# FACTORS ASSOCIATED WITH USE OF LONG-ACTING REVERSIBLE CONTRACEPTIVES AMONG WOMEN SEEKING FAMILY PLANNING SERVICES AT TWO REFERRAL HOSPITALS IN NAIROBI COUNTY, KENYA.

BY:

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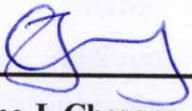
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## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **aOR** | Adjusted Odds Ratio |
| **CI** | Confidence Interval |
| **COCs** | Combined Oral Contraceptives |
| **cOR** | Crude Odds Ratio |
| **DMPA** | Depot- medroxyprogesterone acetate |
| **HIV** | Human Immunodeficiency Virus |
| **HR** | Hazard Ratio |
| **IUDs** | Intrauterine devices |
| **KAP** | Knowledge Attitude and Practice |
| **KDHS** | Kenya Demographic and Health Survey |
| **KNH** | Kenyatta National Hospital |
| **KNH- UoN ERC** | Kenyatta National Hospital- University of Nairobi Ethics Research Committee |
| **LARCs** | Long-acting Reversible Contraceptives |
| **LMICs** | Low- and Middle-Income Countries |
| **LNG-IUS** | Levonorgestrel- releasing intrauterine system |
| **NACOSTI** | National Commission for Science Technology and Innovation |
| **OR** | Odds Ratio |
| **PI** | Principal Investigator |
| **PMTCT** | Prevention of Mother to Child Transmission |
| **POPs** | Progestogen- only pills |
| **RAs** | Research Assistants |
| **SARCs** | Short-acting Reversible Contraceptives |
| **SSA** | Sub-Saharan Africa |
| **STROBE** | Strengthening the Reporting of Observational studies in Epidemiology |
| **USA** | United States of America |
| **VCT** | Voluntary Counseling and Testing |
| **WHO** | World Health Organization |

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## DEFINITION OF OPERATIONAL TERMS

| | |
|---|---|
| **Long acting reversible contraceptives** | Refers to either contraceptive implants (for example Jadelle or Implanon) or intrauterine devices (IUDs) (for example levonorgestrel-releasing intrauterine system (LNG-IUS) or copper IUDs). |
| **Short acting reversible contraceptives** | Refers to combined oral contraceptives (COCs), progestogen-only pills (POPs), depot-medroxyprogesterone acetate (DMPA) contraceptive injection or condoms. |
| **Women of Reproductive Age** | Refers to women aged 15- 49 years (WHO, 2006). |

# ABSTRACT

## Background

Long-acting reversible contraceptives (LARCs) have been proven to be effective in reducing unplanned pregnancies. However, in Kenya, the utilization of LARCs is lower compared to short-acting reversible contraceptives (SARCs). The underlying reasons for this lower prevalence of LARCs use remains poorly understood.

## Objectives

The aim of this study was to establish factors associated with use of LARCs among women seeking family planning services at two referral hospitals in Nairobi County, Kenya.

## Methods

This was a hospital-based unmatched case control study where LARCs users were cases and SARCs users were controls. The study was conducted in Kenyatta National Hospital and Mbagathi Sub-County Hospital. Participants were selected using systematic random sampling at a 1:1 case control ratio (n=206). Univariable and multivariable logistic regression was utilized to investigate the effect of the predictors on the odds of LARCs use.

## Results

From the multivariable analysis occupation (aOR=3.87; 95% CI: 1.78-8.40; p=0.001) & (aOR=3.51; 95% CI: 1.36-9.07; p=0.009), level of education (aOR=4.12; 95% CI: 1.51-11.21; p=0.006), desire to have a child in the future (aOR=0.36; 95% CI: 0.16-0.80; p=0.012) and future desired birth interval (aOR=2.94; 95% CI: 1.15-7.50; p=0.006) were identified as significant predictors of use of LARCs.

## Conclusion

The study demonstrated that socio-demographic factors such as level of education and occupation had a statistically significant association with the use of LARCs. Additionally, reproductive factors such as desire to have children and future desired birth interval were statistically associated with use of LARCs. These findings suggest that tailored interventions should be targeted to meet this demographic and reproductive group.

# 1.0. INTRODUCTION

## 1.1. Background

Globally, 64 unintended pregnancies occur for every 1,000 women of reproductive age (15-49 years) and of these unintended pregnancies 61% have ended in abortions (Bearak et al., 2020). According to the most recent Kenya Demographics and Health Survey, 14% of currently married women and 19% of sexually active but unmarried women have an unmet need for family planning (KNBS, 2023).The unmet need for family planning in Nairobi County is 12.5% (KNBS, 2023). Unmet need for family planning refers to the percentage of women who (1) desire to delay or stop having children, are not currently pregnant or breastfeeding, and are not using any form of contraception (2) have a mistimed or unwanted pregnancy or (3) are currently breastfeeding and gave birth within the past two years, but their last pregnancy was mistimed. It has been demonstrated that having access to effective contraception reduces the number of unintended pregnancies and abortions (Birgisson et al., 2015; Peipert et al., 2012). Contraceptive methods that are reversible can be classified as either short or long acting. Short acting reversible contraceptives (SARCs) include oral pills, injectables, male and female condoms, contraceptive patches and vaginal rings. Intrauterine contraceptive devices (IUDs) and contraceptive implants are examples of long-acting reversible contraceptives (LARCs). LARCs are distinct in that they are not user dependent, do not necessitate care more frequently than once every three years, are safe among healthy women even those who have a cardiovascular condition and they have a failure rate of less than 1% for prevention of unplanned pregnancies and abortions (Grimes, 2009; Vu et al., 2016; Winner et al., 2012).

Different studies around the globe have proved that LARCs offer more benefits than non-LARCs. As revealed in a study done in United Stated of America (USA), LARCs methods are discontinued less with the risk of discontinuation being three-fold higher among non-LARCs users compared to LARCs users (Hazard Ratio (HR$_{adj}$)=3.08, 95% confidence interval (CI)= 2.80-3.39) (Diedrich et al., 2015). In an experimental study carried out in Kenya to determine the role of first contraceptive choice in preventing unintended pregnancy, 24% of study participants chose implants while the remainder chose SARCs, with 22 unintended pregnancies occurring among the 396 individuals in the SARCs arm and no pregnancies occurring in the implant users (LARCs arm) (Hubacher et al., 2012). Another study conducted to assess whether births after use of LARCs are intended found that four in five births following LARCs were reported to be intended pregnancies, compared to only three in five births following use of a non- LARCs method (Eeckhaut & Rendall, 2021). The results of a study carried out in 36 low- and middle-income countries (LMICs) found that 31.2% of unintended pregnancies were

among users of SARCs which could have been prevented by use of LARCs (Bellizzi et al., 2020). Another prospective cohort study followed up women for three years after their first birth; 84% of women who had a pregnancy in ≤ 18 months were SARCs users and no pregnancies occurred among users of LARCs (Masinter et al., 2017). It is estimated that between 37 and 60 maternal deaths, 315 to 424 child mortalities, 634-853 combined maternal morbidity and mortality and child mortality, and 1056-1412 unsafe abortions are expected to be avoided as a result of the use of LARCs (Bahamondes et al., 2014).

Despite all these benefits, the prevalence of use of LARCs is low globally (at 5.6%) and < 10% in Latin America and the Caribbean (Joshi et al., 2015; Ponce de Leon et al., 2019). In Kenya, the statistics for LARCs utilization are 4.4 % and 18.5% for IUDs and implants, respectively (KNBS, 2023). Likewise, in our study area (Nairobi County) the utilization of LARCs is at 6.3% and 12.9% for IUDs and implant respectively (KNBS, 2023). Most women prefer SARCs over LARCs despite their high discontinuation rate of > 40% as opposed to a discontinuation rate of < 9% for LARCs users, the reasons cited for discontinuation are side effects and users wanting more effective contraceptive methods (Ontiri et al., 2019).

