose a modern contraceptive method at Moi Teaching and referral Hospital, Eldoret?
2. What proportion of women in the immediate post abortion period would choose LARC at Moi Teaching and Referral Hospital, Eldoret?
3. What are the factors that influence their choice of LARC among women receiving post abortion care at Moi Teaching and Referral Hospital, Eldoret?

1.4 Justification of study

Unsafe abortions resulting from unintended pregnancies are the fourth leading cause of maternal mortality both globally and in Kenya hence significantly contributing to maternal morbidity and mortality. Additionally, maternal mortality attributable to abortions is preventable by use of comprehensive abortion care that includes safe abortion induction services and effective post abortion services including contraceptive counselling and provision.

Use of effective contraception, particularly LARC, in the immediate post abortion period has been proven to reduce repeat abortions from unintended pregnancies with high continuation rates. This leads to reduced maternal morbidity and mortality attributable to abortions.

Despite the proven benefits of using LARC among post-abortion women in reducing morbidity and mortality, its use remains low. Understanding the factors that influence uptake of post abortion LARC may improve uptake and in the end reduce maternal deaths attributable to unsafe abortions.

1.5 Study significance

Finding out the actual post abortion contraceptive uptake among women seeking post abortion services in our set up will provide the baseline data on uptake and hence fill the knowledge gap. This information will be useful in assessing utilization of post abortion contraceptive services in our set up and add to the body of knowledge in the region.

The data collected on the factors that influence utilization of post abortion contraceptives, especially LARC has the potential to raise awareness on some of the reasons why LARC uptake is low. This would therefore help inform implementation of strategies to improve uptake.

At healthcare providers level, this information may be useful in informing the counselling strategy to specifically address any fears, myths, misconceptions and cultural biases towards contraceptives and their utilization.

At facility level, the study findings may help address any issues related to infrastructure, commodity supply, staff training and attitudes aimed at improving access and promoting uptake of post abortion contraception.

1.6 Study Objectives

1.6.1 Broad Objective:

To determine the uptake of Long acting reversible contraceptive methods in the immediate post abortion period and the factors that influence their choice at the Moi Teaching and Referral Hospital, Eldoret

1.6.2 Specific Objectives:

1. To determine the proportion of women in the immediate post abortion period who would choose a modern contraceptive method at the Moi Teaching and Referral Hospital, Eldoret.
2. To determine the proportion of women who would chose LARC (IUCD and Implants) in the immediate post abortion period at the Moi Teaching and referral Hospital, Eldoret.
3. To identify the factors associated with uptake of LARC among women in the immediate post abortion period at the Moi Teaching and Referral Hospital, Eldoret.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Abortions and Unintended Pregnancies

2.1.1 Unintended Pregnancies

Unintended pregnancies are defined as pregnancies which occurs to a woman who was not planning to have any more children or was mistimed, in that it occurred earlier than desired(Baker et al., 2022). Globally, 121 million unintended pregnancies occur annually, representing almost a half of all pregnancies. Of all these, approximately 61% of them end up in induced abortions. Additionally, one third of all pregnancies, whether intended or unintended, end up in induced abortions. This has been described as a silent pandemic that requires action (Bearak et al., 2020)(WHO, 2021.). The burden of unintended pregnancies is higher in developing countries than the developed ones. Almost half of the abortions that occur as a result of these unintended pregnancies are classified as unsafe with severe morbidity and mortality(E. Pasquier, O. Owolabi, T. Fetters, H. Chen, T. Williams, D. Lagrou, C. Schulte-Hillen, C. Fotheringham, B. Powell, L. Nguengo, A. Dodane, M. Adame Gbanzi, E. Baudin, A. Moore, 2022).

Unintended pregnancy usually occurs due to issues related to contraceptives such as contraceptive failure in 33.1% of cases, incorrect use in 28.6% of the cases and use of the rhythm method in 21.9% of the cases (Luo et al., 2018). Most unintended pregnancies occur in developing regions with limited access to safe abortion care (Langston et al., 2014).

Unintended, teen, and rapid repeat pregnancies have a substantial negative health and socioeconomic impact on women and their families. These include higher rates of maternal depression, intimate partner violence, anemia, low birth weight infants and lower rates of breastfeeding. Long-term developmental outcomes include poor

behavioral, mental, and physical health for the children. In addition, lower educational attainment for the mothers, fathers, and their children lead to higher rates of poverty.(Caitlin PARKS, MD and Jeffrey F. PEIPERT, MD, 2017)

The biggest contributor to unintended pregnancies is believed to be unmet need for family planning, followed by contraceptive failure. Although the proportion of women of reproductive age with unmet need for family planning in Kenya has been going down, the latest figure is 14% still represents a significant proportion of women(National Bureau of Statistics Nairobi, 2023).

Comprehensive sexual reproductive health services consisting of contraceptive counselling and provision has been shown to reduce unplanned pregnancies and abortions. This in turn reduces the rate of maternal morbidity and mortality attributable to abortions(Baker et al., 2022).

2.1.2 Abortions

Approximately 73.3 million abortions occur annually worldwide as a result of unintended pregnancies. Of these 8 million take place in sub-Saharan Africa. Globally, approximately 45.1% abortions are unsafe, with approximately three quarters of all abortions occurring in the African region being classified as unsafe. In the region, almost all unsafe abortions were categorized as least safe, defined as abortion service provided by untrained individuals using a dangerous method. The highest proportion of least safe abortions occurred in middle Africa, followed by West Africa and East Africa(Qureshi et al., 2021).

Abortion is defined as loss of a pregnancy before viability. The definition of viability varies depending on the region of the world. For developed countries, viability is defined as loss of pregnancy below 20 weeks of gestation. WHO, however defines

viability as pregnancy beyond 28 weeks(WHO, 2023). Unsafe abortions are defined by WHO as a “procedure for termination of a pregnancy done by an individual who does not have the necessary training or in an environment not conforming to minimal medical standards”. However, abortions done in accordance with these standards are considered safe and the risk of severe complications or death is minimal. WHO classifies abortions into 3 categories in accordance to their level of safety as safe, less safe and least safe abortions. Safe abortion is defined as abortion services provided by a trained health-care workers using methods that are recommended by WHO, like vacuum aspiration, use of mifepristone and misoprostol or use of misoprostol alone in the absence of mifepristone. Less-safe abortion is described as abortion services carried out by a trained healthcare provider using non-recommended methods or using WHO safe recommended methods like misoprostol but without adequate information or support from a trained individual. Lastly, least-safe abortion is carried out by untrained people using dangerous, invasive methods and are the ones associated with the highest rate of maternal morbidity and mortality. In a study published in 2017 looking at the global, regional and sub-regional classifications by safety, the global statistics were as follows; safe abortions 54.9% of all abortions, less safe abortions accounted for 30.7%, while least safe abortions were 14.4%. In the developed countries, the safe abortions represented about 87.5% of all abortions while the least safe abortions were only 0.08% with a total unsafe abortion proportion of 12%. On the opposite end of this spectrum are statistics from the developing world and specifically Africa, where the proportion of safe abortions was 24.4% with almost half of the abortions being classified as least safe at 48.0%. In essence three quarters of all abortions that take place in Africa are considered unsafe at 75.6% (Ganatra et al., 2017). These figures, then explain the

gravity of unintended pregnancies, induced abortions with its complications including death, contributing to the high maternal mortality ratios in the region Kenya included.

Types of Abortions

Abortions can be spontaneous or induced, threatened, inevitable, incomplete, complete, missed, blighted ovum or habitual. Most often, the above mentioned types are a continuum of clinical signs in the spectrum of abortions.

Spontaneous abortions

This is defined as loss of products of conception before 20 weeks of gestation without external interference. The socially acceptable terminology is a miscarriage. Causes of spontaneous miscarriages are thought to be due to chromosomal abnormalities and uterine structural anomalies like bi-cornuate uterus. Some of these spontaneous abortions may be as a result of viral infections like cytomegalovirus, herpesvirus, parvovirus, and rubella virus. Others may be due to immunologic abnormalities and major physical trauma. In most cases, at individual level, the cause is not known(Dulay, 2017).

The risk factors for spontaneous abortion include extremes of maternal age with the highest risk occurring above 45 years of age at 57%, previous spontaneous abortion, cigarette smoking, use of substances of abuse like cocaine and alcohol. Poorly controlled maternal chronic diseases like hypertension, thyroid disease, diabetes and renal disease have also been shown to predispose mothers to an increased risk of spontaneous abortions(Magnus et al., 2019).

Management of spontaneous abortions depends on the clinical presentation on the continuum from threatened to complete abortion. This will be discussed subsequently under each of the clinical types of abortion.

Induced Abortion

This is the deliberate termination of pregnancy by either a healthcare practitioner due to health indications like intrauterine fetal death, fetal anomalies incompatible with extra-uterine life or poorly controlled maternal condition. Induction of abortion may also be initiated by the pregnant woman because it is unwanted with no intention of getting a live birth. The induced abortions may either be safe or unsafe(WHO, 2023).

Safe abortions are carried out in a hospital environment under the supervision of a trained and qualified health professional using safe methods. They are associated with very minimal rates of complications. Unsafe abortion on the other hand is performed by unqualified personnel within or without a hospital using crude and dangerous methods with a potential for severe complications including death. Most of those who have unsafe abortions present to healthcare facilities for management of complications such as bleeding, severe anemia, sepsis, genital tract trauma i.e. uterine perforation and gut injuries(African Population and Health Research Center, Ministry of Health, Kenya, Ipas, 2013)(E. Pasquier, O. Owolabi, T. Fetters, H. Chen, T. Williams, D. Lagrou, C. Schulte-Hillen, C. Fotheringham, B. Powell, L. Nguengo, A. Dodane, M. Adame Gbanzi, E. Baudin, A. Moore, 2022).

Induced abortions follows the continuum of clinical presentations just like what we see in spontaneous abortions, namely threatened, inevitable, incomplete, complete or septic. The management therefore will depend on where on this continuum the patient presents for care.

Threatened Abortion

This is where vaginal bleeding occurs before viability without cervical dilatation in the setting of a positive pregnancy test and an ultrasound confirming fetal viability. About 20% of early pregnancies present with vaginal bleeding but only half of these end up in abortions. Threatened abortions should be managed expectantly. Use of progesterone, though rampant has not been shown to improve outcomes. Bed rest is also not recommended. Women at risk of allo-immunization should receive anti-D (Dulay, 2017).

Inevitable Abortion

This diagnosis is made when a pregnant woman presents with severe abdominal cramping with bleeding that is typically worse than that seen in threatened abortion. On pelvic examination the cervix is open. Ultrasonography usually shows products of conception in the lower uterine segment. Management is to complete the abortion either medically if above 12 weeks or both medically and surgically if it is below 12 weeks of gestation through vacuum aspiration either manually or electrically. Assessment for complications like anemia and sepsis(Puscheck EE, 2018).

Incomplete Abortion

A form of early pregnancy loss associated with intense uterine cramping, heavy vaginal bleeding and partial passage of products of conception vaginally. Vaginal examination may reveal products of conception in the vagina or in the open cervix. Ultrasound shows some products of conception in the uterus. Management is similar to what is done in inevitable abortion with either medical or surgical evacuation followed by management of complications like severe anemia and sepsis(Puscheck EE, 2018)(WHO, n.d.).

Complete Abortion

Complete abortion is when there is complete expulsion of products of conception. The patients will report having had cramping lower abdominal pains that increased in intensity but subsided after passing clots and conceptus vaginally. Pelvic examination reveals minimal bleeding and the cervix is closed. Management in such cases is to offer post abortion care including antibiotics, contraceptive counselling and linkages to other services(DC. Dutta's, 2013)(WHO, 2023).

Missed Abortion

This is a type of abortion in which the fetus or embryo dies but remains in utero with minimal vaginal bleeding or no signs or symptoms and the cervix is usually closed. It is mainly seen on ultrasound. Treatment is by medical termination using drugs to induce labor through uterine contractions and cervical dilatation leading to expulsion of products of conception. This may be achieved through use of mifepristone 200mg followed by misoprostol 24 to 48 hours later till expulsion of products of conception. In the absence of mifepristone, misoprostol can be used alone(WHO, 2023).

Septic Abortions

Septic abortion, is any of the above mentioned types of abortions accompanied with signs of infection. These signs include, a fever, foul smelling vaginal discharge, uterine tenderness, tachycardia, and elevated white cell counts on laboratory investigations. These patients require antibiotics to treat the infection. In terms of contraceptives, intrauterine devices are contraindicated in such patients until the sepsis is treated(Tariku, 2020).

Recurrent Abortions

Also known as habitual miscarriages. Represents 2 or more consecutive spontaneous abortions. Affects approximately 1% of all pregnancies. Risk factors include previous miscarriages with risk increasing with an increase in the number of miscarriages to about 40% after 3 consecutive miscarriages. Advanced maternal age presents with more than 90% risk of recurrent abortions in women above 45 years of age.

Conditions associated with this phenomenon include anti-phospholipid syndrome, poorly controlled diabetes, thyroid disorders, fetal and parental chromosomal disorders congenital uterine anomalies and cervical incompetence.

Investigations and management options are diverse and dependent on the cause of the recurrent losses(RCOG, 2011)(Magnus et al., 2019).

Management options

For cases of elective induction of abortions and those with incomplete abortion, there are several options of management. These are either medical or surgical management.

Medical Management of Abortions

Medical management entails use of mifepristone 200mg orally followed by misoprostol 24 to 48 hours later or misoprostol only. The dosage of misoprostol is dependent on the gestational age at the time of abortion as shown in figure 1 and 2 below. Medical management is used in cases of missed abortions, elective termination of pregnancy both in the first and second trimesters and management of 2nd trimester incomplete abortions. Medical management can be carried out by the patient at home (self-care)(WHO, 2023).


Mifepristone & Misoprostol Dosing Chart Recommended Regimens 2023					
					
≤12 weeks	13-17 weeks	18-24 weeks	25-27 weeks	≥28 weeks	Postpartum Use
Induced Abortion Mifepristone 200mg PO Wait 1-2 days then, Misoprostol 800µg BU/SL/PV x1 ≥10 weeks give misoprostol 800µg BU/SL/PV every 3 hours until expulsion ¹	Induced Abortion Mifepristone 200mg PO Wait 1-2days then, Misoprostol 400µg every 3 hours BU/SL/PV until expulsion ⁵	Induced Abortion Mifepristone 200mg PO Wait 1-2 days then, Misoprostol 400µg every 3 hours BU/SL/PV until expulsion ⁵	Induced Abortion Mifepristone 200mg PO Wait 1-2 days then, Misoprostol 200µg every 4 hours until expulsion BU/SL/PV ^{5,9}	Induced Abortion Mifepristone 200mg PO Wait 1-2 days then, Misoprostol 50-100µg every 4 hours PV OR Misoprostol 50-100µg every 2 hours PO ^{6,9}	Prophylaxis of Postpartum hemorrhage (PPH) Misoprostol 600µg SL x 1
Missed Abortion/ Anembryonic Pregnancy Mifepristone 200mg PO Wait 1-2 days then, Misoprostol 800µg BU/SL/PV x1 ≥10 weeks give misoprostol 800µg BU/SL/PV every 3 hours until expulsion ¹	Missed Abortion Mifepristone 200mg PO Wait 1-2 days then, Misoprostol 400µg every 3 hours BU/SL/PV until expulsion ⁵	Fetal Demise Mifepristone 200mg PO Wait 1-2 days then, Misoprostol 400µg every 3 hours BU/SL/PV until expulsion	Fetal Demise Mifepristone 200mg PO Wait 1-2 days then, Misoprostol 200µg every 4 hours BU/SL/PV until expulsion ⁵	Fetal Demise Mifepristone 200mg PO Wait 1-2 days then, Misoprostol 25-50µg every 4 hours PV OR Misoprostol 50-100µg every 2 hours PO ⁶	Treatment of Postpartum hemorrhage (PPH) Misoprostol 800µg SL x 1
Incomplete Abortion 400µg misoprostol SLx1 600µg misoprostol PO x1 800µg misoprostol BU x 1 dose ⁵	Incomplete Abortion Misoprostol 400µg every 3 hours BU/SL until expulsion	Incomplete Abortion Misoprostol 400µg every 3 hours BU/SL until expulsion	Induction of Labor Misoprostol 25-50µg every 4 hours PV ^{7,8} OR Misoprostol 25-50µg every 2 hours PO ^{6,7,8}	Induction of Labor Misoprostol 25-50µg every 4 hours PV ⁷ OR Misoprostol 25-50µg every 2 hours PO ^{6,7}	
Cervical Preparation Before Aspiration Not required ²	Cervical Preparation Before Aspiration Misoprostol 400µg 1-3hrs BU/SL/PV before the procedure ³	Cervical Preparation Before D&E (Use of multiple modalities is recommended) Mifepristone 200mg PO & Osmotic Dilators 1-2 days before. ⁴	LEGEND: Buccal(BU) Sublingual (SL) Per Vagina (PV) Per Oral (PO)		
1. <12 weeks induced & missed abortion can be self-managed at home. 2. Consider using 400µg misoprostol 1-2 hours before procedure in patients ≤ 17 years of age. 3. Consider using Osmotic Dilators in patients ≤17 years old or in patients with a stenotic cervix. 4. Can use Misoprostol 400µg 1-2 hours before D&E if mifepristone is not available. 5. Dosing based on Society of Family Planning Guidelines (2011, 2013) A comprehensive systematic review and Meta-Analysis published 2020 6. Dosing based on Cochrane Database Syst Rev. (CD014484) published 2021 7. Buccal and Sublingual Misoprostol is not recommended for induction of labor with viable pregnancies, it is associated with more tachycardia and fetal distress. 8. There is a lack of strong evidence for misoprostol dosing for this indication at this gestational age. 9. Induced fetal cardioplegia should be considered for induced abortion after fetal viability			NOTES: <ul style="list-style-type: none"> • SL/PO route is associated with more side effects. • Avoid vaginal route if there is vaginal bleeding. • Misoprostol is SAFE below 28 weeks EVEN with history of Cesarean Delivery. • Misoprostol is not recommended in women ≥28 weeks gestational age with a prior Cesarean Delivery. • There is NO Maximum dose of misoprostol. If an abortion is not complete after 5 doses, you may continue additional doses or rest for 12 hours and start again • Misoprostol is not contraindicated in grand multipara. • Routine aspiration after medication abortion is not required or recommended. 		