The factors affecting LARCs utilization are multifaceted. Socio-demographic factors such as higher level of education, older age, religion, employment status and husband approval have been shown to affect LARCs utilization (Gayatri, 2020; Ontiri et al., 2019; Shiferaw & Musa, 2017) . Previous unintended pregnancy, history of abortion and number of living children are among the reproductive factors affecting LARCs utilization (Dassah et al., 2013; Gashaye et al., 2020; Moreau et al., 2013). Health facility factors such as cost of contraception and availability at the health facility have also been cited as reasons that affect utilization (Radovich et al., 2019; Tibaijuka et al., 2017). Myths and misconceptions about LARCs are barriers to utilization (Anguzu et al., 2014; Dawood & Dawood, 2017). Levels of knowledge, attitude and practice also affect utilization of LARCs (Galle et al., 2018; Jonas et al., 2021).

This study seeks to examine the factors associated with use of LARCs in two referral hospitals in Nairobi County, Kenya among women attending family planning clinics. The factors investigated will be socio-demographic, reproductive and health facility factors. The information gathered from this study will enhance efforts in achieving Sustainable Development goal three of "Good Health and Well-being". The information will also assist implementation efforts of policy makers and planners and other organizations working in family planning and maternal health.

## 2.0. LITERATURE REVIEW

### 2.1. Introduction

This chapter provides an outline of previous works on contraceptives, prevalence of use of LARCs and factors associated with the use of LARCs.

### 2.2. Contraception Definition

Modern contraceptive methods are defined by Hubacher & Trussell as a product or medical process that prevents reproduction from sexual actions (Hubacher & Trussell, 2015). Contraceptives that do not fit this definition are termed as non-modern contraceptives. However, of note is that this categorization does not address concerns of effectiveness or efficacy. There are three categories of modern contraceptives: LARCs such as IUDs and implants; permanent contraceptive methods such as sterilization and vasectomy and SARCs for example oral pills, injectables, male and female condoms, foam tablets, diaphragm and cervical cap.

A term that is not so popular but has also been used to refer to LARCs is forgettable contraception. Forgettable contraception has been defined as a method that does not require attention such that it can be forgotten and only requires attention every three years if any (Grimes, 2009). The default status of these methods is protection against pregnancy because no intervention is needed for a long period of time by the user. Examples of methods characterized as forgettable contraceptives are sterilization (female or male), IUDs and implants. Sterilization method of contraception is included in forgettable contraception but not in LARCs as the procedure is not reversible.

The LARCs available to women of reproductive age in Kenya are copper IUDs, levonorgestrel-releasing intrauterine system (LNG-IUS) and the etonogestrel implant. Copper IUDs is a T-shaped device that can last for up to ten to twelve years with 380mm of copper wire wrapped around the stems and arms. The LNG-IUS is similar to copper IUDs and can be used for up to five years. It has a polyethylene frame medicated with a reservoir of 52 mg of levonorgestrel reservoir that releases 20 µg everyday through a rate limiting membrane. The etonogestrel implant is 4cm long and 2mm in diameter. It contains 68 mg of the progestin etonogestrel which is delivered at a rate of 60-70 µg per day for the first week after insertion then 25-30 µg per day by the third year. It is approved for three or five years of use (Espey & Ogburn, 2011).

### 2.3. Prevalence of use of Long-acting Reversible Contraceptives

Several studies have been conducted about the global prevalence of use of LARCs. Data analyzed from three cross-sectional national probability surveys in France found that a minority of women were using LARCs at 5.4% with majority of the women using user dependent

hormonal contraception at 75.1%, which tend to be mostly SARCs (Moreau et al., 2013). LARCs such as IUDs and implants are used by only 16.5% of Indonesian women of reproductive age (Gayatri, 2020). A study in Nepal found the utilization of LARCs to be very low at 4.7% with the use of IUDs and implants at 1.4% and 3.4%, respectively (Bhandari et al., 2019).

There have been studies on the prevalence of use of LARCs in Africa. A study conducted in eight countries in sub-Saharan Africa (SSA) found an upward trend in utilization of LARCs, for example, Malawi increased use from 0.46% to 9.76% between 2004 and 2016 and in Zimbabwe from 1.04% to 8.51% between 2006 and 2015 (Adedini et al., 2019). Another study conducted primarily in 26 countries in SSA found that 21.73% utilize LARCs ranging from 1.94%- 54.96% in Namibia and Benin respectively (Bolarinwa et al., 2021). Among women aged 15-49 years in Uganda the prevalence of LARCs use is 23.3% with a lower prevalence in urban clients at 19.2% compared to rural clients at 31.7% (Tibaijuka et al., 2017).

There have been several studies conducted in Ethiopia about the prevalence of use of LARCs. A study conducted in Western Ethiopia found the prevalence rate of LARCs to be 17.6% (Sahilemichael, 2015). A study on reproductive age women in Southern Ethiopia found an overall prevalence of LARCs at 18.3% (Kebede et al., 2020). A community-based study also conducted in Southern Ethiopia found a prevalence of LARCs utilization of 22% (Tilahun et al., 2020). Results from another study in Ethiopia determined that the utilization of LARCs is at 30.3% specifically 12.98% and 17.3% for IUDs and implant utilization, respectively (Fekadu et al., 2017). A recent study in Southern Ethiopia reported the utilization of LARCs among the study participants to be 37.8% specifically, 9.6% and 28.2% for IUDs and implant utilization, respectively (Gujo & Kare, 2021).

Studies on the prevalence of use of LARCs have also been conducted in Kenya. According to a study conducted in twelve public health facilities in Kakamega County, LARCs are used 20.6% of the time with use of IUDs and implants at 3.8% and 16.8% respectively (Ontiri et al., 2019). An analysis of the 2014 Kenya Demographic & Health Survey (KDHS) database found use of implants to be 16.4% (Lunani et al., 2018). An analysis of the same database found that in the young women and adolescents' population 18% use LARCs (Kungu et al., 2020). The results of the 2022 Kenya Demographic and Health Survey were just released this year and comprehensive research papers are yet to be published (KNBS, 2023).

**2.4. Factors associated with use of Long-acting Reversible Contraceptives**

**2.4.1. Socio-demographic factors associated with use of Long-acting Reversible Contraceptives**

Tertiary educated women are more than two times more likely to use LARCs (aOR=2.58, 95% CI = 1.10-6.033) compared to women who have primary education or no education in rural Kenya (Ontiri et al., 2019). This finding is similar to that observed in an Ethiopian study where women with grade twelve level of education were 4.42 times more likely to use LARCs compared to those who did not have any formal education or were illiterate (Fekadu et al., 2017).This could be due to the fact that educated women have more access to information and health care services and freedom to make decisions and may even request use of LARCs before counseling (Tibaijuka et al., 2017). A contrary finding in Ghana was found where women who were less educated than those with a superior educational training were more likely to choose LARCs (Dassah et al., 2013). However, some studies have discovered that education is not an important predictor of use of LARCs (Bhandari et al., 2019; Kungu et al., 2020).