Figure 1: Mifepristone and Misoprostol Dosing Chart adapted from FIGO

<div style="text-align: center;">  <h2 style="margin: 0;">Misoprostol ONLY Dosing Chart</h2> <p style="margin: 0;">(For use ONLY when mifepristone is not available)</p> <h3 style="margin: 0;">Recommended Regimens 2023</h3> </div>					
≤12 weeks	13-17 weeks	18-24 weeks	25-27 weeks	≥28 weeks	Postpartum Use
Induced Abortion Misoprostol 800µg BU/SL/PV every 3 hours until expulsion ¹	Induced Abortion Misoprostol 400µg every 3 hours until expulsion BU/SL/PV ⁴	Induced Abortion Misoprostol 400µg every 3 hours BU/SL/PV until expulsion ⁴	Induced Abortion Misoprostol 200µg every 4 hours BU/SL/PV until expulsion ^{4,8}	Induced Abortion Misoprostol 25-50µg every 4 hours PV ⁸ OR Misoprostol 50-100µg every 2 hours PO ^{5,8}	Prophylaxis of Postpartum hemorrhage (PPH) Misoprostol 600µg SL x 1
Missed Abortion/ Anembryonic Pregnancy Misoprostol 800µg BU/SL/PV every 3 hours until expulsion ¹	Missed Abortion Misoprostol 400µg every 3 hours BU/SL/PV until expulsion ⁴	Fetal Demise Misoprostol 400µg every 3 hours BU/SL/PV until expulsion ⁴	Fetal Demise Misoprostol 200µg every 4 hours BU/SL/PV until expulsion ⁴	Fetal Demise Misoprostol 25-50µg every 4 hours PV ⁹ OR Misoprostol 50-100µg every 2 hours PO ⁵	Treatment of Postpartum hemorrhage (PPH) Misoprostol 800µg SL x 1
Incomplete Abortion 400µg misoprostol SL x 1 600µg misoprostol PO x 1 800µg misoprostol BU x 1 dose ⁴	Incomplete Abortion Misoprostol 400µg every 3 hours BU/SL	Incomplete Abortion Misoprostol 400µg every 3 hours BU/SL	Induction of Labor Misoprostol 25-50µg every 4 hours PV ^{6,7} OR Misoprostol 25-50µg every 2 hours PO ^{3,6,7}	Induction of Labor Misoprostol 25-50µg every 4 hours PV ^{6,7} OR Misoprostol 25-50µg every 2 hours PO ^{5,6,7}	
Cervical Preparation Before Aspiration Not required ²	Cervical Preparation Before Aspiration Misoprostol 400µg 1-2 hours BU/SL/PV before the procedure ³	Cervical Preparation Before D&E (Use of multiple modalities is recommended) Osmotic Dilators 1-2 days before and Misoprostol 400µg BU/SL/PV 1-2 hours before the procedure	LEGEND: Buccal (BU) Sublingual (SL) Per Vagina (PV) Per Oral (PO)		
<ol style="list-style-type: none"> 1. <12 weeks induced & missed abortion can be self-managed at home. 2. Consider using 400mcg misoprostol 1-2 hours before procedure in patients ≤ 17 years of age. 3. Consider using Osmotic Dilators in patients ≤17 years old or in patients with a stenotic cervix. 4. Dosing based on Society of Family Planning Guidelines (20111, 20133) A comprehensive systematic review and Meta-Analysis published 2020 5. Dosing based on Cochrane Database Syst Rev. (CD014484) published 2021 6. Buccal and Sublingual Misoprostol is not recommended for induction of labor with viable pregnancies, it is associated with more tachysystole and fetal distress. 7. There is a lack of strong evidence for misoprostol dosing for this indication at this gestational age. 8. Induced fetal cardioplegia should be considered for induced abortion after fetal viability 			NOTES: <ul style="list-style-type: none"> • SL/PO route is associated with more side effects. • Avoid vaginal route if there is vaginal bleeding. • Misoprostol is SAFE below 28 weeks EVEN with history of Cesarean Delivery. • Misoprostol is not recommended in women ≥28 weeks gestational age with a prior Cesarean Delivery. • There is NO Maximum dose of misoprostol. If an abortion is not complete after 5 doses, you may continue additional doses or rest for 12 hours and start again • Misoprostol is not contraindicated in grand multipara. • Routine aspiration after medication abortion is not required or recommended. 		

Figure 2 misoprostol only Dosing Chart Adapted from FIGO

Surgical Management of Abortions

Surgical management of abortions involves vacuum aspiration both manual using the Karman syringe and electric aspiration, dilatation and evacuation, hysterotomy, and caesarian hysterectomy(WHO, 2023). Vacuum aspiration is the most commonly employed surgical method in our set up. It is mainly used in first trimester abortion management in pregnancies below 12 weeks(WHO, 2023). Figure 3 below shows the Karman syringe with the cannulae used for Manual Vacuum Aspiration(MVA).



Figure 3: Manual Vacuum Aspiration Syringe and Cannulas. Adopted from ASCO med.

Complications of unsafe abortions

WHO classifies complications related to abortions into 5 distinct categories namely mild, moderate, potentially life threatening, maternal near miss event and maternal death(Qureshi et al., 2021).

Mild complications include any abnormal changes in the vital signs, physical examination findings both abdominal and gynecological, mental status and general appearance. These complications are mainly managed supportively with analgesics, intravenous fluids, prophylactic antibiotics and reassurance after completion of evacuation(Bankole et al., 2018).

Moderate complications are described as heavy bleeding, suspected intra-abdominal injuries or infection. These are managed by transfusion in case of heavy bleeding causing symptomatic anemia, intravenous antibiotics and laparotomy to treat intra-abdominal injuries (Bankole et al., 2018)(Pasquier et al., 2023).

Potentially life-threatening complications on the other hand refer to severe hemorrhage, severe systemic infection and suspected uterine perforation. Maternal near miss criteria encompasses organ dysfunction of the cardiovascular, respiratory, renal, coagulation, hepatic, neurological or uterine. Any one of these organ systems being affected is considered a near miss event. Finally, death from these complications is the most severe form of abortion related outcome. The risk of very severe complications increases exponentially among women with unsafe abortions(Qureshi et al., 2021)(Tariku, 2020). These complications require multi-disciplinary approach involving critical care teams, renal physicians, general surgeons etc. according to the affected organ systems.

In order minimize the rate of these complications, post abortion contraceptive counselling and utilization has been shown to be effective. All modern contraceptive

methods are safe for use in the immediate post abortion period except intrauterine devices that are contraindicated in cases of sepsis(Faculty of Sexual and Reproductive Healthcare, 2017).

2.1 Contraception and Family planning

Contraception is the intentional prevention of pregnancy artificially by use of contraceptives or by natural means. Family planning on the other hand allows individuals and couples to anticipate and attain their desired number of children and the spacing and timing of their births. This is achieved through use of contraceptive methods and the treatment of involuntary infertility(*National Family Planning Guidelines for Service Providers Ministry of Health, Division of Family Health F RMHSU, Oct 2018. Print., (2014), 2018*).

Contraceptives are preparations or devices designed to deliberately prevent conception or pregnancy. They include oral contraceptive pills, implants, injectables, patches, vaginal rings, intra uterine devices, condoms, male and female sterilization, lactational amenorrhea methods, withdrawal and fertility awareness-based methods(WHO, 2018).

2.2 Classification of contraceptives

Contraceptives can be traditional or modern.

Modern contraceptives include female and male sterilization, contraceptive pills, intrauterine devices, injectables, implants, the male condom, the female condom, the diaphragm, spermicides, emergency contraception, the lactational amenorrhea method (LAM), and the standard days method (SDM)/beads.

Examples of traditional methods include the rhythm or periodic abstinence method, withdrawal, and local methods such as herbs.

2.3 Modern contraceptive Methods

These can be sub-classified into 5 groups namely long acting reversible contraceptives (LARC), permanent contraception or sterilization, short acting hormonal contraceptives, emergency contraception and barrier methods. These will be discussed briefly in the next section.

2.3.1 Emergency Contraception

Emergency contraception can be used in a number of situations following sexual intercourse to prevent unwanted pregnancies. These include when no contraceptive has been used, sexual assault when the woman was not protected by an effective contraceptive method and when there is concern of possible contraceptive failure, from improper or incorrect use.

There are 4 methods of emergency contraception namely:

Emergency Contraceptive Pills (ECPs) containing ulipristal acetate (UPA)

Ulipristal acetate (UPA) pills are selective progesterone receptor modulators that prevent pregnancy when taken as a single 30-mg dose. They are effective when taken up to 5 days (120 h) following unprotected intercourse, with a pregnancy protection rate of 1.2%. They work by delaying or inhibiting ovulation thereby allowing time for sperms to die off. These pills are generally safe with mild to moderate side effects including headache, abdominal pains, nausea, dysmenorrhea, fatigue and dizziness. They should not be used in pregnant women and breastfeeding mothers. In breast feeding women, if used, the breast milk should be expressed and discarded for the next 7 days. Use of UPA should not be repeated in the same cycle(Fine, 2011)(Black & Hussainy, 2017).

ECPs containing Levonogestrel (LNG)

These are the commonly referred to as morning after pills. They are effective if taken within 72 hours of unprotected sexual intercourse, with a pregnancy prevention rate of 1.2% to 2.1%. Dosage is 1.5mg once or 750mcg taken 12 hours apart. Its efficacy is reduced in obese women with a BMI of more than 30 and in patients on liver enzymes inducers like rifampicin. The side effects are similar to those seen in ulipristal acetate. They are safe to use during breastfeeding but contraindicated in women with severe liver disease, confirmed ongoing pregnancy and hypersensitivity. It is however less effective compared to UPA and IUCD(Black & Hussainy, 2017)(Faculty of Sexual and Reproductive Healthcare, 2017).

Combined oral contraceptive pills

4 tablets of COCs are taken as split doses 12 hours apart within 72 hours of unprotected sex. Each dose consists 2 tablets (100 µg of ethinyl estradiol plus 0.50 mg of LNG). This is also known as the Yuzpe method. Because of the high doses of estrogen, it is associated with a lot of nausea and vomiting hence making it less effective. It is only recommended in the absence of the other emergency contraceptives (*National Family Planning Guidelines for Service Providers Ministry of Health, Division of Family Health F RMHSU, Oct 2018. Print., (2014), 2018*)(Barrier et al., 2015a).

Copper-bearing intrauterine devices.

WHO recommends that a copper-bearing IUD, when used as an emergency contraceptive method, be inserted within 5 days of unprotected intercourse. This method is particularly appropriate for women who would like to start using a highly effective, long-acting, and reversible contraceptive method. It is the most effective emergency contraceptive at more than 99%.

It is a safe form of emergency contraception with estimated less than 2 cases of Pelvic Inflammatory Disease (PID) per 1000 users(WHO, 2018) (FP Global Handbook). The risks of expulsion or perforation are low.

Its use is contraindicated in known ongoing pregnancy, pelvic infection or with current PID, puerperal sepsis, unexplained vaginal bleeding, cervical cancer, or severe thrombocytopenia. In addition, it should not be inserted following sexual assault because of the risk of sexually transmitted infections (STI) like chlamydia and gonorrhoea (WHO Key Fact Sheet Emergency Contraception, November 2021)(Black & Hussainy, 2017).

2.3.2 Barrier Methods

These are removable devices designed to prevent sperms from entering the uterus. They are a good option for women who cannot use hormonal methods of contraception. Failure rates for barrier methods differ depending on the method.

Male condoms.

It is a thin sheath that covers the penis to collect sperms and prevent them from entering the uterus. Male condoms are made of latex or polyurethane, but a natural alternative is lambskin made from the intestinal membrane of lambs.

Apart from contraception, latex or polyurethane condoms are useful in reducing transmission of STIs. Male condoms are disposed of after a single use(*National Family Planning Guidelines for Service Providers Ministry of Health, Division of Family Health F RMHSU, Oct 2018. Print., (2014), 2018*).

Female condoms.

These are thin, flexible plastic pouches. A portion of the condom is inserted into the vagina before intercourse to prevent sperm from entering the uterus. The female condom also reduces the risk of STDs. Female condoms are disposed of after a single use(WHO, 2018).

Contraceptive sponges.

These are soft, disposable, spermicide-filled foam sponges. One is inserted into the vagina before intercourse. The sponge helps blocks sperm from entering the uterus, and the spermicide also kills the sperm cells. The sponge should be left in place for at least 6 hours after intercourse and then removed within 30 hours after intercourse(WHO, 2018).

Spermicides.

A spermicide kills sperm cells. May be used alone or in combination with a diaphragm or cervical cap. The most common spermicidal agent is nonoxynol-9 (N-9). It is available in several concentrations and forms, including foam, jelly, cream, suppository, and film.

A spermicide should be inserted into the vagina close to the cervix 30 minutes prior to planned intercourse and left in place 6 to 8 hours after intercourse to prevent pregnancy.

Disadvantages of spermicides are that they do not prevent the transmission of STIs and may cause allergic reactions.

Diaphragms.

These are shallow, flexible cups made of latex or soft rubber that is inserted into the vagina before intercourse, blocking sperm from entering the uterus. Spermicidal cream or jelly should be used with a diaphragm. The diaphragm should remain in place for 6

to 8 hours after intercourse but it should be removed within 24 hours. Traditional latex diaphragms must be the correct size to work properly, and a health care provider can determine the proper fit. A diaphragm should be replaced after 1 or 2 years. Women also need to be fitted for a new diaphragm following child birth, pelvic surgery, or gaining or losing weight.

Cervical caps.

They are similar to diaphragms but are smaller and more rigid. The cervical cap is a thin silicone cup that is inserted into the vagina before intercourse to block sperm from entering the uterus.

The cervical cap should be used with a spermicide. Once inserted, it remains in place for 6 to 8 hours after intercourse to prevent pregnancy, but it should be removed within 48 hours. Cervical caps come in different sizes determined by a healthcare worker. With proper care, a cervical cap can be used for 2 years before replacement.

2.3.3 Short-Acting Hormonal Methods

These are contraceptives that contain progestin only, or a combination of estrogen and progestin that provide contraception over a short period of time. They require repeated daily, monthly or three monthly doses to maintain contraception. Short-acting hormonal methods (e.g., injectable, pills, patches, rings) are highly effective with perfect use, but have higher failure rates with typical use.

Injectable birth control (progestin only).

Depot medroxyprogesterone acetate (DMPA) is a long-acting injectable formulation of medroxyprogesterone acetate in a crystalline suspension. Pregnancy rates in the first

year are 0.2% with perfect use and about 6% with typical use (ie, delays between injections).

DMPA is available in two different formulations; it may be given as an IM (150 mg) or subcutaneous injection (104 mg) every 3 months. Effective contraceptive hormonal serum levels are usually attained as early as 24 hours after injection and are maintained for at least 14 weeks although levels may be high enough to remain effective for up to 16 weeks.

DMPA may also be given immediately after a spontaneous or induced abortion or immediately postpartum regardless of breastfeeding status.

Examples include *Depo-Provera*, an intramuscular injection that lasts 3 months, *Sayana Press* lasts for 3 months. It's given subcutaneously as a self-administered injection. Lastly, *Noristerat* is an intramuscular injection that lasts for 8 weeks and is less frequently used. It's usually used for short periods of time – for example, when the partner is awaiting a vasectomy.

Noristerat (NET-EN), is a depot injectable formulation of Norethisterone Enanthate in a castor oil benzyl benzoate suspension. Pregnancy rates are the same as with DMPA. NET-EN may be given as an IM injection (200 mg) deep into the gluteal or deltoid muscles, typically every 8 weeks, but the interval can be extended to 12 weeks after the first 6 months of use. Effective contraceptive hormonal serum levels are attained within 72 hours. And like DMPA, NET-EN may also be given immediately after a spontaneous or induced abortion or immediately postpartum, regardless of breastfeeding status.

Adverse effects include irregular bleeding patterns, amenorrhea, weight gain, delayed return to fertility, mood changes with worsening depression and headache.

The non-contraceptive benefits are reduced risk of endometrial cancer, pelvic inflammatory disease and iron deficiency anemia. Additionally, it has no interactions with liver enzyme inducers hence good for use among seizure disorder patients on such drugs.

Progestin-only oral contraceptives pills

Commonly referred to as the mini-pill are progestin-only OCPs. They must be taken at the same time of day, every day to be effective. The same dose is taken daily with no inactive pills. Breakthrough bleeding is a common adverse effect.

Act by thickening cervical mucus hence preventing sperm entry into the uterus. They also inhibit ovulation.

Combined Hormonal Methods

Combined hormonal methods contain a synthetic estrogen (ethinyl estradiol) and one of the many progestins. These products work by inhibiting ovulation and thickening cervical mucus. The combined estrogen/progestin drugs are found in the form of pills, a patch, or a vaginal ring. The combined hormonal methods have some medical risks, such as blood clots, that are associated with the synthetic estrogen in the product.

Combined Oral Contraceptives (COCs)

For most combination oral contraceptives, an active pill (estrogen plus progestin) is taken daily for 21 to 24 days. Then, an inactive (placebo) pill is taken daily for 4 to 7 days to allow for withdrawal bleeding. In a few formulations, the placebo pill contains iron and folate (folic acid); while in others, this pill contains a lower dose of ethinyl estradiol than the pills used during the other weeks. Combination Oral Contraceptives are also available in extended-cycle formulations (with 84 active pills, one to be taken each day, followed by 7 days of placebo pills) or as continuous-use formulations (active pills every day, with no placebo pills).

Most COCs contain 10 to 35 mcg of ethinyl estradiol. Estradiol valerate may be used instead of ethinyl estradiol. The doses of estrogen and progestin are the same throughout the month in monophasic pills or they change throughout the month in multiphasic pills.

All COCs have a similar pregnancy rate after 1 year of 0.3% with perfect use and about 9% with typical (i.e., inconsistent) use.

Contraindicated in the following conditions with increased risk of thrombosis:

- < 21 days postpartum
- Thrombogenic mutation, thrombophilia or current or past venous thromboembolism
- Active cancer excluding non-melanoma skin cancer
- Current breast cancer
- Prolonged immobility due to major surgery
- Migraine headache with aura
- Smoking in women \geq 35 years

- Hypertension that is severe (systolic ≥ 160 mm Hg or diastolic ≥ 100 mm Hg) or complicated by vascular disease
- Peri-partum cardiomyopathy < 6 months or with moderately or severely impaired cardiac function
- Ischemic heart disease or multiple risk factors for atherosclerotic cardiovascular disease
- Stroke
- Valvular heart disorders with complications
- Diabetes for > 20 years or with vascular disease (eg, neuropathy, nephropathy, retinopathy)
- Systemic lupus erythematosus with positive (or unknown) antiphospholipid antibodies
- Solid-organ transplantation with complications
- Severe (decompensated) cirrhosis, hepatocellular adenoma, or liver cancer
- Acute viral hepatitis

Contraceptive patch.

This is a thin, plastic patch that sticks to the skin and releases hormones through the skin into the bloodstream. The patch is placed on the lower abdomen, buttocks, outer arm, or upper body. A new patch is applied once a week for 3 weeks, and no patch is used on the fourth week to allow for breakthrough bleeding. Currently, Ortho Evra® is the only patch that is FDA approved.

Vaginal ring

This is thin, flexible, and approximately 2 inches in diameter. It delivers a combination of ethinyl estradiol and a progestin. The ring is inserted into the vagina, where it continually releases hormones for 3 weeks. The woman removes it for the fourth week

and reinserts a new ring 7 days later. Risks for this method of contraception are similar to those for the combined oral contraceptive pills.

Example is the NuvaRing®

2.3.4 Sterilization

Sterilization is a permanent form contraception blocks the fallopian tube or the sperm duct surgically. These procedures usually are not easily reversible. They include bilateral tubal ligation(BTL) and vasectomy.

Vasectomy

This is a sterilization of the male by blocking the vas deferens, the tube that carries sperms from the testes to the urethra during ejaculation. The vas deferens is cut, and the cut ends are tied with a suture or fulgurated. It is performed under local anesthesia. Sterility, the inability to cause pregnancy, occurs after approximately 20 ejaculations following the operation and should be documented by 2 sperm-free ejaculates, usually obtained 3 months after the operation. During this period before sterility is confirmed, a back-up contraceptive method should be used.

Mild discomfort for 2 to 3 days after the procedure is common. This can be mitigated by taking nonsteroidal anti-inflammatory drugs (NSAIDs) for pain relief and avoiding ejaculation during this period.

Complications of vasectomy include hematoma, sperm granulomas (inflammatory responses to sperm leakage), spontaneous re-anastomosis, which usually occurs shortly after the procedure. The cumulative pregnancy rate is 1.1% at 5 years after vasectomy.

Tubal Sterilization (Bilateral Tubal Ligation)

This is the surgical blockage of the female oviducts to prevent movement of ova from the ovaries to interact with sperms, thus preventing fertilization.

The fallopian tubes may be cut and a segment excised, closed by ligation, fulguration, or various mechanical devices (plastic bands or rings, spring-loaded clips) or completely removed. The use mechanical devices cause less damage to tissues and is more easily reversible than closure by ligation or fulguration. Complete excision of the fallopian tubes has been associated with a 40 to 50% reduction in the risk of ovarian cancer.

Immediate postpartum bilateral tubal ligation(BTL) has been shown to have a lower failure rate than that performed remote from delivery.

There are various methods of performing BTLs namely laparoscopically or through mini-laparotomy, hysteroscopically or during a caesarian delivery.

Complications of tubal sterilization are uncommon. They include death in 1 to 2/100,000 women, hemorrhage or intestinal injuries in about 0.5% of women. Other complications like failure of tubal occlusion occur in about 5% of women. Ectopic pregnancy occurs in about 30% of pregnancies that occur after tubal occlusion. Complications of permanent contraception by hysteroscopy may also include pelvic pain, abnormal uterine bleeding, and inflammatory disorders(WHO, 2018)(*National Family Planning Guidelines for Service Providers Ministry of Health, Division of Family Health F RMHSU, Oct 2018. Print., (2014), 2018*).

2.3.5 Long Acting Reversible Contraceptives (LARC)

Long-acting reversible contraceptives (LARCs) are contraceptives whose effects are easily reversed and do not rely on the user to maintain efficacy for an extended period of time (between 3 years and 10 years). These include intra-uterine devices (IUDs) and implants (Mehata et al., 2019). Their effects are reversible and offer the highest contraceptive efficacy (Potter et al., 2018). The rates of unintended pregnancies per 100 women with typical use are as follows; implants-0.1, Levonorgestrel IUD-0.7, Copper IUD-0.8, (WHO, 2018).

Advantages of LARC include convenience of use since only require one coming for insertion. In addition, LARC methods are cost effective, and fertility returns immediately after removal, very safe, well studied, and has few contraindications (Faculty of Sexual and Reproductive Healthcare, 2017).

2.4 IUDs

2.4.1 Types of IUDs

2.4.1.1 Copper T IUCD

This is a T shaped, polyethylene wrapped with copper wire around the stem and arms without any hormones. It acts by preventing fertilization by inhibiting sperm migration and viability. **Copper ions** are released into the uterine cavity that cause spermicidal actions. It is effective for 10 years with a failure rate of 0.8% at 1 year and 1.9% at 10 years but can be used for 10 to 12 years.

The main side effects requiring discussion with the patient regarding the copper IUD is the possibility of heavier periods, worsened **dysmenorrhea**, and longer periods by approximately 1.5 days. In this regard, the copper IUD may not be a first choice for women with a history of heavy, painful periods (Boog & Cooper, 2021).

2.4.1.2 Levonorgestrel IUD

Examples are Mirena releasing 20mcg/day, Kyleena 17.5mcg/day, Lilotta 18.6/day and Skyla 14mcg/day. These are hormonal IUDs containing the progestin levonorgestrel (LNG), which is released at an initial rate of 20 µg/day and lasts for up to 5 years.

The mechanism of action in preventing pregnancy is primarily by thickening the cervical mucus preventing sperm penetration to the upper genital tract. It also thins the endometrium which prevents implantation and finally inhibits ovulation, but not reliably.

The main side effects are irregular bleeding and/or spotting for several months following insertion. This improves over time and by 1 year, about 30% to 40% of women will have amenorrhea. In some women the amount of bleeding will be less than their normal periods(Boog & Cooper, 2021)

Duration of action is 3 years for Skyla, 4 years for Lilotta while the rest are effective for 5 years.(Barrier et al., 2015a).

Complications are not common but include uterine perforation, expulsion and method failure with pregnancy. They are MEC category 1 in uncomplicated first trimester abortions, MEC 2 in second trimester abortions and category 4 in septic abortion(Smfm et al., 2019).

2.4.2 Timing of insertion

IUDs, both hormonal and non-hormonal, can be placed immediately post evacuation or post-delivery or interval remote from birth.

If IUDs are placed postpartum, it should be within 10 minutes of delivery of the placenta or at completion of uterine evacuation in case of an abortion. Placement at this

time may be in the patient's best interest for the prevention of a rapid repeat pregnancy(Boog & Cooper, 2021).

IUDs should not be placed in cases of sepsis, molar pregnancies, suspected cancers of the genital tract like cervical cancers. They are considered MEC category 4 in these conditions(Faculty of Sexual and Reproductive Healthcare, 2017).

2.5 Contraceptive Implants

2.5.1 Types of implants

Levonorgestrel releasing implants.

Examples are Norplant, a 6 rods contraceptive implant that is rarely used currently and Jadelle, a 2 rod implant. They prevent pregnancy by preventing ovulation and thickening cervical mucus thus preventing sperm penetration(Festin, 2020).

Duration of action is 5 years releasing 40-50mcg/day at year 1 to 25-30mcg/day at the fifth year. Pregnancy rates increase after 5 years but remain below 1% (ACOG, 2017)

Etonorgestrel releasing implants

Examples include Implanon and Nexplanon. These single-rod implants are usually placed subcutaneously on the inner aspect of the non-dominant arm.

Their mode of action is mainly by inhibiting ovulation but they also cause thickening of cervical mucus preventing sperms from entering the uterus and eventually the fallopian tube hence no fertilization. Lastly these implants cause thinning the endometrial lining making it difficult to have successful implantation.

The main disadvantage is they cause changes to bleeding patterns, with irregular spotting or bleeding or amenorrhea. The bleeding patterns are unpredictable.

The Pregnancy rate is less than 1% for the first 3 years following insertion. Following removal, there is rapid return of fertility, mostly within 3 months(WHO, 2018).

Hormonal side effects are similar to the levonorgestrel releasing implants. Weight gain and worsening acne have been reported(Boog & Cooper, 2021).

Complications related to insertion include pain, bleeding, hematoma formation, deep insertion and unrecognized non insertion. At removal the implant may break or become difficult to palpate or locate requiring radiological methods to locate it (ACOG, 2017)

In the immediate post abortion period implants are Medical Eligibility Criteria 1 (MEC1) meaning they can be used without restrictions. Implant insertion can be done on the same day as the abortion, either given with the first pill of mifepristone or misoprostol in medical abortion or before surgical abortion(Barrier et al., 2015a)(Faculty of Sexual and Reproductive Healthcare, 2017). Figure 4 below shows LARC and permanent sterilization as being more effective at prevention of preventing unwanted pregnancies compared to short acting methods. This is why LARCs have been recommended for effective contraception in women who wish to postpone pregnancy.



Figure 4: World Health Organization Model of Tiered Contraceptive Effectiveness.

The figure above represents the contraceptive methods from the least effective methods to the most effective methods. LARC contraceptives have been classified as most effective methods together with permanent methods.

2.6 Prevalence of Contraceptive use in the Immediate Post-Abortion Period

2.6.1 Uptake of modern contraceptive post abortion contraceptive

Sustainable development goal (SDG) 3.7.1 focuses on the proportion of women in the reproductive age who have their need for family planning satisfied by a modern contraceptive method. The target is more than 75% in high demand regions since 100% is an unrealistic target. As at 2020, the global modern contraceptive use stood at 77% with an unmet FP need of 16%. Regionally, in sub-Saharan Africa, the modern FP use was 55% and an unmet need of 38% which is very high. Locally, in Kenya, the modern FP use was similar to that sub-Saharan Africa at 57% but the unmet FP need is low at 14%(United Nation, 2020).

The uptake of modern contraceptive methods in the immediate post abortion period varies across different regions and populations.

In Ethiopia, a study looking at the prevalence and predictors of post abortion modern contraceptive utilization following secondary analysis of their national demographic survey data, the uptake was found to be low at 25.6%. This study did not give a breakdown of the individual contraceptive methods used(Belachew et al., 2023). In 2018 in the same country, Ethiopia, a similar study was conducted in Addis Ababa by Asrat et al. The uptake of modern contraceptive methods among post abortion women was very high at 91%(Asrat et al., 2018). The first study was a nationally representative data while the second study was hospital based.

In northern Tanzania, a study looking at the predictors and barriers of post abortion modern contraceptives, found the uptake to be low at 31.2% (Asubiojo et al., 2021). Similarly, in a Rwandan study of 2019 that was looking at voluntary uptake of post abortion modern contraceptives among women who received misoprostol for up to one-month post abortion. The uptake before discharge from the hospital was low at 47%. This value improved to 71% after one month. This was due to follow-up counselling(Packer et al., 2019).

Similarly, in an interventional study carried out by Marie Stopes in Kenya aimed at improving private sector provision of post abortion contraceptives, both the baseline and post intervention uptake of modern contraceptives were lower than the current study findings at 19.3% and 30.79% respectively (Footman et al, 2017).

In a similar study carried out in urban Guinea in 2019 assessing the uptake of modern FP among women seeking post abortion care services, the modern contraceptive uptake was very high at 91.1%. This may be explained by the fact that majority of the participants had had an induced abortion and desired to delay subsequent pregnancy(Mina Millimouno et al., 2019).

Locally, in Kisumu, Kenya, a study looking at secondary outcomes of a randomized controlled trial (RCT) looking at contraceptive uptake in PAC seeking clients, the modern contraceptive uptake was high at 76%. Most of the clients preferred short acting methods as opposed to LARC(Makenzius et al., 2018). In another interventional study conducted in south western Kenya involving 80 facilities, both public and private, prioritizing training and mentorship providers on both medical and surgical abortion care, post-abortion contraception and youth friendly services. The immediate modern contraceptive uptake was 85% with a majority choosing long-acting reversible

contraception(Mbehero et al., 2022). This points to some of the factors that improve uptake of post abortion contraceptives.

2.6.2 Uptake of post abortion LARC

Despite LARCs high efficacy and safety, its use among women of reproductive age remains generally low. According to statistics on contraceptive prevalence by the United Nations 2019, the global IUD and Implants rates were low at 8.4% and 1.2% respectively. In Sub Saharan Africa the general IUD use was worse at 0.7% and implants 4.5%. In Kenya the general IUD prevalence was 0.8 and implants were at 14.9%. Injectable contraceptives were the most commonly used at 19% (“Contracept. Use by Method 2019,” 2019).

Janie Benson et al, in a multi-country study involving 10 countries in Asia and Sub-Saharan Africa, assessing the factors contributing to post abortion contraceptives by young women found a 77% modern contraceptive uptake in the immediate post abortion period. The uptake of LARC before leaving the hospital was 16%(Benson et al., 2017).

In a study conducted in Nepal where 20,307 women aged 24 years and younger seeking abortion services, 79% accepted a modern method of contraception. Short-acting contraceptive methods were the most preferred (68%) followed by LARC methods (11%) then permanent methods (0.4%) (Mehata et al., 2019).

In the Ethiopian study carried out in a hospital in Addis Ababa, the post abortion LARC uptake was 19% against a modern contraceptive uptake of 91%. This still demonstrates preference of short acting contraceptive methods over the more effective LARCs (Asrat et al., 2018). In contrast, a study in urban Guinea found a post abortion modern

contraceptive uptake of 91.1% with a LARC uptake of 34.7% for IUDs and 28.5% for implants. The LARC uptake was very high at 63.2% (Mina Millimouno et al., 2019).