According to a study conducted across several countries in SSA, the relative risk of using LARCs was 2.72 in women who were widowed, 6.83 in women who were separated, 7.49 in divorced women and 11.24 in women who were married or living with a partner, compared to women who had never been married (Adedini et al., 2019). A study conducted on adolescents and young women found a moderate negative association between use of LARCs and marital status; those who were married were 26% less likely to use LARCs compared to those who were not married or living with a partner (Kungu et al., 2020). Another study conducted among students found a different finding where compared to single students married students were nearly four times more likely to use LARCs adjusted odds ratio= 3.97; 95% CI 2.05-7.67 (Aregay et al., 2018). This may be likely due to the fact that married students had regular sexual intercourse than their non-married counterparts thus the need to use LARCs.

A study conducted in Enugu State University Teaching Hospital in South-East Nigeria found that majority of the new acceptors of LARCs were Christians at 86.93% (Okafor, 2018). A study conducted in Nigeria found, women who were exposed to family planning messages from religious leaders had higher contraceptive utilization than those who were not exposed to family planning messages from religious leaders (OR= 1.70; 95% CI 1.54-1.87; P<0.01) (Adedini et al., 2018). Protestants and other Christian women were 63% less likely to use LARCs compared to women who had no religion or other religion in the young women and adolescent population (Kungu et al., 2020). This finding shows that religion and religious leaders play a significant role in contraceptive uptake. Religion, on the other hand, has not been

found to be a significant predictor of use of LARCs in some research studies (Dawood & Dawood, 2017).

Adolescent girls in Kenya (aged 15-19 years) were 27% less likely to utilize LARCs than young women aged 20-24 (Kungu et al., 2020) . This is in agreement with what was observed in Indonesia where the odds of utilizing LARCs was 1.8 times higher in women aged 20-49 years relative to those aged 15-19 years (Gayatri, 2020). This outcome could be explained by the needs of younger women being birth spacing and delaying of pregnancies while older women have achieved their desired family size and completed their family. However, some research has found that age is not a significant predictor of use of LARCs (Sahilemichael, 2015).

A study carried out in Western Ethiopia determined that those women whose husbands approved their current LARCs choice were 1.99 times more likely to utilize LARCs than those who did not have their husband's approval (Sahilemichael, 2015). Another study in North Western Ethiopia concurred with this finding and found that women who had discussed with their husbands about contraceptives were 1.8 times more likely to use LARCs compared with those who did not have a discussion (Gudaynhe et al., 2014). A similar study found that women whose husbands did not approve the use of LARCs, specifically implants, had 0.11 lower odds of utilizing LARCs relative to women whose husbands approved their use (Abera et al., 2020). These findings underscore the importance of discussion with husbands about contraceptives choice.

A study conducted in Ethiopia found that daily laborers were less likely to utilize LARCs compared to housewives, aOR= 0.3, 95 % CI; 0.01-0.8 (Shiferaw & Musa, 2017). Similarly, a study conducted using data from the 2016 Ethiopian Demographic and Health Survey found that women employed with cash income had 41% higher odds of utilizing LARCs and permanent methods relative to women who were not working adjusting for other variables (Yohannes Dibaba et al., 2019). This may be due to access of information and services in this group. Contrastingly, a nationally representative survey of women in France was done and those unemployed were more likely to rely on LARCs than those in other occupations (Moreau et al., 2013).

## 2.4.2. Reproductive factors associated with use of Long-acting Reversible Contraceptives

In Ghana, women with at least three surviving children were found to be more likely to use LARCs compared to those who had fewer than three children (Dassah et al., 2013) . This finding is also similar in the population of young women and adolescents in Kenya where they had an 18-fold increase in chances to use LARCs for those with up to two children in contrast

to those who have no living children (Kungu et al., 2020). A study in Indonesia corroborated this finding where women with three or more children had higher odds of utilizing LARCs compared to those who had no children or less than two children (Gayatri, 2020). A study conducted to assess the demand for LARCs and associated factors in Ethiopia found that women who had five or more children had 1.67 times higher demand for LARCs compared to women who did not have children (Yalew et al., 2015). A study in Nepal found a contrary finding where women who had two or less than two children were 1.5 times more likely to use LARCs compared to women who had three or more living children (Bhandari et al., 2019). This may have been attributed to women and couples who felt that two or fewer children would be insufficient in their lives and they opted to space their pregnancies with reversible long-term methods rather than SARCs.

A study conducted in Kenya on women of reproductive age found that the strongest predictor for use of LARCs is not desiring more children with an adjusted odds ratio of 3.77, p=0.01 (Ontiri et al., 2019). Another study in Ethiopia corroborated this finding and found that women who wanted to limit their births were 2.4 times (aOR=2.38, 95% CI= 1.01-5.62) more likely to use LARCs compared to those who desired a child soon (Gashaye et al., 2020) . An adjusted odds ratio of utilization of LARCs of 8.2 was found in women in southern Ethiopia who had no desire to have children compared to those who desired to have a child (Tilahun et al., 2020). Compared to women who desired four to six children, women who desired no children and one extra child had respectively about ten (aOR=10.21, 95% CI= 3.10-33.58) and four times (aOR=4.70, 95% CI= 1.68-13.13) the odds of intending to use LARCs and permanent contraceptives (Syum et al., 2019). Another study conducted on HIV positive women in Northwest Ethiopia found that desire not to have more children (aOR=7.60, 95% CI= 3.77-15.34) was statistically significantly associated with the use of LARCs and permanent methods (Gelagay et al., 2018). However, some studies have found that desire to have more children is not a significant predictor of use of LARCs (Ajong et al., 2018).

A study conducted among female college students found that 75.2% of the study participants had a history of abortion (Aregay et al., 2018). This high percentage can be linked to the fact that college students are more likely to be young and unprepared for a child thus likely to procure abortions. A study conducted in Kampala district to assess the factors associated with use of LARCs found that about 21% of the study participants reported that they had ever had an abortion (Anguzu et al., 2014). A study in Ethiopia found that the odds of using LARCs was 2.7 times higher in women who had a history of abortion compared to those who did not have an abortion (Gashaye et al., 2020). This is likely due to the fact that repeat abortions are

significantly lower in women who use LARCs than those who do not use LARCs (Rose & Lawton, 2012). A study conducted in a post-abortion clinic in China found that 42.5% of the respondents intended to use LARCs in the immediate post-abortion period specifically 13.9 35.2% and 13.9% intended to use IUDs and implants, respectively (Luo et al., 2018) .

Compared to women who had no previous unintended pregnancies those who had a previous unintended pregnancy were 2.4 times more likely to use LARCs,  this study was conducted in France (Moreau et al., 2013) . A study conducted in the USA discovered that one-quarter of the study participants had an unintended pregnancy which was associated with current use of LARCs (OR=2.8; 95% CI, 1.3-5.8) (Dempsey et al., 2012). In a retrospective study conducted among adolescents who were terminating their unintended pregnancy to investigate contraceptive choice before and after termination, before termination 97.1% chose a non-LARCs method and after termination 60% chose to use LARCs (Kokanalı et al., 2019). A study conducted on postpartum women found that the odds of using LARCs was 1.44 times higher in women who had their most recent pregnancy unintended and 1.29 times higher in women who were unsure about their most recent pregnancy compared to women whose most recent pregnancy was intended (Oduyebo et al., 2019). All these findings support the evidence that women who have had a previous unintended pregnancy are more likely to use LARCs as they are more effective in reducing pregnancies as opposed to other methods (Harper et al., 2015).