In a United Kingdom study assessing uptake of post abortion LARC following a telemedicine delivered abortion care during the COVID 19 pandemic, the uptake was very low at 16%. This was thought to be due to the fact that the clients were not in the hospital thereby necessitating an appointment to receive the LARC method (Dixon et al., 2022).

In Kenya, in a study conducted in Kakamega with 423 respondents, looking at the general contraceptive uptake among women seeking FP services, only 20.6% utilized LARC methods (Ontiri et al., 2019). The trend is similar to a study conducted in Kisumu where 7.4% of the participants chose implants while only 1.3% chose IUDs (Makenzius et al., 2018). This prevalence is similar to the national and global prevalence with LARC being the lowest despite its superior efficacy in prevention of pregnancy.

2.7 Factors Associated with Uptake of LARC

2.7.1 Drivers of LARC Uptake

Several studies have tried investigating the factors that positively influence uptake of LARC. This section looks at these factors in depth.

In a study involving 10 countries in Asia and sub-Saharan Africa assessing factors associated with post abortion family planning acceptance found the following factors. Clients who received abortion care in a public facility were more likely to take up LARC compared to those who went to a private facility. Still on type of facilities, those who were served in a primary facility were more likely to take up contraceptives compared to those in secondary or tertiary facilities. Age above 25 years was associated

with a higher likelihood of LARC uptake as opposed those below 25 years. Those who sought an induced abortion compared with those who sought post abortion care were more likely to take up a LARC method. Having a surgical evacuation was also associated with an increased likelihood of LARC uptake compared to those who had medical abortion. Lastly, those who had a first trimester abortions were found to be more likely to use LARC compared to those with second trimester abortions(Benson et al., 2017).

In China where the uptake of LARC is generally high, Luo et al found the following factors to be predictors of LARC uptake; women who had previously used a LARC method were more likely to use LARC again. Those who were married were also found to have a higher likelihood of utilizing LARC contraceptive. This may be related to the higher frequency of sex, which was found to be an independent predictor of utilization of implants and IUDs. On the other hand, low parity, being single and desired pregnancy as soon as possible were negative predictors or barriers of LARC uptake (Luo et al., 2018).

Qureshi et al in a study conducted in East and Southern Africa involving Kenya, Malawi, Mozambique and Uganda, Multi-parity and contraceptive counselling were found to increase the odds of LARC uptake as opposed to urban dwelling that is associated with less odds of utilization of LARC(Qureshi et al., 2022).

In an Eastern Africa systematic review and meta-analysis of 29 cross-sectional studies, receiving contraceptive counselling, having a history of prior abortion, multi-parity and being married were associated with higher odds of LARC uptake post abortion(Bizuneh & Azeze, 2021b).

In Ethiopia, in Harar City, religion, ethnicity, educational status and occupation of woman were significantly associated with utilization of long acting reversible contraceptive. House wives were more likely to use LARC compared to daily laborers. As concerns educational status, those without education were found to be more likely to utilize LARC in comparison with those who were educated(Kasiye Shiferaw,&, 2017). In another Ethiopian study in Addis Ababa by Asrat et al, being a housewife, being married and a parity greater than 1 were significant associations for uptake of modern contraceptives following an abortion. Being a student, parity greater than 1, and having an induced abortion were the factors that were significantly associated with LARC uptake(Asrat et al., 2018). Despite these 2 studies being in the same country, the factors associated with LARC uptake were different for each of them.

In urban Guinea, age, married marital status, history of pregnancy in the past, history of an abortion and, desire to postpone pregnancy for next 12 months were found to be significantly associated with increased LARC uptake. However, on multivariate analysis, having a history of an abortion and desire to postpone pregnancy remained significant(Mina Millimouno et al., 2019).

In Tanzania, being married and partner support for contraception were the factors found to be positively associated with LARC uptake(Asubiojo et al., 2021). Similarly, in a Ghanaian study, marital status was found to be a significant predictor of uptake of contraceptives. The other factors were residing in the rural areas, receiving counselling on contraceptives from a healthcare worker and age with those above 35 years being less likely to use contraceptives(Kayi et al., 2021).

In Northern Uganda, while assessing factors influencing LARC uptake among female sex workers, longer duration of sex work, higher parity, history of unintended pregnancy during sex work and being a lodge based sex worker were all associated with

increased odds of use of post abortion LARC(Ouma et al., 2022). Similarly, Atuhairwe et al in a cross-sectional study across 14 public hospitals, found higher parity more than 5 and receiving family planning counselling increase odds of LARC uptake post abortion. On the other hand, religion specifically being a Muslim reduced the odds of using LARC. The others were planned pregnancies and spousal awareness of pregnancy(Atuhairwe et al., 2023).

In Kenya, Ontiri et al in Kakamega, while looking at the general LARC uptake not related to abortion, wanting no more children was the most significant associated factor with LARC uptake. Others were tertiary education which increased the odds of LARC utilization compared to participants with lower levels of education. Lastly, being protestant was associated with reduced odds of use of LARC compared to Catholics (Ontiri et al., 2019). Makenzius et al in Kisumu while assessing post abortion LARC uptake found multi-parity, being married and being accompanied by partner were associated with increased LARC uptake (Makenzius et al., 2018).

A project based research in South Western Kenya geared towards facilitating post abortion contraception for young people reported improved uptake of LARC from several interventions. Improved health facility infrastructure and improved commodities supply to ensure no stock-outs. The health care providers both in public facilities received comprehensive training and mentorship on contraceptive counselling and provision of LARC until they were confident to provide LARC and high quality abortion services. There was community involvement to reduce stigma surrounding abortion services. Myths, misconception and misinformation were corrected. Community health volunteers were involved to identify cases and give appropriate referrals. All these multipronged interventions led increased LARC uptake to 90% in those below 24 years(Mbehero et al., 2022).

2.7.2 Barriers to LARC uptake

Despite the documented safety and efficacy of LARC as post abortion contraceptives, there are various documented barriers to its use. These barriers can be broadly classified into client related, health system and policy related barriers. Additionally, there are social, cultural, religious, policy, and legal restrictions that affect both the practice of abortion and contraceptive use which continue to create barriers to effective care.

Women's lack of knowledge about contraceptive methods, limited availability of contraceptive commodities in the abortion care setting, lack of administrative coordination between abortion care and contraceptive services, inadequately trained providers, and dwindling resources are some of the obstacles to effective post abortion contraception (Barrier et al., 2015b). These are mainly health system related barriers. In contrast to these findings, Baker et al in their study addressing the silent pandemic of unintended pregnancies and abortions, opine that these barriers have been overshadowed by client related barriers. They pointed out that lack of awareness, and lack of access to contraception are no longer leading causes of contraceptive non-use. Instead, they believe these barriers are overshadowed by concerns over future fertility, contraceptive side effects, myths, stigma and opposition from self and others (Baker et al., 2022). This calls for a shift in strategies in order to improve uptake of post abortion family planning.

A Chinese study by Luo et al assessed the predictors and barriers to post abortion LARC. The identified barriers included low parity, being single, and desire for pregnancy soon following an abortion. The other barriers were anxiety about possibility of impaired future fertility expressed by 56.2% of the participants, belief that LARC are harmful to their health (45.2%), irregular bleeding and risk of IUD failure were the

other reasons for non-use of LARC. 36.1% of the study participants were not aware of the availability of LARC hence they would not choose it(Luo et al., 2018).

Mackenzius et al also found similar barriers as found in the earlier mentioned studies like fear of side effects, concerns about future fertility, partner refusal, planned pregnancy in the near future and lack of contraceptive supplies(Mackenzius et al., 2018). Socio-cultural factors, lack of women empowerment to make contraceptive choices, low community demand, and lack of familiarity with contraceptive method (Barrier et al., 2015b) (Kasiye Shiferaw,&, 2017) have also been associated with low uptake of post abortion LARC.

In Uganda, client perceptions were negatively influenced by myths and misinformation, fear of side effects, lived experiences and healthcare providers' lack of information and skills. They recommended the need to provide accurate and correct information concerning the use of LARC methods to both potential users and healthcare providers to dispel myths and misinformation that act as barriers to the uptake of LARC.(Kakaire et al., 2014).

In a mixed methods study in Tanzania the following were the barriers identified during the focused group discussion with women who had received post abortion care and with healthcare providers. Misinformation and misconception about modern contraceptives with some participants reporting they caused their current miscarriage. Lack of knowledge of the available contraceptive methods which limited the participants' choice of contraceptive methods. Fear of side effects like nausea, weight gain or loss, prolonged menses, swollen legs and infertility were reported to be the major barriers to uptake of post-abortion family planning. Lack of adequate and comprehensive family planning information from the Health care providers did not empower the participants to use contraceptives. The health care providers in the in depth interviews

acknowledged their poor counselling skills as a barrier to post-abortion family planning uptake. There was also poor coordination of post abortion services within each visited facility leading to women leaving the facility without family planning counselling and/or contraceptives provision(Asubiojo et al., 2021).

In western Kenya, Ontiri et al, while looking at LARC uptake among women seeking family planning services in rural facilities, identified the following barriers from interviews with health care providers. Lack of adequate skills to provide LARC methods and poor contraceptive counselling skills. Staff shortage which forced the staff to cover several service points in the hospital made it easier for providers to have a bias towards short acting contraceptives that are easy to administer. Lastly, lack of spousal support of contraception making it difficult for women to accept contraceptives(Ontiri et al., 2019).

In Kilifi county a study on why young people do not take up contraceptives after receiving PAC services, where in-depth interviews with these young women were conducted. Findings revealed that post-abortion contraceptive counselling and methods were not always offered to patients as prescribed in the PAC guidelines. When contraceptive counselling was offered, certain barriers affected uptake of the methods. These barriers included inadequate contraceptive information, coercion by providers and partners on which methods to use or not to use, and fears of side effects(Mwadhi et al., 2023)ⁱ.

Health system barriers including limited availability of services, supplies and human resource capacity and skills and low quality of contraceptive counseling. Interventional research addressing these issues by providing training and mentorship have been shown

to significantly improve LARC uptake (Wendot et al., 2018) (Mbehero et al., 2022)(Kakaire et al., 2014).

Policy-related barriers like resource constraints, policy and legal restrictions, lack of motivation and incentives to health workers, inadequate focus on youth and their sexuality, and post-abortion contraceptive use (Kakaire et al., 2014)(Mbehero et al., 2022).

2.8 Barriers to IUD uptake

There are specific barriers to the use of IUCD that make its uptake very low in comparison with implants. The next section looks at these barriers in depth.

2.8.1 Provider barriers

These include provider beliefs that IUDs cause diseases and conditions like pelvic inflammatory disease, endometrial cancer, ectopic pregnancies intra-abdominal and bladder injuries. These beliefs prevent the providers from offering IUDs to potential clients. Hormone releasing IUDs have a protective effect on the development of endometrial and cervical cancer. (Goldstuck, 2014).

Strict timing for insertion of an IUD (during or shortly after menstruation to rule out pregnancy and ease of insertion since the cervix is open) would create missed opportunities for clients who come at any other time during their cycle. There is evidence that insertions performed mid-cycle give better results since the uterine fundal muscle is quiescent at this time and the uterine cavity is larger and more receptive to the IUD (Ontiri et al., 2019).

Nulli-parity, lactation and previous cesarean section are thought to be grounds for delaying IUD insertion. Insertions in this group should be performed with caution because the chance of perforation is greater. Potential acceptors should receive their

IUD at the time of presentation wherever possible and not be asked to return for fitting.(Goldstuck, 2014)(Kasiye Shiferaw,&, 2017)

2.8.2 Client related barriers

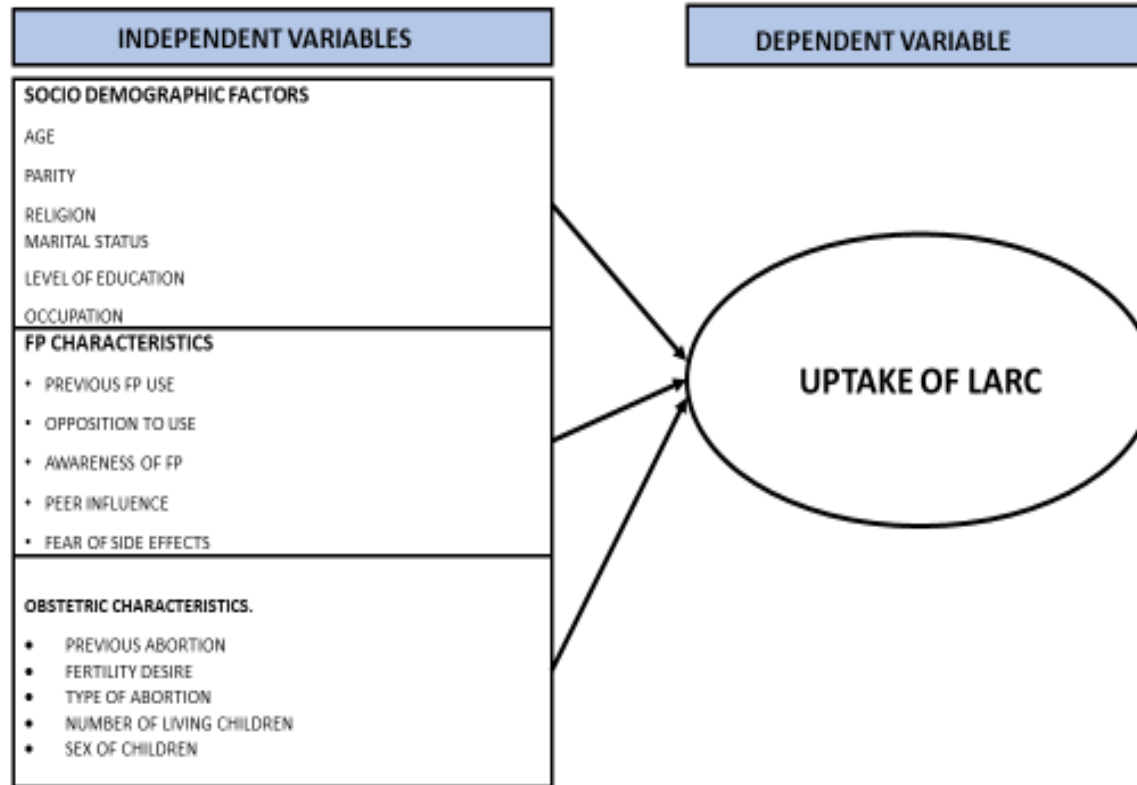
Women fear the prospect of insertion and subsequent pain, bleeding and /or discomfort with the IUD. In women of low parity, the most significant cause of pain is the diameter of the IUD inserter tube or its presenting surface area. The newer IUDs are smaller and cause less stretching of the cervical canal leading to less discomfort. (Goldstuck, 2014). Other barriers include worry about future fertility, fear of harm to health , irregular bleeding or spotting, IUD-related reproductive tract infections, displacement, or loss of the device, lack of awareness about LARC, and fear that the process of insertion and removal of IUDs is tedious (Luo et al., 2018).

In an interventional study conducted in Nairobi amongst the slum populations in order to increase uptake of LARC. The reasons for low uptake of LARCs included misperceptions about their safety and efficacy, perceived lack of consumer demand, inadequately trained providers, and the relative complexity of providing LARCs in a set up complicated by staff shortage(Muthamia et al., 2016).

In a study conducted in Kakamega, health system challenges like staff shortage, inadequate skills, inadequate counseling, and inadequate infrastructure, were cited as main barriers to provision of LARC methods. Provider bias towards short term contraceptives due to the longer time taken to counsel and insert an IUD. This underscores the need to intensify mentorship of health care workers to appreciate the long term benefits that LARC confers on clients and on themselves.(Ontiri et al., 2019).

This study however, focuses on the patient/client related factors that may influence post-abortion LARC uptake only.

CONCEPTUAL FRAMEWORK



CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Design: Cross sectional analytical study design was used.

3.2 Study Area: The study was conducted in the Faraja (Gynecology) ward of the Moi Teaching and Referral Hospital (MTRH), in Eldoret. This is where clients seeking abortion services are attended to. MTRH is Kenya's second national teaching and referral hospital and is located in the town of Eldoret, Uasin Gishu County in the North Rift Area of Western Kenya with a catchment population of approximately 24 million people. Currently MTRH has a bed capacity of 1024 which includes 40 beds in Faraja ward. Faraja ward has a bed occupancy level of 115% with an average monthly admission of 229 patients, 45% (about 103) of these are due to abortions with its related complications.

3.3 Study population: All women who received abortion services in Faraja ward of MTRH between 1st August 2021 and 28th July 2022.

3.4 Sample size calculation

To determine the minimum sample size needed to identify associations of LARC uptake among women in the immediate post abortion period on multiple logistic regression, Peduzzi's formula (Peduzzi et al.,1996) was used:

$$n = \frac{10k}{p}$$

Where

n is the minimum sample size

k=7 is the number factors to be considered

p=16% LARC uptake among post-abortion women in Sub-Saharan Africa by Janie Benson, (2017). Substituting for the above figures and adjusting for 20% non-response rate the sample size was **526**.

The respondents were selected using systematic random sampling using the admission register at Faraja ward. Using an average of 103 abortion related admissions per month, multiplied by 12 months of a year then divided by the sample size to get the sampling interval. $(103*12)/526=3$. The first client was selected randomly then every third client in the register meeting the eligibility criteria and willing to participate in the study was interviewed. In case a client declined to participate, the next participant on the list was selected as replacement. The procedure was repeated for each day of data collection until the desired sample size was achieved.

3.5 Eligibility criteria:

3.5.1 Inclusion criteria: Women in the immediate post abortion period receiving care at Faraja ward.

3.5.2 Exclusion criteria:

Patients meeting the inclusion criteria but with the following:

- Women with a diagnosis of post abortion sepsis
- Very sick patients with life threatening complications or maternal near miss criteria
- Suspected molar pregnancy

3.6 Data collection

This was achieved through the use of a structured interviewer administered questionnaire. Before the recruitment of study participants, a two-day training was offered to the research assistants (2 clinical officers and 2 nurses not working in the unit). The training covered the eligibility criteria and how to identify the study participants. The assistants were also trained on insertion of the IUDs, contraceptive

implants and administration of other contraceptive methods. The nurse in charge of the Faraja ward was informed about the study and its purpose was explained.

The selected study participants identified were approached by either the principal investigator or a trained research assistant. The aim of the study was explained using a language well understood by the respondent. Verbal consent to participate in the study was sought. Once given, the client was directed to a private room where an informed written consent for adults or assent with parental consent was taken for those below 18 years. Following the written consent, the study questionnaire was administered. Contraceptive counselling was offered. The clients were taken through all the available contraceptive methods, highlighting their benefits, side effects, failure rates, and the medical conditions in which they are used with caution. The client was then allowed to choose their preferred contraceptive method. More information on the chosen method would then be shared including when they become effective, any follow-up required and any concerns from the client were addressed. The client was asked to give reasons for their choice or the reason for not choosing a LARC method.

The chosen method was then administered by the principal investigator or a trained research assistant, either a nurse or clinical officer. Those who opted not to have any contraceptives were asked for their reasons and asked to visit any facility offering contraceptives whenever they were ready.

The principal investigator's telephone number was given to the client to use to notify her of any adverse reactions.

Participant recruitment Flow Chart

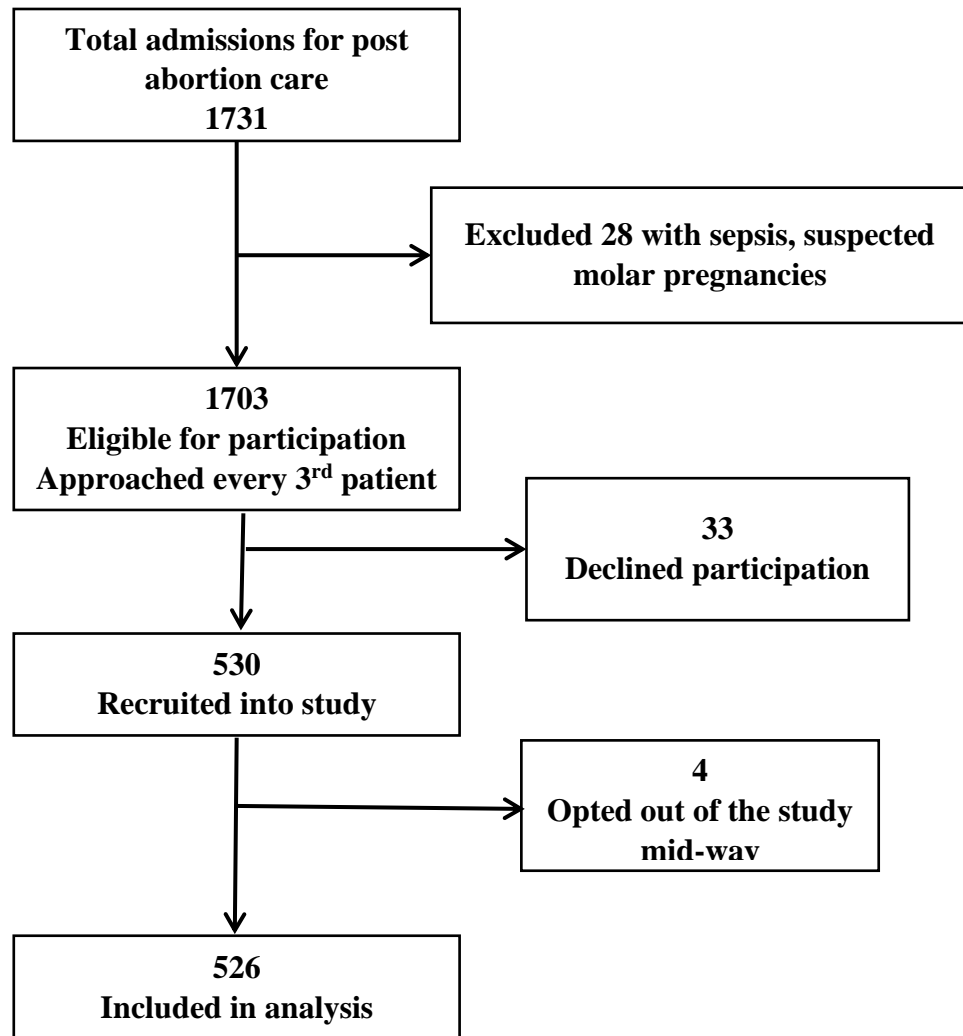


Figure 6: Participant recruitment Flow Chart

3.7: Validity of research instruments

The data collection tool was a researcher developed interviewer questionnaire. To enhance its validity, a pilot test was carried out using the questionnaires on 50 women (10% of sample size) in the immediate post abortion period at Bungoma county referral hospital. The domain of indicators which were relevant to the topic were used while those that were not useful were expunged from the questionnaire.

3.8 Data management and analysis

Data collected using questionnaires was checked for completeness and errors on a daily basis by the researcher before being entered into an electronic database created using Microsoft Access. The entered data was de-identified and encrypted with a password to ensure confidentiality was maintained at all levels. The questionnaires were kept in a safe cabinet under a lock and key that was kept by the researcher. The electronic databases were backed up and kept in separate safe locations to cushion against data loss.

The data was imported into STATA version 16 where coding, manipulation and data analysis was done. Categorical variables such marital status, occupation and level of education were summarized as percentages and frequencies. Continuous variables such age were summarized as means and standard deviations if they assumed a Gaussian distribution otherwise they were summarized as median and interquartile range.

All statistical tests were performed at 95% confidence level with statistical significance at P values less than 0.05. The table below summarizes how data analysis was done per the study objectives.

Table 1: Data Analysis Plan

Objectives	Outcome	Independent	Test
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To determine the proportion of women in the immediate post abortion period who would choose a modern contraceptive.	Contraceptive uptake Binary Categorical	-		Proportion and frequency
To determine the proportion of women who would choose LARC (IUCD and Implants) in the immediate post abortion period	LARC uptake Binary Categorical	- -		Proportion and frequency
To identify factors associated with uptake of LARC among women in the immediate post-abortion period at MTRH	LARC uptake Binary Categorical	-	Age – Discrete Marital status – Nominal Education status – Nominal Parity - Nominal Occupation - Nominal Fear of side effects - Binary Provider gender - Binary Categorical Income - Nominal	T test – to compare discrete and binary categorical Chi square and fishers exact – to compare categorical data Binary logistic regression model – to fit drivers/barriers of LARC uptake

3.9 Measurable Variables

The **dependent** variable was the long acting reversible contraceptive method chosen.

The **independent** variables were the age, parity, desired family size, level of education, religion, marital status, knowledge of contraception, woman’s approval of FP, spouse’s approval of FP, fear of side effects, provider’s attitude and client’s intention to use LARC.

3.10 Data quality control

1. The research assistants were trained.
2. The questionnaire was pretested.
3. Regular meetings were held with the research assistants to sort out any challenges encountered during data collection.

3.11 Ethical considerations

The study approval was sought from the IREC and MTRH.

Informed written consent/ assent was obtained from the study participants.

The data obtained from the participant was kept confidential.

The participants were free to opt out of the study without jeopardizing their further treatment at the unit.

3.12 Dissemination

The study findings will be prepared in a thesis that will be presented to Moi University in partial fulfillment for the award of degree in masters of Medicine-Reproductive Health.

The results and recommendations will be shared with the Directorate of Reproductive Health of MTRH to improve service delivery in the unit.

An abstract will also be written and presented at Kenya Obstetrics and gynecological society conference and published in peer-reviewed journals such as East African medical journals online.

FINDINGS

4.0 INTRODUCTION

These findings are based on 526 women who received post abortion care services in Faraja ward of MTRH between 1st August 2021 and 28th July 2022 with the aim of determining the proportion of women in the immediate post abortion period who would choose LARC and the factors that influence their choice.

4.1 Sociodemographic Characteristics

The average age of participants was 27.6 ± 7.1 years ranging from 15 to 46 years. Protestants formed the majority of participants (81%) in terms of religious affiliations. Over half (55.1%) of the participants were married, while the rest were either single, divorced or widowed. Almost half of the participants had attained secondary level of education at 48.5%, with 33.5% having attained tertiary level of education. As pertains gainful employment, only 17.3% were salaried employees. Majority (67.8%) were either casual employees (30.8%) or self-employed at 39.5%. Those who had no gainful employment were 12.4% as shown in Table 2 below.

Table 2: Socio-demographic characteristics

Variable	Category	Frequency	Percentage
Age	Mean(mSD)	27.6 (7.1)	
	Range	15 – 46	
Age group	15-19	40	7.6
	20-29	291	55.3
	30-39	148	28.1
	>39	46	8.7
Religion	Protestant	426	81.0
	Catholic	96	18.3
	Islam	4	0.8
Marital status	Married	290	55.1
	Not Married	236	44.9
Education level	Primary	95	18.1
	Secondary	255	48.5
	Tertiary	176	33.5
Main source of income (Occupation)	Casual employment	162	30.8
	Self employed	208	39.5
	Salaried employment	91	17.3

None	65	12.4
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4.2 Obstetric Characteristics

Majority of the participants had between one and four children with (69.3%) while only 10.5% having five children and more.

Majority (93.9%) of participants had had one or two miscarriages, with 6.1% having three or more miscarriages. One participant had had seven (7) miscarriages.

The number of desired children ranged from 1 to 10 children with 110(20.9%) not being sure of the number of children they desired to have. However, majority of the participants desired four children (34.2%).

Most respondents intended to have their next child after a 2 year break 200(38.0%), while 117(22.2%) did not plan to ever have another child.

Majority 319(60.7%) of the participants reported the current pregnancy as unplanned.

As concerns the type of abortion, 64.6% of the pregnancies were lost spontaneously while 35.4% were reported as induced.

Table 3: Obstetric Characteristics

Variable	Category	Frequency	Percentage
Parity	0	106	20.2
	1-4	365	69.3
	>4	55	10.5
Abortions	1-2	494	93.9
	>2	32	6.1
Living children			
Boys	0	179	34.0
	1-2	274	52.1
	>2	73	13.9
Girls	0	228	43.2
	1-2	247	47.0
	>2	51	9.8
Number of desired children	1-4	305	58.0
	>4	111	21.2
	Not sure	110	20.9
Timing of next delivery	< One year	125	23.8
	2 years	84	16.0
	> 2 years	200	38.0
	Never	117	22.2
Planned pregnancy	Yes	207	39.3
	No	319	60.7
Type of abortion	Spontaneous	339	64.6
	Induced	186	35.4

4.3 Family Planning Awareness and Utilization

General contraceptive awareness (having heard or knowing about any contraceptive method) was impressive at 96.4% amongst the respondents. The most commonly mentioned family planning method was injection (Depo) at 467(88.9%) followed by pills (81.6%), emergency pills (74.7%) and implants 71.73%. The least mentioned methods include herbs (0.8%) patch (1.1%) and diaphragm (1.7%).

Majority 422(80.2%) of study participants had heard of implants and coil as family planning methods. 76.2% knew where to find these LARC methods while the rest mentioned wrong places namely chemists and community health workers. However, 81(15.4%) of participants did not know where implants and coils could be found.

Concerning previous LARC use about half (56.3%) of the participants had used LARC before with a similar number (53.2%) reporting ever receiving information on how these methods work.

The most frequently mentioned barrier to LARC use was side effects at 53.0%. Lack of awareness (23.9%) opposition to use (18.1%) and inaccessibility (10.6%) were also mentioned.

In terms of factors that promote use of implants and coils, the fact that they offer long term contraception was the most frequently mentioned at 55.5%, followed by previous use of implants and coils (15.2%). These are presented in table 4 below.

Table 4: Family planning awareness

Variable	Category	Frequency	Percentage
FP Awareness	Yes	507	96.4
	No	19	3.6
FP Methods mentioned	Pills	429	81.6
	Injection	467	88.9
	Emergency pill	393	74.7
	Coil	321	61.1
	BTL	196	37.3
	Vasectomy	46	8.7
	Condoms	209	39.7
	Diaphragm	9	1.7
	Patch	6	1.1
	Withdrawal	133	25.3
	Calendar method	191	36.3
	Implants	377	71.7
	Herbs	4	0.8
Awareness of LARC	Yes	422	80.2
	No	104	19.8
Know where to find LARC	Health facility	401	76.2
	Community health workers	36	6.8
	Pharmacy/ chemist	25	4.8
	Don't know	81	15.4
Previous Use of LARC	Yes	296	56.3
	No	230	43.7
Barriers to LARC use	Lack of awareness	126	23.9
	Not available	56	10.6
	Opposition to use	95	18.1
	Side effects	279	53.0
Drivers of LARC use	Offers long term FP	292	55.5
	Peer influence	64	12.2
	Accessibility	77	14.6
	Previous use	79	15.0

4.4 Proportion of Women in the Immediate Post Abortion Period Who Chose a Modern Contraceptive Method (Modern contraceptive uptake).

The proportion of women who took a modern contraceptive method before leaving the hospital was **54.9%**. The modern contraceptives methods taken up included the following in descending order: Injections 16%, Pills 15.6%, Implants 15.2%, IUCD 4%, Condoms 3% and Bilateral tubal ligation at 1.1%.

Almost half of the participants declined use of any contraceptive before leaving the hospital as shown in figure below.

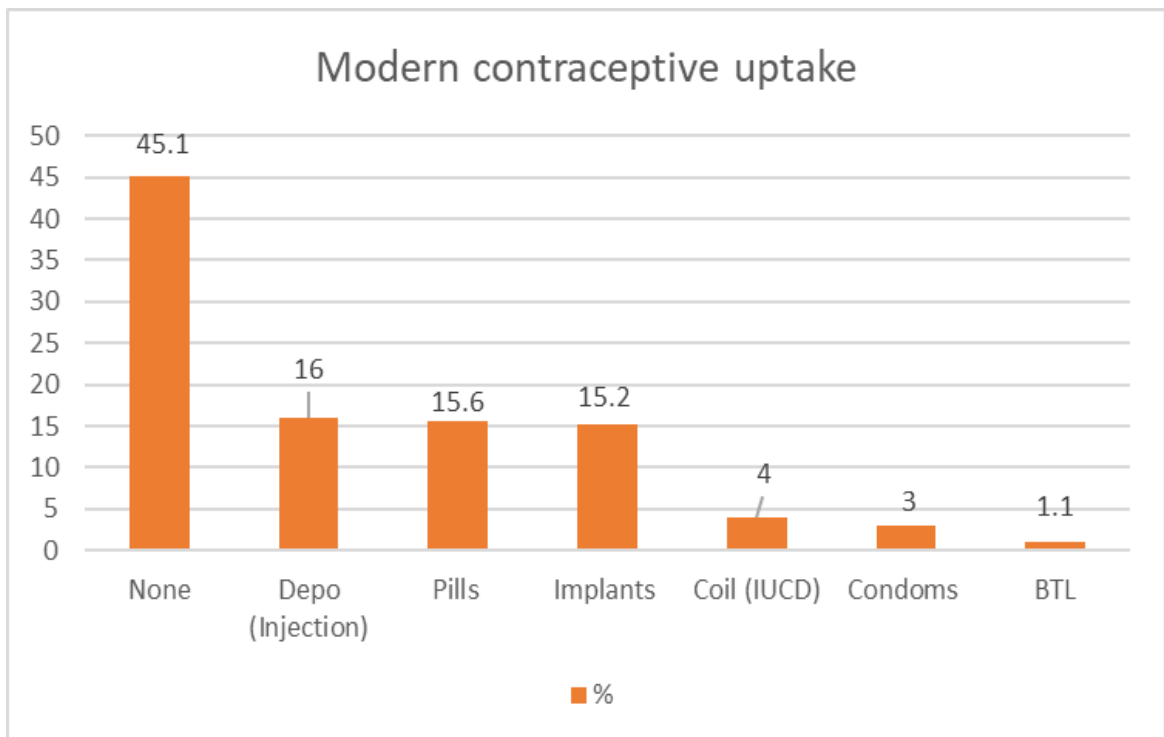


Figure 7: Modern contraceptive uptake

4.5 Proportion of Women Who Chose LARC (IUCD and Implants) in the Immediate Post Abortion Period

The proportion of women who used LARC (IUCD and Implants) before leaving the hospital was **19.2%** [95% CI: 15.9% - 22.6%]. 4% of all the participants chose IUCD while 15% took up implants.