A study revealed that when it came to their desired birth interval in the future, 69.2% of the participants expressed a desire for either birth spacing or limiting. Surprisingly, even though LARCs and permanent methods are the most effective methods in birth spacing or limiting, 85.2% of the participants were not using them (Haile et al., 2016). According to a study conducted in Kenya, the odds of using LARCs among women who wanted children after more than two years were almost two times more compared to those who wanted children within two years (Ontiri et al., 2019). Another study conducted to assess the intent to use LARCs among postpartum women found that 17% of women whose desired birth interval was two or more years wanted to use LARCs, compared to 43% of women whose desired birth interval was less than two years, for an adjusted relative risk of 1.9 (95% CI, 1.2-2.8) (Tang et al., 2013). A study conducted among adolescents offered immediate postpartum LARCs specifically implants sought to determine repeat pregnancy rates. The study found that women who had not had an immediate postpartum LARCs specifically implants were eight times more likely to have a repeat pregnancy at 12 months than women who had an immediate postpartum LARCs (Tocce et al., 2012).

**2.4.3. Health facility factors associated with use of Long-acting Reversible Contraceptives**

A mixed method study conducted in Uganda found that availability of LARCs at the health center determined utilization; clients in this population had to wait for a radio announcement to know when LARCs were available at the health center thus resorted to use of pills and condoms that were readily available (Tibaijuka et al., 2017). This finding is consistent with a Mozambican study where a third of the study participants did not receive their preferred contraceptive method as it was not available in the facility at that time (Galle et al., 2018). Another study conducted in a rural health center in the USA found that ordering of LARCs took between two weeks and two months through a mail-order delivery service thus withholding prompt patient care (Janiak et al., 2018). Another study in Togo found that LARCs use is highly associated with supervisory visits conducted in the previous three months to monitor stock out levels (OR=1.44, 95% CI = 1.48-2.39) (Weidert et al., 2020). A study conducted in Ghana to determine the availability of modern contraceptives and perceived factors affecting this found that LARCs were the least available at 14% this was because there was no demand for these methods (Adjei et al., 2015).

A southern Ethiopia study found that women were 4.1 more times likely to utilize LARCs when they discussed LARCs with their health care providers as opposed to those who did not have a discussion (Tilahun et al., 2020). A qualitative study among educated women in Kenya on utilization of LARCs, specifically LNG-IUS, found that those participants who were advised by their health care provider and were persuaded to utilize the method ended up opting for a LARCs specifically LNG-IUS (G. Nanda et al., 2018). A research study conducted in a contraceptive clinic found that only 20.20% of the patients studied were fully aware about the different LARCs methods with only 8.69% receiving knowledge and awareness from medical personnel, highlighting the gap in health worker counseling and communication about LARCs (Dawood & Dawood, 2017). A cross-sectional study conducted in Mozambique found that < 1% of the study participants were administered LARCs despite being counseled on IUDs and implants respectively 23% and 33% of the time in the consultation room (Galle et al., 2018) . This finding highlights a major gap in adequate consultation by health care providers and underutilization of available LARCs. However, in a qualitative study in the USA it was found that among health care staff administering LARCs where some staff felt that counselling visits were a hurdle for women who already knew their contraceptive options and had decided on their choice of contraceptive (Janiak et al., 2018).

A qualitative study conducted in Nigeria to understand how method-specific characteristics affect method choice found that cost as a factor had divergent views. Some participants viewed

SARCs such as pills as high cost as they required constant replenishment despite low individual cost of the pills while LARCs such as implants initial cost may be high but there are no follow up costs (Sanchez et al., 2021). According to a study in Kenya, half of the public sector utilized free services for contraceptive delivery with users of implants, IUDs, condoms and pills more likely to receive method for free (p<0.001) than injectable users which is a SARCs (Radovich et al., 2019). Another study conducted in the USA found that women requesting an IUDs were 11.4 times likely to have it placed if the out-of-pocket expenses are less than $50 (Gariepy et al., 2011). A study conducted in the USA to determine the cost-effectiveness of not using a contraceptive, using LARCs or using SARCs found that even though LARCs are not used for the entire duration of efficacy their use in comparison to SARCs resulted in cost-savings within three years of use (Trussell et al., 2015) . Another study conducted by the same author to compare cost-effectiveness of LNG-IUS found that compared to SARCs initiating contraception on LARCs specifically LNG-IUS resulted in total lower costs and 31% saving over three years of use (Trussell et al., 2014). A study conducted in an Appalachian private practice found the odds of using LARCs decreased for every additional $100 out-of-pocket expense incurred by the patient (Broecker et al., 2016).

There are other health facility factors that are associated with LARCs utilization. A study was carried out on women attending the six weeks postnatal routine visit found that women generally had to come for two other visits one for counselling and one for insertion of LARCs, this was a major hindrance for women accessing LARCs (Lunniss et al., 2016). Guidelines recommend for same day LARCs provision in the USA, unfortunately same day LARCs provision is low with 37% and 51% for IUDs and implants, respectively (Judge-Golden et al., 2020). Barriers to same day LARCs provision identified in this study were stock outs, scheduling limitations, lack of space to perform the procedures and billing concerns. Among postpartum women not using LARCs but interested in LARCs the reasons cited for non-use of LARCs were 11% could not afford LARCs, 26% missed their 6-week postpartum visit and 45% were told to come back for an additional insertion visit (Zerden et al., 2015). A study carried out in the United Kingdom on exploring midwives' views on giving postpartum contraceptive advice found that the midwives expressed concerns of heavy workloads and barriers such as lack of privacy and mothers being preoccupied with babies (Mccance & Cameron, 2014). A study conducted to access the views of sexual health providers towards postpartum IUDs insertion cited perceived challenges as workload, lack of clinical experience and access to ultrasound to view IUDs with non-visible threads (Cooper et al., 2018).

**2.4.4. Knowledge, Attitude and Practice factors for Long-acting Reversible Contraceptives**

Diverse levels of knowledge of LARCs affect use of LARCs. Galle et al, determined the knowledge of IUDs and implants and found that the knowledge about these LARCs was limited with 14-22% of patients with adequate knowledge (Galle et al., 2018). Among women in Lubaga division, Uganda, those who knew where implants were inserted were 1.83 times more likely to use implants than those who did not know where they were inserted (95% CI = 1.172.87; p=0.008) (Anguzu et al., 2014). Among young unmarried adults in the USA those women who had a high level of knowledge of IUDs were 5.8 times more likely to be current users of LARCs as compared to those who had low level of knowledge of IUDs (95% CI = 1.5-23; p=0.005) (Dempsey et al., 2012). A study conducted to assess the intention to use LARCs specifically the implant found that women who had greater knowledge on safety of implants in comparison to those who had less knowledge were more likely to consider future use of this LARCs method (OR=2.17 95% CI = 1.66-2.87; p=0.01) (Jonas et al., 2021).

Women have varied attitudes that may affect utilization of LARCs. In southern Ethiopia women who had a positive attitude towards LARCs were 1.76 times more likely to utilize LARCs than those who did not have a positive attitude (95% CI = 1.01-3.04) (Kebede et al., 2020). Another study conducted in Southern Ethiopia to explore associations between awareness, attitude and barriers with intention to use LARCs and permanent methods among SARCs users found that 52% (n=216 /416) had a negative attitude towards use of LARCs and permanent methods and women who were found to have a positive attitude were 2.5 times more likely to intend to use LARCs and permanent methods compared to women who had a negative attitude (95% CI = 1.48-4.11) (Meskele & Mekonnen, 2014). Different myths and misconceptions found in Ethiopia about contraception usage may cause a high proportion of women to have a negative attitude towards them (Mohammed, 2017). A study conducted to detect factors involved in why women choose LARCs found that only 18% of the respondents had ever used LARCs this may be due to the relative high proportion of women who had neutral attitudes about LARCs ranging from 21-40% thus preferring to use other methods (Bracken & Graham, 2014).