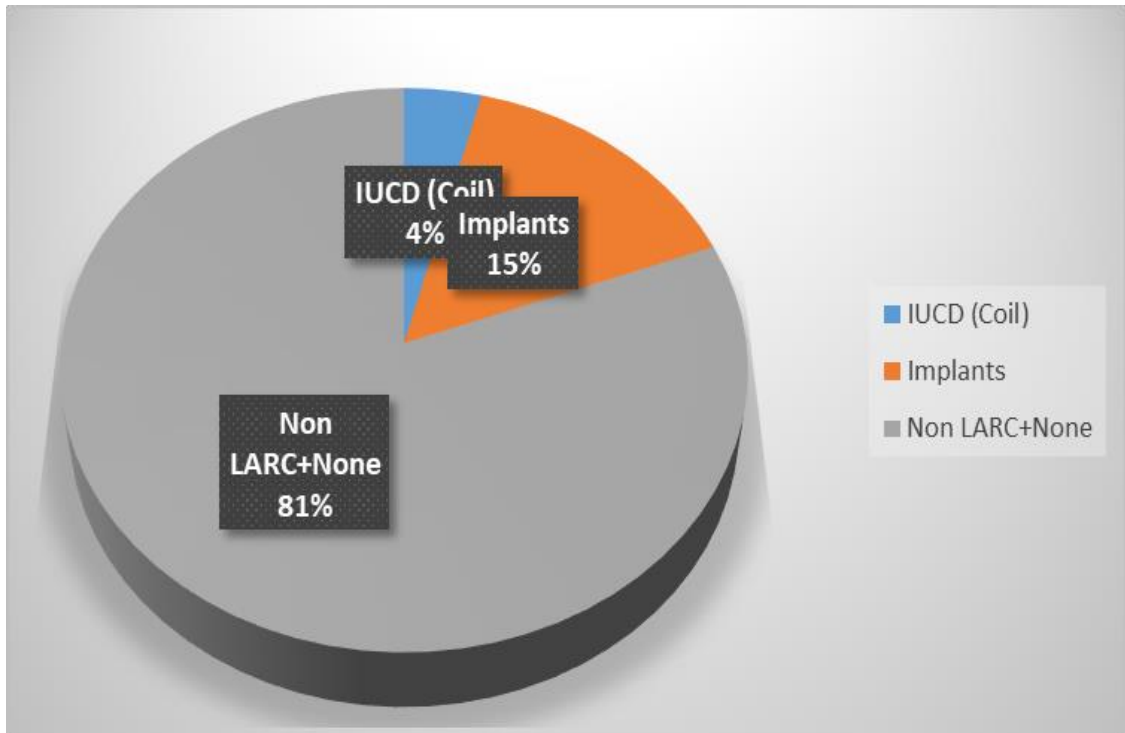


Figure 8: Immediate Post Abortion LARC Uptake

4.6 Factors Associated with LARC Uptake among Women in the Immediate Post Abortion Period

4.6.1 Association between LARC uptake and sociodemographic characteristics

On average those who chose LARC were slightly younger (26.6 ± 6.6 years) compared to those did not choose LARC (27.9 ± 7.2 years) though the difference mean age was not statistically significant ($p=0.098$).

On education level and LARC uptake, those with an education were 4 times more likely to use LARC compared to those with no education, although this was not statistically significant. Only one woman who had no formal education chose LARC compared to 20%, 19.6%, and 19.3% among those who had primary, secondary and tertiary education level respectively.

The proportion of those who chose LARC was slightly lower among the married (17.6%) compared to 20.8% among those who were separated, single or divorced. There was no statistically significant association.

Amongst those who did not work outside their homes (with no occupation), there was an almost 2 times likelihood of LARC use compared to those with an occupation. {uOR1.77 CI (1.08-2.89) P=0.022}.

In terms of religion, Protestants and Catholics were less likely to take up a LARC method in comparison to the other religions who had a 2.18 unadjusted odds of LARC uptake, though not statistically significant.

Marital status was not found to be significantly associated with uptake of LARC ($p>0.05$) as shown in table 6 below.

Table 5: Association between LARC uptake and Sociodemographic characteristics

Variable	Category	LARC uptake		uOR	CI	p-value
		No(%)	Yes(%)			
Age	Mean (SD)	27.9 (7.2)	26.6 (6.6)	0.97	0.94-1.01	0.099
Education level	None	19 (95%)	1 (5%)	1		
	Primary	60 (80%)	15 (20%)	4.75	0.59-38.36	0.144
	Secondary	205 (80.4%)	50 (19.6%)	4.63	0.61-35.44	0.140
	Tertiary	142 (80.7%)	34 (19.3%)	4.55	0.59-35.18	0.147
Religion	Protestant	345 (81.48%)	79 (18.6%)	1		
	Catholic	77 (88.2%)	19 (19.8%)	1.08	0.62-1.88	0.793
	Others	3(60%)	2 (40%)	2.18	0.39-12.13	0.372
Marital status	Married	239 (82.4%)	51 (17.6%)	1		
	Single/separated/ widowed/divorced	187 (79.2%)	49 (20.8%)	1.23	0.79-1.90	0.356
Outside work apart from housework	Yes	343 (83.1%)	70 (16.9%)	1.77	1.08-2.89	0.022
	No	83 (73.4%)	30 (26.6%)	1		
Main source of Income	Casual employment	134(82.7%)	28(17.3%)	1		
	Self-employment	170(81.7%)	38(18.3%)	1.07	0.62-1.83	0.806
	Salaried employment	75(82.4%)	16(17.6%)	1.02	0.52-2.01	0.952
	None	47(72.3%)	18(27.7%)	1.83	0.93-3.61	0.080

4.6.2 Association between LARC Uptake and Obstetric Characteristics

Women who desired their next pregnancy after 2 years were 5 times likely to take up LARC compared to those who desired pregnancy in less than 2 years with uOR 5.04 CI (2.44-10.41) P=<0.001.

As concerns gender of living children, those who had both boys and girls were twice more likely to take up LARC post abortion with a crude odds ratio of 2.26 CI (1.02-5.03) P=0.045.

There was no association between LARC uptake and number of desired children, type of abortion, number of living children and number of abortions (>0.05). However,

women with more than 4 children (higher parity) were less likely to utilize LARC than those with a lower parity though not statistically significant. uOR 0.43 CI (0.15-1.22) P=0.112.

There was a slightly higher likelihood of LARC uptake among women who reported an unplanned pregnancy than those had planned the pregnancy though not statistically significant as shown in table 6 below.

Table 6: Association between LARC Uptake and Obstetric Characteristics

Characteristics	LARC uptake		uOR		p-value
	No(%)	Yes(%)			
Parity					
0	86 (81.1%)	20 (18.9%)	1		
1-4	290 (79.5%)	75 (20.5%)	1.11	0.64-1.93	0.704
>4	50 (90.9%)	5 (9.1%)	0.43	0.15-1.22	0.112
Children gender					
None	86 (81.1%)	20 (18.9%)	1.89	0.78-4.56	0.157
Boys	99 (81.1%)	23 (18.9%)	1.89	0.80-4.48	0.149
Girls	65 (89.0%)	8 (11.0%)	1		
Both	176 (78.2%)	49 (21.8%)	2.26	1.02-5.03	0.045
Abortion					
1-2	393 (80.7%)	94 (19.3%)	1.29	0.48-3.44	0.609
>2	27 (84.4%)	5 (15.6%)	1		
Number children desired					
0-4	239 (78.4%)	66 (21.6%)	1.53	0.85-2.74	0.155
>4	94 (84.7%)	17 (15.3%)	1		
Not sure	93 (84.5%)	17 (15.5%)	1.01	0.49-2.10	0.977
Next pregnancy					
Less than 1 year	112 (89.6%)	13 (10.4%)	1		
2 years	53 (63.1%)	31 (36.9%)	5.04	2.44-10.41	<0.001
More than 2 years	163 (81.5%)	37 (18.5%)	1.96	0.99-3.85	0.052
Never	98 (83.8%)	19 (16.2%)	1.67	0.78-3.56	0.183
Planned pregnancy					
No	257 (80.6%)	62 (19.4%)	1.07	0.68-1.67	0.778
Yes	168 (81.6%)	38 (18.4%)	1		
Type of abortion					
Spontaneously	270 (79.6%)	69 (20.4%)	1.28	0.80-2.04	0.304
Induced	155 (83.3%)	31 (16.7%)	1		

4.6.3 Association between LARC uptake and Contraceptive Characteristics

There was no significant association between LARC uptake and LARC awareness, fear of side effect nor family planning approval ($p>0.05$). However, the proportion of those who chose LARC was slightly higher (19.7%) among those with no opposition to use compared to those who had opposition to use (15.8%). In addition, uptake of LARC was higher (21.1%) among those who said they had not heard about FP compared to those who said they had heard about FP (18.9%).

On the other hand, there was a significant association between LARC uptake and belief that implant/coil offers long term FP with a 2.14 higher chance of LARC use compared to the others {uOR2.14 CI (1.34-3.42) $p=0.001$.

A previous history of LARC use conferred a 1.82 times likelihood of use of LARC post abortion compared to those who had never used LARC. {uOR 1.82 CI (1.05-3.16) $P=0.032$ } as represented in table 7 below.

Table 7: Association between LARC uptake and Contraceptive Characteristics

Variable	Category	LARC uptake		uOR	CI	p-value
		No(%)	Yes(%)			
Knowledge of FP	Yes	411 (81.1%)	96 (18.9%)	1		
	No	15 (78.9%)	4 (21.1%)	1.14	0.37-3.52	0.817
Lack of awareness	Yes	100 (79.4%)	26 (20.6%)	1.15	0.69-1.89	0.595
	No	326 (81.5%)	74(18.5%)	1		
Not available	Yes	45(80.4%)	11(19.6%)	1.05	0.52-2.10	0.899
	No	381(81.1%)	89(18.9%)	1		
Opposition to use	Yes	80 (84.2%)	15 (15.8%)	1		
	No	346(80.3%)	85(19.7%)	1.31	0.72-2.39	0.378
Side effects	Yes	224 (80.3%)	55 (19.7%)	1.10	0.71-1.71	0.663
	No	202 (81.8%)	45 (18.2%)	1		
Offers long term FP	Yes	222(76%)	70(24%)	2.14	1.34-3.42	0.001
	No	204(87.2%)	30(12.8%)	1		
Peer influence	Yes	54(84.4%)	10(15.6%)	1		
	No	372(80.5%)	90(19.5%)	1.31	0.64-2.67	0.462
Accessibility	Yes	68(88.3%)	9(11.7%)	1		
	No	358(79.7%)	91(20.3%)	1.92	0.92-3.99	0.81
Previous use	Yes	57(72.1%)	22(27.9%)	1.82	1.05-3.16	0.032
	No	369(82.6%)	78(17.4%)	1		

Multivariate logistic regression analysis

Those factors that were found to be statistically significant on bivariate analysis were fitted into a multivariate logistic regression model to control for confounders. These results are as shown in table 8 below. They include:

Occupation and Uptake of LARC

Women who were housewives were 2.65 times more likely to choose LARCs compared to those who work away from home {aOR 2.65, CI (1.51-4.64) P=0.001}.

Gender of living Children and uptake of LARC

Having no living children was associated with a 2.71 odds of use of LARC although it was not statistically significant with a p value of 0.05.

Having boys as the gender of living children was associated with a 2.66 higher chance of using LARC. {aOR 2.66 CI (1.03-6.85) p=0.043}

Similarly, having children of both gender (boys and girls) increased the odds of using LARC methods by almost 3 times. {aOR2.92 CI (1.18-7.24) p=0.021}

Fertility desires/ timing of next pregnancy and LARC Uptake

With regard to uptake of LARC and the timing of the next child; women who planned to delay their next pregnancy for 2 years were 5.72 times more likely to take up LARC contraceptives {aOR 5.72 CI (2.68-12.16) P<0.001}.

Similarly, those planning to have their next pregnancy beyond 2years from the time of abortion had a 2.75 higher likelihood of LARC uptake compared to the rest. {aOR 2.75 CI (1.35-5.65) P=0.005}.

Conversely, women who did not plan on having another child in the future had a 2 times likelihood of LARC uptake, however this association was not statistically significant ($p = 0.058$).

Belief that LARC offers long-term family planning (FP):

Women who believed LARC offered long-term family planning options had a 3.61 higher likelihood of LARC uptake than those who did not. {aOR 3.61 CI (2.10-6.21) $P < 0.001$ }.

Previous LARC Use and Current LARC uptake

Individuals who had previously used long acting reversible contraceptives had a three and a half higher likelihood of LARC uptake in comparison those who had never used LARC before. {aOR 3.53 CI (1.84-6.76) $P < 0.001$ }.

Table 8: Factors associated with LARC uptake on Multivariate Analysis

Variables	aOR	95% CI	p-value
Work away from home			
Yes	Ref		
No	2.93	1.58 – 5.44	0.001
Children gender			
Girls	Ref		
None	2.71	0.99 – 7.37	0.050
Boys	2.66	1.03 – 6.85	0.043
Both	2.92	1.18 – 7.24	0.021
When to have next pregnancy			
<1 year	Ref		
2 years	5.86	2.72 – 12.66	<0.001
> 2 years	2.69	1.28 – 5.64	0.009
Never	1.85	0.81 – 4.24	0.144
Offers long term FP			
No	Ref		
Yes	3.74	2.13 – 6.58	<0.001
Previous LARC use			
No	Ref		
Yes	3.64	1.84 – 7.17	<0.001

aOR – Adjusted Odds Ratio

CHAPTER FIVE

5.0 DISCUSSION

5.1 Introduction

Post abortion family planning counselling and utilization is one of the components of comprehensive abortion care as advocated by WHO. Effective counselling and utilization of modern contraceptives and especially LARC has been associated with reduced repeat abortions, unwanted pregnancy and childbirth-related complications. In this regard, this facility-based cross-sectional study aimed to provide information regarding utilization of post abortion family planning and the factors influencing it.

5.1 Objective 1: To determine the proportion of women in the immediate post abortion period who chose a modern contraceptive method at Moi Teaching and Referral Hospital, Eldoret.

From this study, the uptake of modern contraceptive in the immediate post abortion period was **54.9%**. It is comparable to the national modern contraceptive prevalence of 56.9% and 59.2% among married and unmarried women respectively (National Bureau of Statistics Nairobi, 2023). This is also similar to a cross-sectional study conducted in fourteen public health facilities in central Uganda that reported a modern contraceptive prevalence of 60.6% (Atuhairwe et al., 2023) and the findings of a multinational study carried out in East and Southern Africa involving Kenya. The reported modern contraceptive uptake was 66.1% (Qureshi et al., 2022). Similarly, a Rwandan study looking at voluntary uptake of post abortion contraceptives across 17 health facilities reported an uptake of 47% (Packer et al., 2019).

This study found a higher uptake of modern contraceptives compared to a study in Tanzania that reported an uptake of 17.4% (Baynes et al., 2020). This may be explained by the fact that it was an exit interview for clients who had received PAC services at

various facilities. From the quantitative survey, only 30.1% of the respondents recalled receiving contraceptive counselling before leaving the hospital. It is possible some of the clients were not offered comprehensive contraceptive counselling before or after receiving PAC services. Lack of quality contraceptive counselling before and after PAC services has been associated with an increase in modern contraceptive uptake (Mbehero et al., 2022). The researchers did not have control over the quality of PAC and especially counselling and utilization of contraceptives. This is in contrast to our study where family planning counselling was done for all participants before they left the hospital.

In an interventional study carried out by Marie Stopes in Kenya aimed at improving private sector provision of post abortion contraceptives, both the baseline and post intervention uptake of modern contraceptives were lower than the current study findings at 19.3% and 30.79% respectively (Footman et al, 2017). The low uptake may be explained by the cost implications for contraceptives where participants were expected to pay for the method chosen. In contrast, the participants in this study received all the contraceptives free of charge. The other identified reasons for non-use of modern contraceptives were inadequate information or information that was insensitive to participants' needs, opposition to use of contraceptives and partner unavailability to give consent for FP.