Women have different practices when it comes to the use of LARCs. In a knowledge, attitude and practice study conducted in Egypt, 88.7% of the women were not using LARCs and for those that were using LARCs cited reason for use as child spacing or fertility termination (Mitwaly et al., 2019).

**2.4.5. Barriers to use of Long-acting Reversible Contraceptives**

Women attending a comprehensive clinic in Egypt were asked about their misbelieves about LARCs and 3.07% believed they were linked to osteoporosis and dyspareunia, 11.50% believed LARCs was linked to cancer pathogenesis, 71.61% believed they caused irreversible infertility, 76.98% believed they caused irreversible weight gain and 79.54% believed they caused permanent amenorrhea (Dawood & Dawood, 2017). In India, an ecological model was used to determine barriers to unprotected sex in adult married women who did not desire more children. The study divided the reasons into three categories with 56% citing inadequate counselling as a sociological reason, 62% citing actual or perceived side-effects of contraceptives as a personal/ individual reason and 62% stating mother-in-law's opposition as a social reason (S. Nanda et al., 2020). A qualitative study carried out in Pakistan established that misconceptions shared through social networks discouraged the use of particular LARCs in favor of other LARCs where implants were perceived to cause infertility and stop menstrual cycles, thus participants opted for use of IUDs (Sarfraz et al., 2021).

In Uganda one third of the study participants agreed with the myth that the use of LARCs causes permanent infertility. The same study found that women agreed to the statement that LARCs should be used by married women only and this reduced the use of LARCs among women (Anguzu et al., 2014). A research study executed in France found lower odds of using LARCs, specifically IUDs, in women who had misconceptions such as they should only be used by parous women and that LARCs increased the risk of infertility (Moreau et al., 2013).

A study conducted on a sample of female college students in USA found several barriers use of LARCs, specifically IUDs, including 23% not being in a long-term relationship, 27% had concerns over the cost implications, 42% did not know enough about the method, 42% preferred a method they have more control over and 44% did not want a foreign object in their body (Hall et al., 2016). A study conducted among adolescents found that many of the adolescents studied had fears that acted as barriers to LARCs utilization some feared that they would become permanently fixed and unable to be removed, while others feared that they would fall out during showering or sexual intercourse (Potter et al., 2014). Women attending a post-abortion clinic cited barriers to use of LARCs as lack of awareness of LARCs (36.1%), risk of IUDs failure (41.6%), irregular bleeding (44.3%), LARCs being harmful to health (45.2%) and anxiety related to future impaired fertility (56.2%) (Luo et al., 2018). Another study carried out in Ghana reported a barrier to IUDs use as gender of provider in that participants preferred a female provider performing the IUDs insertion (Robinson et al., 2016).

## 2.5. Summary of Literature Review

Reversible contraceptives can be classified as either short or long acting (SARCs or LARCs). The LARCs contraceptives readily available in Kenya are copper IUDs, LNG-IUS and the etonogestrel implant. The global, national and local prevalence of use of LARCs is generally low with most women of reproductive age preferring SARCs despite their higher rates of unintended pregnancies as opposed to LARCs. It is evident from various studies conducted in different countries that the factors associated with use of LARCs among women of reproductive age are multiple. Factors associated with use of LARCs can be grouped into three: sociodemographic, reproductive and health facility factors. Levels of knowledge and attitude have also been shown to affect the utilization of LARCs.

## 2.6. Conceptual framework

Figure 2.1 depicts the relationship between factors predicted to be associated with the use of LARCs. The interaction between the independent variables and the outcome (utilization of LARCs) is illustrated.

The independent variables can be grouped into three groups namely socio-demographic, reproductive and health facility related factors. The socio-demographic factors include age, level of education, occupation, marital status, religion, area of residence and spousal approval of contraceptive use. The reproductive factors include desire for more children, number of children, previous planned pregnancy and desired future birth interval. The health facility factors include availability of LARCs, adequacy of counselling and cost. The socio-demographic variables are distal determinants while the reproductive and health facility factors are proximate determinants. The outcome is utilization of LARCs. Regarding, the independent variables some variables may be directly associated with the outcome (utilization of LARCs) and also related with other factors which in turn are associated with the outcome (utilization of LARCs).
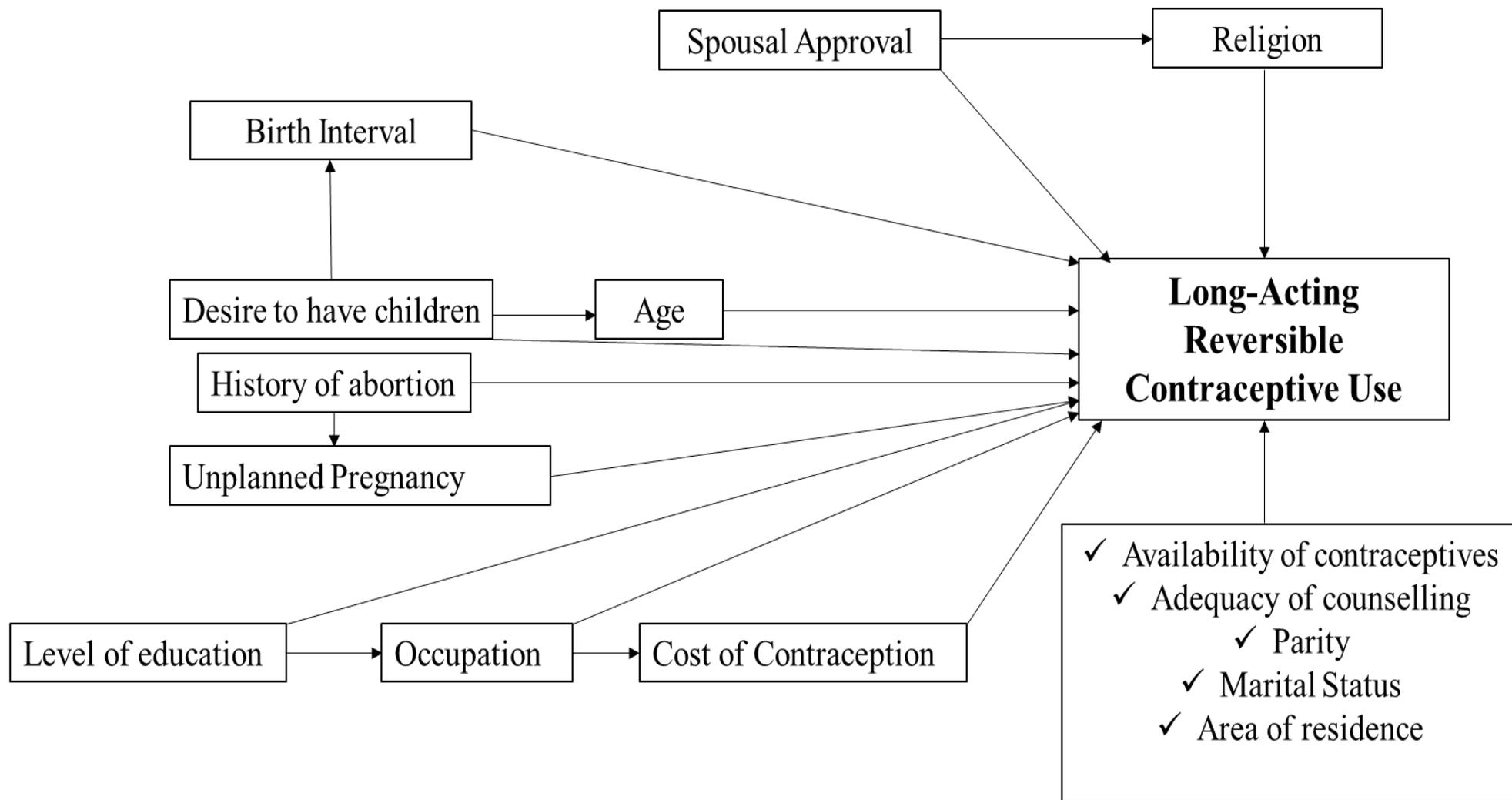
**Figure 2.1: A causal diagram depicting the factors thought to be associated with use of long-acting reversible contraceptives among women seeking family planning services at two referral hospitals in Nairobi County, Kenya between June and September 2022**

## 2.7. Statement of the research problem

The aim of contraception is to prevent conception. LARCs offer significant potential in mitigating the occurrence of unintended pregnancies. The prevalence of LARCs use in SSA is 21.73% ranging from 1.94% to 54.96% (Bolarinwa et al., 2021). Evidence suggests that the use of more effective methods, notably LARCs, by women has the potential to prevent one-quarter of unintended births and up to 50% of induced abortions (Bradley et al., 2011). Children that are born out of unintended pregnancies are more likely to have a late start to antenatal care, low birth weight, no breastfeeding (Mohamed et al., 2019) and poor child development (Singh et al., 2017). Mothers on the other hand are more likely to have poorer mental health outcomes later on in life (Herd et al., 2016). In addition, unintended pregnancies are also costly to society, estimated to cost €158 million yearly (Engstrand & Kopp Kallner, 2018).

The contraceptive prevalence rate among currently married women in Kenya is 57% and LARCs use accounts for only 22.9% of this (KNBS, 2023). The contraceptive prevalence rate in Nairobi County, the study area, among currently married women is 56.2% with LARCs uptake at 6.3% and 12.9% for IUDs and implants respectively. The prevalence of unintended pregnancies in Nairobi, Kenya is 24% (Ikamari et al., 2013). Within Nairobi County, Kenya, it has been reported that women who predominantly use SARCs were almost three times more likely to experience unintended pregnancies (Ojuok et al., 2022). In a study's findings, it was evident that young women living in Nairobi's urban slums leaned towards induced abortion as their preferred strategy for coping with unintended pregnancies (Mumah et al., 2020). Furthermore, this study revealed that majority of the young women had to discontinue their education to address the unintended pregnancy, resulting in lower educational attainment and reduced career prospects in the long run (Mumah et al., 2020). Women experiencing unintended pregnancies in Kenya are less likely to seek antenatal care, and when they do, they often attend fewer appointments than the recommended (Ochako & Gichuhi, 2016).

The National Family Planning Costed Implementation Plan (2017-2020) had targets to increase uptake of LARCs to 7% and 16% for IUDs and implants respectively these targets have not been achieved in the study area of Nairobi County, Kenya (MOH, 2017). To achieve these goals, it is necessary to comprehend the factors associated with use of LARCs. According to global studies, the main factors associated with utilization of LARCs are number of living children, desire for more children, unintended pregnancy, cost and socioeconomic factors (Adedini et al., 2019; Bolarinwa et al., 2021; Moreau et al., 2013). The factors associated with

use of LARCs in Nairobi County could be the same as the previous studies conducted above, but this has not been assessed.

## 2.8. Justification

Factors associated with LARCs utilization have been studied globally (Adedini et al., 2019; Bolarinwa et al., 2021; Moreau et al., 2013). In Kenya, few studies have been conducted on factors associated with LARCs utilization in women of reproductive age (Ontiri et al., 2019). Furthermore, when these studies have been conducted, they have had a cross-sectional study design and have focused on a specific demographic such as female sex workers (Ampt et al., 2019), adolescents (Kungu et al., 2020) or in general use of modern contraceptives (Achwoka et al., 2018; Jalang'O et al., 2017; Kamuyango et al., 2020; Lunani et al., 2018) and not specifically on use of LARCs.

This study focuses on LARCs, which have been proven to reduce unplanned pregnancies. The outcomes will benefit sexual and reproductive health of women of reproductive age. This research study will add to the existing body of knowledge about the factors that influence LARCs uptake. The study findings will shed light on the reasons behind the limited uptake of LARCs and help shape future policy. Uptake of LARCs results in healthy women having planned pregnancies, which results in lower mother and child deaths and improved socioeconomic status.

Additionally, there is inadequate data on factors that drive LARCs uptake in Nairobi County and the findings will inform program planners and policy makers on the gaps in LARCs uptake so that LARCs service uptake can be improved. This study will determine factors associated with LARCs utilization in patients attending two referral hospitals in Nairobi County, Kenya. Specifically, the study will seek to determine socio-demographic, reproductive and health facility factors associated with use of LARCs, highlighting gaps at the hospital level that can be targeted to expand access to and utilization of LARCs.

## 2.9. Research question

What socio-demographic, reproductive and health facility factors are associated with use of LARCs among women seeking family planning services at two referral hospitals in Nairobi County, Kenya?

## 2.10. Objectives

### 2.10.1. Broad Objective

To determine the factors associated with use of LARCs among women seeking family planning services at two referral hospitals in Nairobi County, Kenya.

**2.10.2. Specific Objectives**

Among women seeking family planning services at two referral hospitals in Nairobi County, Kenya to determine:

1. socio-demographic factors (education, marital status, religion, age, area of residence husband's approval and employment status) associated with use of LARCs

2. reproductive factors (parity, desire to have more children, history of abortion, previous unintended pregnancy and future desired birth interval) associated with use of LARCs

3. health facility factors (availability of LARCs, adequacy of counselling and cost) associated with use of LARCs

**2.11. Hypotheses**

**2.11.1. Null hypothesis**

There is no association between socio-demographic, reproductive and health facility factors and utilization of LARCs.

**2.11.2. Alternative hypothesis**

There is an association between socio-demographic, reproductive and health facility factors, and utilization of LARCs.

## 3.0. METHODOLOGY

### 3.1. Introduction

This chapter will go through the study design, area and population, the definition of cases and controls, eligibility criteria of study participants, sample size calculation and sampling strategy, study variables and their method of measurement, plan for data collection, processing and analysis, minimization of errors and biases, ethical consideration and study results dissemination plan.

### 3.2. Study design

To identify the factors associated with use of LARCs, a hospital-based unmatched case-control study design was applied. A case-control study design was considered appropriate because use of LARCs is a rare outcome. In Kenya, only 4.4 % and 18.5% of women use IUDs and implants respectively (KNBS, 2023). Despite the fact that a population-based case-control study design would be preferable, a hospital-based unmatched case-control study design was utilized because of the easily accessible women for identification of cases and controls attending the two clinics thus also reducing cost of the study. The study was conducted over a four-month period from June 2022 to September 2022. The STROBE guidelines for reporting observational studies was used to report the study (KULLER et al., 2007).

### 3.3. Study area

Two referral health facilities in Nairobi County, Kenya (that is, Mbagathi County Hospital and Kenyatta National Hospital, KNH) were the study sites. The specific study sites were the Family Planning Clinics of the two hospitals. Conducting the study in two facilities increases the generalizability of the study findings. The two facilities were also selected as they have a high catchment population offering services to Nairobi County and neighboring counties residents.

Mbagathi County Hospital is a public health facility that offers health care services at a subsidized cost. The health facility is approximately 5 km from Nairobi city center. The hospital has a capacity of 200 beds and offers integrated inpatient and outpatient services, as well as antenatal and postnatal care, family planning services and comprehensive obstetric care. It also has a comprehensive care clinic that provides HIV services such as voluntary counseling and testing (VCT) as well as prevention of mother to child transmission (PMTCT). The specific study area was the Family Planning Clinic. Approximately 60 women seek family planning services from the clinic every month and these services are offered from Monday to Thursday, 8am to 4pm.