A study conducted among young women, 24 years and below, receiving post abortion care in Nepal found a higher contraceptive uptake of 79% compared to this study (Mehata et al., 2019). This may be attributed to the long term involvement of Ipas, an NGO offering programmatic, technical, training, clinical support and equipment to ensure provision of high quality PAC services including contraceptive counselling. Regular training on CAC and PAC and mentorship programs for the healthcare workers

may have led to the improved quality of abortion care and post abortion contraceptive counselling, which in turn may have led to improved uptake of contraceptives (Mbehero et al., 2022). This is contrast to the current study where we had a mix in the types of abortions with majority being spontaneous with participants desiring pregnancy soon. In Guinea, in West Africa, the modern contraceptive uptake was 96.6% among women seeking post abortion care services in 2 public hospitals. This uptake is higher than the current study. This may be explained by the fact that most of the participants in that study had an induced abortion, meaning the pregnancy was unwanted and so the motivation to prevent further pregnancy may have been high(Mina Millimouno et al., 2019).In a facility based multi-center cross-sectional study involving 12 facilities drawn from the public and private hospitals and clinics in Ethiopia involving 483 post-abortion women, the modern contraceptive uptake was 77.8% (Motuma et al., 2022). This is higher than the current study finding. The difference may be attributable to the study population that was diverse involving both private and public facilities compared to this study which had participants from one public facility. The participants, particularly those in private facilities may have been more empowered to make decisions regarding their fertility choices hence the higher uptake of post abortion contraception. Furthermore, some of these facilities were supported by partners like Marie Stopes international, an NGO that supports abortion care. This may have contributed to better quality of PAC services including contraceptive counselling and provision which in turn may have improved uptake.

Similarly, a study in Kisumu, assessing contraceptive uptake in post abortion women, found a higher uptake of 75%. The difference may be attributed to the fact that the participants were seen 7-10 days post abortion and further contraceptive counselling was offered (Makenzius et al., 2018). The extra period may have given an opportunity

for participants to discuss with their spouses their fertility needs and best contraceptive options. Spousal consent has been shown to increase FP uptake while spousal disapproval is a known barrier to contraceptive uptake (Wendot et al., 2018)(Ontiri et al., 2019). This is in contrast the current study in which the participants received counselling once while still in the hospital without any follow-up.

In a South West Kenyan study involving 80 facilities drawn from both private and public health facilities across 5 counties, the modern contraceptive uptake was 85%. This is higher than the current study findings. This may be attributable to the interventions by the supporting NGO, Planned Parenthood Global. These interventions included training and mentorship of healthcare providers to improve quality of PAC services. They also had community involvement in an effort to reduce stigma, dispel myths and misinformation surrounding abortion care and contraceptives. Finally, they incorporated youth friendly services which may have improved uptake by youths who are the most affected with unintended pregnancies and abortions(Motuma et al., 2022).

5.2 Objective 2: To determine the proportion of women who would choose a LARC (IUCD and Implants) in the immediate post abortion period, at Moi Teaching and Referral Hospital, Eldoret.

The current study found a LARC uptake of **19.2%** with 4% of participants choosing an IUCD while 15.2% had a contraceptive implant.

In a study carried out in Guangzhou, China, among women receiving post abortion care, the IUCD uptake was high at 17.4% compared to 4% in our study. This difference may be attributable to the extended period of one-month post abortion at which uptake was measured while in the current study it was measured at discharge from the hospital which in most cases was within a week. This extended period may have provided the participants with adequate time for more counselling and decision making for contraceptive uptake. In addition, the participants were given brochures to take to their male partners for shared decision making. This may have further increased the uptake due to partner involvement, a factor that has been associated with increased uptake of post abortion modern contraceptives in general and LARC specifically. Additionally, the study population consisted of women who were seeking induced abortions only, in comparison to this current study which was composed of those with both induced and spontaneous abortions. Seeking abortion may have meant the pregnancies were unwanted and hence a higher motivation for an effective post abortion family planning method (Feng et al., 2022).

In another Chinese study looking at factors associated with choice of family planning following an induced abortion, the LARC uptake was still higher than the current study findings at 41.1% with most of this being IUCD use at 40.8% and implants at a 0.3%(Tong et al., 2023). The difference may be due to China's policies that restrict the number of children per family. This may increase the number of induced abortions

following unplanned pregnancies and hence the need for a long term and effective contraceptive methods like IUCD (Tong et al., 2023)(Frett, 2015).

In Guinea, a study looking at uptake of modern contraceptives among clients seeking post abortion services found a higher LARC uptake of 63.2%. This may be explained by the study population that was mainly composed of single women who had unsafely induced abortions. They were most likely highly motivated to get an effective method of contraception to prevent future unplanned pregnancies that may lead to repeat unsafe abortions (Mina Millimouno et al., 2019).

In south west Kenya, Mbehero et al found a LARC uptake of 90% compared to 19.4% in the current study. This may be explained by the nature of the study which was an interventional program based partner supported study. It employed multiple approaches to improve LARC uptake among young women. The study ensured there were adequate supplies of contraceptives, conducted regular continuous training and mentorship to improve quality of post abortion care services. They also engaged the community in order to reduce stigma, myths and misconceptions in addition to providing youth friendly services. These interventions differ from the current study in the sense that the staff training was short, and there was no community involvement to try and correct misinformation, myths and misconceptions related to modern contraceptives and to get a buy in from the whole community as pertains abortions and contraceptives (Mbehero et al., 2022).

An Ethiopian facility based, cross-sectional study looking at post abortion family planning and associated factors, the LARC uptake rate was 15.8% with an IUCD rate of 4.9% and implants at 10.9%. Both are comparable to the current study findings (Motuma et al., 2022). Similarly, Baynes et al, in Tanzania, while assessing post

abortion fertility desires, family planning uptake and unmet FP needs, found an IUCD uptake of 4.3% that was similar to the current study at 4%. However, the rate of uptake of implants was lower at 1.2% compared to this study's findings of 15.2% (Baynes et al., 2020). Majority of their participants did not choose a contraceptive method (86.2%) before leaving the health facilities. Additionally, only 30% of the participants recalled having received quality contraceptive counselling and information. Since majority of them did not receive contraceptive counselling, the participants may not have realized the importance of contraceptives in the immediate post abortion period. Secondly, they may not have known which contraceptive methods are good for them depending on their fertility desires and medical condition. Thirdly, they probably would not know which family planning methods were available and whether the health care providers had the necessary skills to provide them. All these may have impaired the participants' decision making concerning utilization of post abortion contraception.

In a study assessing both postpartum and post abortion LARC uptake in Islamabad, Pakistan, the post abortion LARC uptake was lower than the current study at 3.4%. None of their study participants selected a IUCD. The difference may be due to the study methodology which was a retrospective case control study looking at patients' records. This may mean the researchers had no control over the quality of care given to the participants, unlike in the current study where all participants were counselled before discharge from the hospital. There are a lot of documented fear, myths and misconceptions surrounding IUDs, these may have contributed to the women shunning it (Mazhar & Batool, 2018).

Another study with a lower LARC uptake was conducted in Kisumu, Kenya where the LARC uptake was 4.1%, with none of the participants choosing an IUCD (ODERO, 2019). The study was assessing uptake and adherence following counselling by

physicians and midwives. The low uptake may be explained by myths and misconceptions that were found during the qualitative interviews namely; being labelled a prostitute (stigma), birth defects and destruction of the vaginal wall during removal of the IUCD.

Makenzius et al in Kisumu looking at post abortion contraceptive uptake as a secondary outcome found a lower uptake than the current study at 8.7%. This may have been due to periods stock outs of the LARC methods as explained in their study limitations. This in contrast to the current study where all the contraceptive methods were available throughout the study period (Makenzius et al., 2018).

5.3 Objective 3: What are the factors that influence LARC uptake among women receiving post abortion care at Moi Teaching and Referral Hospital, Eldoret.

In the current study, five factors were found to significantly influence LARC uptake in the immediate post abortion period. These were:

1. Previous LARC use by the participants
2. Having boys or both boys and girls as living children of the participants
3. Desire to delay the next pregnancy for two or more years
4. Being a housewife /being unemployed
5. Belief that LARC offers long term contraception

Previous LARC use

In this study, women who had previously used LARC were three times more likely to choose a LARC method. (aOR 3.53 (1.84-6.76) <0.001). This may be attributed to familiarity with the method by the participants making it easier to accept it. This was also identified by Luo et al in a study that assessed intentions and barriers of LARC use in women seeking abortion services in China. The odds of using LARC in women who had previously used LARC was twice while in the current study it was thrice(Luo et al., 2018). Similarly, a Tanzanian study by Baynes et al found prior contraceptive use to be significantly associated with FP uptake among post abortion women (Baynes et al., 2020). The other factors identified include level of education (primary), FP counselling and receiving post abortion care at a lower level health facility. Another study conducted in Kampala, Uganda among women of reproductive age found a significant association between previous use of LARC and current LARC use(Anguzu et al., 2014).

In another study in Amhara, by Marie Stopes international, looking at post abortion contraceptive uptake, Previous FP use was significantly associated with general modern

contraceptive uptake in the post abortion period. A similar find to the current study. The other significant associations found were age, marital status, involvement of others in decision making for family planning and receiving contraceptive counselling (Abebe et al., 2019). Age and Marital status were assessed but not found to be significant associations in the current study.

In contrast, Asubiojo et al in their mixed methods study assessing the predictors and barriers to post abortion FP assessed previous contraceptive use and found it not to have a statistically significant association with current contraceptive use. However, the proportion of participants who took up a LARC method was higher in those with prior FP use than those who had not (Asubiojo et al., 2021). The significant association was marital status, where being single or separated was associated with increased odds of contraceptive use. This was not found to be significantly associated with LARC uptake in the current study.

In a multi-center Ugandan study by Atuhairwe et al, previous LARC use was not found to have a significant association with LARC uptake among its participants, a departure from our study findings. This may be due to the fact that their study focused on second trimester abortions only, while the current study looked at both first and second trimester abortions. However, religion, planned pregnancy, and grand multi-parity were the factors significantly associated with second trimester PAFP uptake in their study (Atuhairwe et al., 2023). All these factors were assessed in the current study but were not found to be significant associations.

In a systematic review and meta-analysis of 29 cross-sectional studies conducted in Eastern Africa by Bizuneh et al, found those who had previously used contraception were 4.63 times more likely use to contraceptives (AOR=4.63; 95% CI 2.27–5.21)

similar to the current study. The other factors associated with post-abortion family planning utilization in Eastern Africa included married marital status, multiparity, having a history of abortion, and getting counselling on post-abortion family planning (Bizuneh & Azeze, 2021a). The only factor similar to our study findings is previous contraceptive use. The rest were assessed but were not found to be significant.

Gender of the living children.

In this study, participants who had both boys and girls were almost three times more likely to take up a LARC method as compared to those with girls only. {aOR 2.92 CI (1.18-6.85) p=0.021. Similarly, those participants who had male children (boys), had a 2.66 increased chance of using LARC methods compared to those who had girls only {aOR 2.66 CI (1.03-6.85) p=0.043. This could be attributed to the value of a boy child in our African context and local society. Most societies expect a couple to have at least one son who will continue their lineage and is considered an heir. Because of these, those women with no male child will most likely desire to get pregnant as soon as possible in their quest to find a male child. This, therefore may reduce the chances of using a LARC method. On the other hand, those with boys will be more likely to accept a LARC method since they already have satisfied societal expectations.

This finding is similar to a study conducted in Pakistan among slum dwelling women in a bid to facilitate client centered counselling in a bid to improve uptake of modern contraceptives. In this study women with no male child had poor uptake compared to those who had at least one male child (AOR: 2.05, 95% CI: 1.53, 1.44). Similarly, women with no female child also had a poorer uptake of LARC compared to those who had at least one female child alive (AOR: 1.86, 95% CI: 1.59, 2.25) (Fazal et al., 2023). This was explained by social and cultural norms in which male children are valued as

heirs, and propagating the family line. As concerns the girl child, families without a girl in our set up would also be less likely to use a LARC contraceptive in order to increase their chances of conception and then likely give birth to a girl.

Being a housewife (working within the home)

In this study, the odds of choosing a LARC method were twice more likely if one was a housewife compared to those who worked outside the home (aOR.2.65, 95% CI (1.5-4.64) 0.001). This may be attributed to a higher frequency of sexual activity in this population necessitating use of a reliable contraceptive to prevent unplanned pregnancies. This was demonstrated by Luo et al in China where increased sexual frequency amongst housewives was associated with increased LARC uptake (Luo et al., 2018).

Kasiye et al, in Ethiopia found a significant association in which, housewives were more likely to take up post abortion LARC compared with daily laborers or those who worked outside the home. This is similar to the current study findings. This may be due to negative peer influence concerning LARC use among those who work outside the home(Kasiye Shiferaw,&, 2017).

Asrat et al, in another Ethiopian study found a positive association between being a house wife and modern contraceptive uptake. This association was however, not elicited with LARC uptake. Having an induced abortion and being a student were the only statistically significant associations with LARC uptake(Asrat et al., 2018). These factors were assessed in the current study but were not found to be significant associations.

C. Tong et al in a study assessing factors associated with choice of contraceptive following an induced abortion in China found that unemployed individuals were more

likely to use reliable FP methods than farmers and workers were (Tong et al., 2023). This is similar to the findings of the current study. This may be due to the need for effective contraception to prevent unintended pregnancies.

On the contrary, Asubiojo et al in their mixed methods assessed occupation and it was found not to be significantly associated with contraceptive uptake(Asubiojo et al., 2021). Similarly, Luo et al in a Chinese study did not find occupation or lack of it to be significantly associated with LARC uptake(Luo et al., 2018). In addition, Ontiri et al, assessed occupation and found farming and paid employment were significant associations of LARC uptake on Bivariate analysis but when controlled for confounders, they ceased to be significant(Ontiri et al., 2019).

Odero et al in their study conducted in Kisumu, Kenya, looking contraceptive uptake following contraceptive counselling among post-abortion women, occupation was found to significantly influence contraceptive uptake but in the opposite direction from our study findings. Participants in formal employment were 3.8 times more likely to take contraceptives compared to the unemployed and self-employed, contrary to our findings where contraceptive uptake was more likely among the unemployed(ODERO, 2019).

Desire to delay the next pregnancy

This study found a 5.72 time odds of participants who wished to delay the next pregnancy for two years to utilize a LARC method compared to those who desired pregnancy within 1 year (aOR 5.72 (2.68-12.16) <0.001). There is also a 2.75 time more likelihood if the delay in pregnancy is more than 2 years (2.75 (1.35-5.60) 0.005).

A study by Luo et al in China looking at intentions and barriers of LARC use in women seeking abortion services had a similar finding(Luo et al., 2018). The other significant factors associated with increased LARC use in the Chinese study were previous LARC use (similar to current study), married marital status and higher frequency of sexual activity.

In Guinea, West Africa, not willing to get pregnant within 2 years post abortion was associated with a 4.8 odds of post abortion LARC(Mina Millimouno et al., 2019). This is similar to the current study findings. In a local study conducted in 12 public rural health facilities in Kakamega assessing LARC uptake and its associated factors, no desire for more children had a 3.77 odds of use of LARC in contrast to the current study where no association was found among those who had no desire for more pregnancies. Desire to delay fertility for 2 years and more was also found to significantly influence LARC uptake with an aOR of 2.94 comparable to this study which was 2.69. This is in agreement with our study findings most likely because of the similarity of the population in both studies. The other significant factors found were religion specifically protestants who were less likely to choose LARC compared to Catholics. This was not demonstrated in our study. Tertiary level of education was also associated with higher uptake of LARC, a departure from our study findings where level of education was not a significant factor. This may be explained by the differences in study set up, with the

Kakamega being rural, hence heterogeneous education levels, while ours is mainly urban and hence expected higher education levels (Ontiri et al., 2019).

In contrast Atuhairwe et al in Uganda found no significant association between desire to delay pregnancy and LARC uptake (Atuhairwe et al., 2023). This was also found not to be significant by Kosgei et al, MTRH (Kosgei, 2015)

Offers Long Term Contraception

In this study, those who reported LARC offers long term contraception were 3.74 times more likely to choose a LARC method than those who did not (aOR 3.74 (2.13-6.58) <0.001).

In a mixed methods study in Uganda assessing factors that influence LARC use among women of reproductive age, the most commonly mentioned reason for choosing a LARC method was longer protection, followed by better choice for child spacing, effectiveness, and wanting a method that does not require daily application. Longer protection was the most commonly mentioned at 77.3% by urban dwelling women and 94.7% by women from rural areas with a p value of 0.026 (Tibaijuka et al., 2017). This is similar to what was found in the current study.

Barriers to LARC Uptake

The most commonly mentioned barrier in this study was fear of side effects. Some of the frequently mentioned side effects were, painful insertion and removal, migration of the coil, irregular bleeding, impaired future fertility and decreased libido (makes them cold). Other barriers included opposition to use both from self or spouse, preference of other methods like herbal contraceptives and desire to get pregnant sooner. None of the mentioned barriers was statistically significant.