KNH is one of the level six hospitals in the country. It is the largest referral hospital in the country and also in East and Central Africa. The hospital has an 1800- bed capacity and includes 50 wards, 22 outpatient clinics, 24 specialized theaters and an Accident & Emergency department. The hospital offers comprehensive medical services such as surgical, pediatric, obstetric and gynecological, diagnostic, pharmaceutical and emergency services. The study was carried out in the Reproductive Health Clinic (Clinic 66). The clinic offers various services including family planning, colposcopy, fistula treatment, day care gynecological surgery and well-baby immunization. There are approximately 30 women who seek family planning services from Clinic 66 every month and these services are offered from Monday to Friday, from 8am to 1pm.

## 3.4. Study population

All women aged 18-49 years attending the family planning and reproductive health clinic at Mbagathi County Hospital and KNH, respectively, between June 2022 to September 2022 made up the study population. As earlier stated in Section 3.3, every month, approximately 60 women seek family planning services from the Mbagathi County Hospital family planning clinic and 30 women seek family planning services from Clinic 66 of KNH. The clients are mainly from Nairobi and its environs, who delivered in these hospitals and are therefore visiting the clinics for family planning services as part of postnatal care or are specifically seeking family planning services. A preset of eligibility criteria as outlined in Section 3.5, was used to determine cases and controls from this study population.

## 3.5. Case and control definition

A case was defined as a woman aged 18-49 years presenting for family planning services at the study hospitals for the first time between June 2022 to September 2022 and was started on LARCs such as implants (for example Jadelle) and intrauterine devices (IUDs) (for example LNG-IUS or copper IUDs). The cases were drawn from KNH.

A control was a woman similarly defined as a case but on the day of recruitment, was started SARCs such as combined oral contraceptives (COCs) or DMPA injection. The controls were drawn from Mbagathi Sub-County Hospital.

Cases and controls were selected from different sites, which might have led to selection bias. However, they are considered to have come from the same source population because of similarity in the catchment area for the two populations and the cost of family planning services in the two facilities are similar. Furthermore, despite KNH serving as a national referral hospital for certain services like family planning, for which admission or referral is not required

due to the procedure's simplicity and capacity-building efforts at the county and sub-county levels, the selected cases were deemed representative of women from Nairobi County.

### 3.6. Inclusion and exclusion criteria

### 3.6.1. Inclusion Criteria for Cases

i.      Women between the age of 18-49 years this is because women in this age bracket are defined as women of reproductive age (WHO, 2006) and would therefore require contraceptives. Women aged 15-17 are also considered women of reproductive age but they were excluded from the study on ethical considerations of obtaining assent and consent.

i.      Started on a LARCs (IUDs/implants) on the day of recruitment

ii.     Women who are capable and willing to provide written informed consent

### 3.6.2. Exclusion Criteria for Cases

i.      Women attending the family planning clinic for permanent contraceptive options (tubal ligation or sterilization)

ii.     Women attending the clinic for discontinuation of their method of contraception

### 3.6.3. Inclusion Criteria for Controls

i.      Women between the age of 18-49 years - this is because women in this age bracket are women of reproductive age (WHO, 2006). Women aged 15-17 are also considered women of reproductive age but they were excluded from the study on ethical considerations of obtaining assent and consent.

ii.     Started on SARCs (COCs or DMPA) on the day of recruitment

iii.    Women who are capable and willing to provide written informed consent

### 3.6.4. Exclusion Criteria for Controls

i.      Women attending the family planning clinic for permanent contraceptive options (tubal ligation or sterilization)

ii.     Women attending the clinic for discontinuation of their method of contraception

### 3.7. Sample size determination and sampling strategy

### 3.7.1. Sample size determination

The sample size was calculated using Kelsey et al. formulae for case control studies (Kelsey et al., 1996):

$$n_1 = \frac{(Z\alpha + Z_\beta)^2 \, \bar{p} \, \bar{q} \, (r+1)}{r \, (p_1 - p_2)^2}$$

$$n_2 = rn_1$$

Where;

$$p_1 = \frac{p_2 \, OR}{1 + p_2 \, (OR\text{-}1)} \quad and \; \bar{p} = \frac{p_1 + rp_2}{r + 1} \quad and \; \bar{q} = 1\text{-}\bar{p}$$

$$n_1 = \frac{(1.96+0.84)2 \; (0.2667)(0.7333)(1+1)}{1(0.4164-0.2292)2} = 98.66 \text{ thus 99 cases}$$

$n_2 = (1) \, (99) = 99$ controls

Where;

$$p_1 = \frac{(0.2292)(2.4)}{1+ 0.2292(2.4\text{-}1)} = 0.4164$$

$$\bar{p} = \frac{0.4164 + (1)(0.2292)}{1 + 1} = 0.3228$$

$$\bar{q} = 1 - 0.2667 = 0.7333$$

The above notations have been defined below;

$n_1$ is the number of cases. As defined in this study this was the number of women utilizing LARCs.

$n_2$ is the number of controls. As defined in this study this was the number of women utilizing SARCs.

$p_1$ is the proportion of cases exposed. As defined in this study this was the proportion of women utilizing LARCs who did not desire more children in the future.

$p_2$ is the proportion of controls exposed. As defined in this study this was the proportion of women utilizing SARCs who did not desire more children in the future this was set at 22.92% based on a previous study done in Kenya (Ontiri et al., 2019).

$Z_\alpha$ is the critical value which specifies the two-tailed CI (Type I error ($\alpha$)= 0.05; $Z_{\alpha/2}$ = 1.96) which was set at 95%.

$Z_\beta$ is the critical value for the desired power (Type II error ($\beta$)= 0.2; $Z_{1\text{-}\beta}$ = -0.84) which was set at 80%.

OR is the measure of association between the exposure and an outcome. As defined in this study the odds of not desiring more children in the future is 2.4 times higher in those who utilize LARCs than those who utilize SARCs. This is based on a previous study conducted in Kenya (Ontiri et al., 2019).

The ratio of cases to controls was set at 1:1. Given these figures, and assuming a 5% non-response rate, the sample size required was 103 cases and 103 controls. Thus, the total sample size was 206.

### 3.7.2. Sampling strategy and recruitment

All women attending the family planning clinics were screened to determine their utilization of LARCs. All women who meet the case definition (as described in Section 3.5) were consecutively recruited as cases until the sample size of 103 cases was achieved. Controls were a systematic random sample of the women utilizing SARCs (as described in section 3.5) who were attending the study hospital on the same week of recruitment of cases. The first control was selected by lottery method. Subsequently, every second woman eligible for the study was selected from the family planning clients who visited the health facilities during the data collection period. The sampling frame was based on the number of potential participants that were seen on a day to day basis in the family planning clinics.

### 3.8. Study variables and their method of measurement

The dependent variable was method of contraception which was a binary variable denoted as LARCs use or SARCs use.

The independent variables were socio-demographic, reproductive and health facility related factors. The socio-demographic factors included age, level of education, occupation, marital status, religion, area of residence and spousal approval of contraceptive use. The reproductive factors included desire for more children, number of children, previous planned pregnancy and desired future birth interval. The health facility factors included availability of LARCs, adequacy of counselling and cost.

The independent variables were assessed as in Table 3.1.