These barriers are similar to those identified by Luo et al namely; anxiety relating to impaired future fertility, LARCs being harmful to health, irregular bleeding, risk of IUD failure and lack of awareness with respect to LARCs (36.1%)(Luo et al., 2018).

In a mixed methods study by Baynes et al, the following were the recurring themes in the in depth interviews of PAC clients. These included; fear of side effects, misconception, myths and misinformation, gender power differences and lack of partner support, and experience with health care providers in seeking family planning (Baynes et al., 2020). Apart, from fear of side effects, the rest of the barriers could not be assessed in our study probably due to differences in methodology. Our study was quantitative while theirs was mixed methods with a qualitative component that made it possible to identify the barriers more effectively.

Similarly, Asubiojo et al also identified misconception and misinformation from communication and interaction in the community as great barriers post abortion contraceptive uptake (Asubiojo et al., 2021). This is different from our study due to the qualitative component in their methodology.

According to a systematic review by Buckingham et al on post-partum and immediate post-abortion LARC uptake among adolescents, inadequate information given during counseling and misconceptions about LARC/reproductive health were identified as barriers to access and the role of partners and community as contraception gatekeepers(Buckingham et al., 2021).

5.3 Study Strengths and Limitations

5.3.1 Study Strengths

Information was collected just before the clients were discharged from the hospital.

This minimizes recall and information bias.

This is the first study investigating post abortion LARC and the factors influencing it in MTRH

Assessed a large number of variables ensuring a comprehensive assessment of possible factors associated with LARC uptake.

5.3.2 Study Limitations

1. This was a hospital based study whose findings may not be generalized to the larger population.
2. Used an interviewer administered questionnaire potentially introducing social desirability bias. To mitigate this, the research assistants were not staff working in the ward.
3. The uptake of contraceptive methods that were to be used by the client at home like pills and condoms could not be ascertained. The mere taking of pills and condoms was assumed to be equal to use by the client.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

1. The Modern Contraceptive uptake at MTRH is **56.4%** in the immediate post abortion period
2. The post abortion LARC uptake was **19.2%** which generally very low compared similar studies in the region including the Kenyan National LARC uptake of **37%** according to KDHS 2022.
3. Factors that were significantly associated with increased LARC uptake:
 - a. Being a housewife or unemployed
 - b. Desire to delay the next pregnancy for 2 or more years
 - c. Having children of both sexes and boys only
 - d. Awareness that LARC offers long-term contraception
 - e. Previous LARC use

6.2 Recommendations

1. Routine targeted contraceptive counselling on a wide range of available FP methods including LARC for post abortion women to reduce missed opportunities and the unmet need for FP.
2. Further Qualitative research involving all stakeholders to gain an in-depth understanding of factors influencing and barriers to LARC uptake.
3. Focused discussions with religious leaders concerning the burden of unsafe abortions that are preventable with use of modern contraceptives to get their buy in in safe management of unintended pregnancies.

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APPENDICES

APPENDIX I: ENGLISH QUESTIONNAIRE

CONFIDENTIAL INFORMATION TO BE USED FOR RESEARCH PURPOSES ONLY

Questionnaire No: _____

Respondent's unique ID: _____

CONSENT FORM

Good morning/afternoon/evening. My name is Dr. Esther Akelo. I am a doctor and student in reproductive health at Moi university school of medicine. I am speaking with women admitted in this hospital with miscarriages about using family planning.

Study title: UPTAKE OF LONG-ACTING REVERSIBLE CONTRACEPTIVE METHODS AMONG WOMEN RECEIVING POST ABORTION CARE IN MOI TEACHING AND REFERRAL HOSPITAL, ELDORET

Purpose of the study: To determine the reasons that encourage women who have had miscarriages to use family planning methods and what prevents them from using the same. The findings will give an insight to health policymakers to enable them to come up with strategies that will help improve use of family planning following a miscarriage to prevent future unplanned pregnancies and miscarriages.

Risks: There are minimal risks expected during this study, like talking about psychological issues that may be emotional to some clients. We will offer psychological support. Those who will choose to have either a coil or implant inserted will experience pain but pain medications will be provided to take care of that. **Rights:** You have a right to decline to participate in the study or withdraw from it at any stage of questioning without affecting the care offered to you while you are in hospital.

Confidentiality: All your responses will be kept confidential. Your identity will not be revealed, but the information collected will be seen by those involved in this study.

Benefits: There are no direct benefits to you, but the information gathered will help us to improve our services, in regard to issuing contraceptives following a miscarriage.

Cost and Compensation: The cost of the implant and coil will be met by the researcher. You will be expected to pay your hospital bill incurred while in the ward. There will be NO money payment for participating in this study.

If you have any questions about this study, you are free to ask now.

Emancipated minors: Clients who are less than 18 years or whose caretakers are minors will be treated as emancipated minors.

In case of questions: If you have any questions, you can contact the investigator

At the end of the interview, I would also like to let you know that if you choose to use any family planning method you will be given.

CONSENT FORM.**STATEMENT OF CONSENT**

I, the undersigned, acknowledge that the principal investigator/the research assistant has fully explained to me the nature, purpose, and procedures involved in this study. I appreciate that participation is completely voluntary; that my refusal or withdrawal from this study will not in any way affect any medical service or medical advice I may need now and in the future. I, therefore, sign here as proof of my consent for participating in this study.

Name.....

Signature or Right thumb imprint.....

Date.....

ASSENT FORM (for those below 18)

Name of Principle Investigator: Dr. Esther Akelo Ng'ang'a.

Name of Institution: Moi Teaching and Referral Hospital

This Informed Assent Form has two parts:

- **Information Sheet (gives you information about the study)**
- **Certificate of Assent (this is where you sign if you agree to participate)**

You will be given a copy of the full Informed Assent Form

Part I: Information Sheet

Introduction

My name is Esther Akelo, and I am a doctor. I also do research. I am speaking with teenagers and young people admitted in this hospital with miscarriages about using family planning.

I am going to give you information and invite you to be part of a research study.

- You get to decide if you want to take part.
- You can say 'No' or you can say 'Yes'.
- No one will be upset if you say 'No'.
- If you say 'Yes', you can always say 'No' later.
- You can say 'No' at any time.
- We would still take good care of you no matter what you decide.

You can talk to your parents and friends about this research, it is your decision.

There may be some words or sentences you don't understand. Please ask me to stop at any time, and I will take time to explain.

Purpose of research

To find out what family planning methods are used by women who have had miscarriages to prevent unwanted pregnancies. Specifically, to find out how many

would choose implants and coil, and what would be their reasons for either choosing or not choosing. The information collected will help to better ways to address use of family planning in young people.

Rights

If you don't want to be in the research study, you don't have to be. It is also okay to say yes and change your mind later. You can stop being in the research at any time. If you want to stop, please tell the research doctors. This will not affect how you will be treated; you will still receive standard medical care. This research does not interfere with the treatment you get in the hospital.

Risks: This research does not interfere with the kind of treatment you get in hospital so it will not hurt and no danger is expected. There will be during pain during insertion of the implants and coil, but adequate pain medications will be given to you.

You can say 'no' to what we ask you to do for the research at any time and we will stop.

Benefits: Nothing really good might happen to you now, but if you agree to participate, you will help the researcher to understand and improve provision of family planning to teenagers like you in future.

You will not receive any money or gift for participating in this research

Confidentiality: We will not tell other people that you are in this research and we won't share information about you to anyone who does not work in the research study. After the research is over, you will be told the results.

Information about you that will be collected from the research will be put away and no-one but the researchers will be able to see it. We will lock that information up with a lock and key.

You can ask me questions now or later. You can ask the nurse questions. If you want to talk to someone else that you know, like your teacher or doctor or auntie, that's okay too.

If you sign your name on this page, it means that you agree to take part in this research study. You may change your mind any time for any reason.

PART 2: Certificate of Assent

I have read this information (or had the information read to me) I have had my questions answered and know that I can ask questions later if I have them.

I agree to take part in the research.

Signature of Participant _____

(To be written by child/adolescent or thumb print if illiterate)

Date: _____

Day/month/year

Thumb print

I confirm that the child was given an opportunity to ask questions about the study, and all the questions asked by him/her 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.

Print Name of Researcher/person taking the assent _____

Signature of Researcher /person taking the assent _____

Date _____

Day/month/year

Section 1: Social demographic information

1. In which year were you born? _____
2. What is your religion?
 - 1) Protestant
 - 2) Catholic
 - 3) Islam
 - 4) Other (Specify) _____
3. What is your marital status?
 - 1) Single
 - 2) Married
 - 3) Widowed
 - 4) Divorced/Separated
 - 5) Other (Specify) _____
4. What is the highest level of education you have attained?
 - 1) Never been to school
 - 2) Primary
 - 3) Secondary
 - 4) Tertiary
5. Aside from housework, do you work outside of the home to earn money?
 - 1) Yes
 - 2) No
6. What is your main source of income?
 - 1) Trading
 - 2) Salaried employment
 - 3) Casual employment
 - 4) Farming
 - 5) Any other (Specify) _____
7. How many times have you carried a pregnancy for more than 28 weeks (7 months) {parity?} _____
8. How many times have you miscarried before 28 weeks? _____

9. How many living children do you have?

1) Boys _____

2) Girls _____

10. How many children in total do you desire to have? _____

11. When do you intend to have your next pregnancy?

1) Less than 1 year

2) 2 years

3) More than 2 years

4) Never

12. Was this a planned pregnancy?

1) Yes

2) No

13. How did you lose this pregnancy?

1) Spontaneously

2) Induced

Section 2: Family Planning

14. Have you ever heard of family planning?

1) Yes

2) No

15. Which family planning methods do you know of? Tick the ones mentioned.

(overview of the mode of action, benefits, side effects, MEC considerations and

failure rates will be given by the researcher)

1) Pills

2) Injection (Depo)

3) Emergency pill (morning after pill)

- 4) Coil
- 5) BTL
- 6) Vasectomy
- 7) Condoms
- 8) Diaphragm
- 9) Patch
- 10) Withdrawal
- 11) Calendar method
- 12) Implants
- 13) Other(Specify)

16. Have you ever heard of contraceptive implant and coil as methods of family planning?

- 1) Yes
- 2) No

17. Have you ever used any of these methods before?

- 1) Yes
- 2) No

18. Have you ever received any information on how these methods work?

- 1) Yes
- 2) No

19. Where can you get the contraceptive implants and a coil as a method of FP?

- 1) Health facility
- 2) Community health workers
- 3) Pharmacy/chemist
- 4) Don't know
- 5) Others(specify)

20. What are some of the reasons that may make you **NOT WANT** to use implants or coil for family planning?

- 1) Lack of awareness
- 2) Not available
- 3) Opposition to use (from self or spouse or religion)
- 4) Side effects
- 5) Others (specify)

21. What are some of the reasons that would make you **WANT** to use the coil or implants?

- 1) Offers long term FP
- 2) Peer influence
- 3) Accessibility
- 4) Previous use
- 5) Others_____

22. When do you plan to start using any family planning method?

- 1) Immediately
- 2) Later
- 3) Don't know
- 4) Never

23. Which family planning method would you like to use?

- 1) Specify

24. Would you like to get contraceptive method before you leave the hospital?

- a. Yes
- b. No
- c. Not decided

25. List the contraceptive method issued





Thank you for participating in this study.

APPENDIX 2: STUDY BUDGET

The researcher will meet the costs of the study including stationery, local travel and communication costs.

Items	Quantity	Unit Price (Kshs)	Total (Kshs)
<i>Stationery & Equipment</i>			
Printing Papers	5 reams	500.00	2,500.00
Black Cartridges	2	2,000.00	4,000.00
Writing Pens	1 packet	500.00	500.00
Flash Discs	1	2,000.00	2,000.00
Box Files	2	200.00	400.00
Document Wallets	2	50.00	100.00
Sub total			9,500.00
<i>Research Proposal Development</i>			
Printing drafts & final proposal	10 copies	500.00	5,000.00
Photocopies of final proposal	6 copies	100.00	600.00
Binding of copies of Proposal	5 copies	100.00	500.00
Subtotal			6,100.00
Pilot study			
Printing questionnaire			1,000.00
Transport			2,000.00
Subtotal			3,000.00
<i>Thesis Development</i>			
Printing of drafts and final thesis	10 copies	800.00	8,000.00
Photocopy of final thesis	6 copies	200.00	1,200.00
Binding of thesis	6 copies	300.00	1,800.00
Publication	1	20,000	20,000.00
Subtotal			31,000.00
Total			49,600.00
Miscellaneous Expenditure			30,000.00
Grand Total KSH			79,600.00

APPENDIX 4: IREC APPROVAL

 MOI TEACHING AND REFERRAL HOSPITAL P.O. BOX 3 ELDORET Tel: 33471023	 MOI UNIVERSITY COLLEGE OF HEALTH SCIENCES P.O. BOX 4605 ELDORET Tel: 33471023 28 th July, 2021
INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)	
Reference: IREC/2021/117 Approval Number: 0003937 Dr. Esther Akelo Ng'ang'a, Moi University, School of Medicine, P.O. Box 4606-30100, ELDORET-KENYA.	
Dear Dr. Ng'ang'a,	
<u>UPTAKE OF LONG ACTING REVERSIBLE CONTRACEPTIVE METHODS AMONG WOMEN RECEIVING POST ABORTION CARE IN MOI TEACHING AND REFERRAL HOSPITAL, ELDORET</u>	
This is to inform you that <i>MTRH/MU-IREC</i> has reviewed and approved your above research proposal. Your application approval number is <i>FAN: 0003937</i> . The approval period is 29th July, 2021- 28th July, 2022 . This approval is subject to compliance with the following requirements:	
<ol style="list-style-type: none"> i. Only approved documents including (informed consents, study instruments, Material Transfer Agreements (MTA) will be used ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by <i>MTRH/MU-IREC</i>. iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to <i>MTRH/MU-IREC</i> within 72 hours of notification. iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to <i>MTRH/MU-IREC</i> within 72 hours. v. Clearance for export of biological specimens must be obtained from <i>MOH at the recommendation of NACOSTI</i> for each batch of shipment. vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal. vii. Submission of an executive summary report within 90 days upon completion of the study to <i>MTRH/MU-IREC</i>. 	
Prior to commencing your study, you will be required to obtain a research license from the National Commission for Science, Technology and Innovation (NACOSTI) https://www.nacosti.go.ke and other relevant clearances from study sites including a written approval from the CEO-MTRH which is mandatory for studies to be undertaken within the jurisdiction of Moi Teaching & Referral Hospital (MTRH) and its satellite sites.	
Sincerely,  PROF. E. WERE CHAIRMAN INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE	
cc CEO - MTRH - Dean - SOP Principal - CHS - Dean - SON Dean - SOM Dean - SDD	

APPENDIX 5: HOSPITAL AUTHORIZATION



An ISO 9001:2015 Certified Hospital



MOI TEACHING AND REFERRAL HOSPITAL

Telephone: +254(0)53-2033471/2/3/4
 Mobile: 722-2072770/722-2097550/734-6004670/734-683331
 Fax: 053-2061749
 Email: ceo@mtrh.go.ke/directorsoffice@mtrh@gmail.com

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

Ref: ELD/MTRH/R&P/10/2/V.2/2010

30th July, 2021

Dr. Esther Akelo Ng'ang'a
 Moi University
 School of Medicine
 P.O. Box 4606-30100
ELDORET-KENYA

UPTAKE OF LONG ACTING REVERSIBLE CONTRACEPTIVE METHODS AMONG WOMEN RECEIVING POST ABORTION CARE IN MOI TEACHING AND REFERRAL HOSPITAL, ELDORET

You have been authorised to conduct research within the jurisdiction of Moi Teaching and Referral Hospital (MTRH) and its satellite sites. You are required to strictly adhere to the regulations stated below in order to safeguard the safety and well-being of staff, patients and study participants seen at MTRH.

- 1 The study shall be under Moi Teaching and Referral Hospital regulation.
- 2 A copy of MTRH/MU-IREC approval shall be a prerequisite to conducting the study.
- 3 Studies intending to export human bio-specimens must provide a permit from MOH at the recommendation of NACOSTI for each shipment.
- 4 No data collection will be allowed without an approved consent form(s) to participants unless waiver of written consent has been granted by MTRH/MU-IREC.
- 5 Take note that data collected must be treated with due confidentiality and anonymity.

The continued permission to conduct research shall only be sustained subject to fulfilling all the requirements stated above.

Dr. Wilson K. Aruasa
DR. WILSON K. ARUASA, EBS
 CHIEF EXECUTIVE OFFICER
 MOI TEACHING AND REFERRAL HOSPITAL



c.c. - Senior Director, Clinical Services
 - Director of Nursing Services
 - HOD, HRISM

All correspondence should be addressed to the Chief Executive Officer

Visit our Website: www.mtrh.go.ke

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