**Table 3.1: Study Variables and their method of measurement**

| Variable (type) | Measurement of Variables |
|---|---|
| Method of contraception (nominal) | This was categorized into two the first category as LARCs which referred to use of implants (for example Jadelle) and intrauterine devices (IUDs) (for example copper IUDs) and the second category as SARCs which referred to combined oral contraceptives (COCs) or DMPA injection. |
| Age (continuous) | This was captured in years. Categorized later in the analysis as 18-28 years, 29-39 years and 40-49 years. |

| | |
|---|---|
| Level of education (ordinal) | This is the achieved educational level of the women that attend the clinics. It was divided into four levels: no education, primary incomplete, primary complete or secondary and above (KNBS, 2021). |
| Occupation (nominal) | This was assessed in three levels: wage employees, self-employed or unemployed (KNBS, 2021) |
| Religion (nominal) | This was expressed as Protestant/other Christian, Roman Catholic, Muslim, No religion or other (KNBS, 2023) |
| Marital status (nominal) | This was captured in four ways as: never married, married, living together, divorced/ separated or widowed (KNBS, 2023) |
| Area of residence (nominal) | This was captured in two ways as: urban (Nairobi) and non-urban (outside Nairobi) |
| Spousal approval (nominal) | This referred to whether the participants spouse approved their current contraceptive choice. It was expressed in two ways as yes or no. |
| Previous pregnancy (nominal) | This referred to the woman's last pregnancy. This was captured in two forms: planned or unplanned. |
| Desire to have more children (nominal) | This referred to the woman's desire to have more children and was captured as: yes, no, I don't know or it depends on my husband |
| Number of children (discrete) | This was measured as parity that is number of babies delivered. This variable was categorized later in the analysis as 1 or $\leq 2$ children. |
| History of abortion or miscarriage (nominal) | This indicated whether the participant had ever had an abortion or miscarriage and was captured as either yes or no. |
| Birth interval (continuous) | This indicated the participants future desired birth interval. It was captured in years and later categorized in the analysis as $\leq 3$ or $> 3$. |
| Cost of contraceptives (nominal) | This referred to the cost implications of uptake of contraception at the clinic. This was indicated as paid or free. |
| Availability of contraceptives (nominal) | This referred to availability of the participant's contraceptive choice at the clinic. This was expressed as available or unavailable. |

| Counselled on LARCs (nominal) | This referred to whether a healthcare provider has spoken to the study participant about different LARCs options. This will be expressed as either yes or no |
|---|---|

### 3.9. Data collection plan and instruments

Two research assistants (RAs) assisted in data collection and recruitment of participants. The two RAs (one medical student and one clinical officer) assisted with data collection in KNH and Mbagathi County Hospital, respectively. The RAs were trained by the principal investigator (PI) on the study content, ethical considerations and how to fill in the questionnaire to meet the study objectives and minimize errors that may occur in data collection.

Type of contraceptive use was ascertained by looking at the participant's medical records as the study participants were interviewed after being attended to by a health care provider. This was used to determine whether a potential participant was a case or control. Before obtaining consent (Appendices 10.1 and 10.2 in English and Kiswahili versions, respectively), the RAs presented information about the study's eligibility, purpose and procedures to the study participants. In addition, English and Kiswahili versions of the questionnaires (Appendices 10.3 and 10.4 respectively) were availed according to a participant's language preference to both cases and controls.

### 3.10. Ethical considerations

Ethical clearance from Kenyatta National Hospital-University of Nairobi Ethics Research Committee (KNH-UoN ERC) under reference number (KNH-ERC/A/167), National Commission for Science Technology and Innovation (NACOSTI) under reference number (319389) and Nairobi Metropolitan Service under reference number (EOP/NMS/HS/142) were granted before data collection (Appendices 10.5 to 10.7). Permission from the KNH and Mbagathi County Hospital administrations was acquired prior to data collection. Before beginning data collection, the goal and nature of the research was communicated to the study participants and thereafter consent sought. To ensure a quiet and private environment for administering questionnaires, a dedicated private room was utilized that was distinct from the clinic's waiting areas and other public spaces. Furthermore, in cases where participants were accompanied by their spouses, an option for a one-on-one questionnaire session was offered to guarantee privacy and promote candid responses. Additionally, it was emphasized that all responses would remain confidential and would not be disclosed to anyone, including their spouse or family members. Serial identification numbers were given for each participant to

protect the identity of the participants and their names were not used in any part of the study. To restrict access and preserve participant data, all data collected from the study participants was kept under controlled conditions that is only the PI and RAs had access to the data and the data was stored in password protected computers. The principle of beneficence was covered in that the results of the study would be expediently made available to the public through publication of the findings with the goal of promoting the well-being and interests of the study participants. The principle of justice was emphasized in that the findings of the study would inform future policies for family planning practices.

### 3.11. Data processing and analysis

The questionnaires were verified for completeness and accuracy. The validated questionnaires were then coded and entered into an Excel spreadsheet and exported to a data analysis software. All data analysis was performed using STATA version 15.0. Descriptive statistics was used to summarize demographic characteristics. Specifically, continuous variables were summarized using means, medians and range. Categorical variables were summarized using proportions and percentages.

A logistic regression was utilized in the univariable analysis to investigate the association between each predictor on the odds of LARCs use (outcome) at a p value of $P \leq 0.05$, subsequently crude odds ratios (cOR) were reported. Parity as a continuous variable was categorized into two groups that is 1 or $\geq 2$ for assessment in univariable and multivariable analysis. Cost of contraception and counselling on LARCs were also dropped from logistic regression as they perfectly predicted the data and failure, respectively.

Variables found to have a statistically significant association with the use of LARCs in the univariable analysis were analyzed in the multivariable model. In the multivariable analysis a backward step-wise approach was used to eliminate variables at $P \geq 0.05$. Nonsignificant variables were only removed from the model if their removal did not result in a change in the regression coefficient of the remaining variables by more than 30%. Two- way interactions were fitted between the remaining variables of the final model and assessed for significance. A test for interaction between age and level of education and desire to have children and level of education was done and there was no interaction. The strength of association between LARCs use and its independent variables was measured as adjusted odds ratio (AOR) using logistic regression at p<0.05. The test that was used to determine the goodness of fit of the model was the Hosmer-Lemeshow goodness of fit test, the model was considered a good fit if the p > 0.05.

### 3.12. Minimization of errors and bias

Data collection by the PI and trained RAs improved data quality and reduced information bias. Two data entry clerks extracted the data into Microsoft Excel, following which the resulting datasets were compared and amendments made as needed to minimize data entry errors and incomplete data. External validity was ensured by using an appropriate sample, using sound methodology in the study design and carrying out the research in two large referral hospitals. However, the study cannot be generalized to the entire country, rural communities or women with different socio-economic statuses. Internal validity was ensured through random and systematic sampling techniques, use of an adequate sample size, training of RAs before data collection, and reducing confounding by collecting information on all possible confounders and controlling for their effects in data analysis. Selection bias was minimized by using randomly selected study participants. Cases and controls were selected from two different sites, namely KNH and Mbagathi respectively, which might have introduced selection bias. However, it is important to note that the catchment populations of the family planning clinics in KNH and Mbagathi are similar, and due to their close geographical proximity, public nature, and comparable charges for family planning services, significant differences are not expected. Selection bias was further minimized by including cases and controls defined using similar clear inclusion and exclusion criteria (other than the type of contraceptive used). Interviewer bias was minimized by ensuring the RAs were trained before carrying out data collection and the same data collection tool was used on both cases and controls.

### 3.13. Study results dissemination plan

The results of this study will be presented to the Department of Public and Global Health, University of Nairobi as a project dissertation in partial fulfillment of the requirements for the award of the degree of Master of Public Health. The thesis will also be published in the University of Nairobi repository after approval. Abstracts will be developed from the findings for presentation in scientific conferences and a manuscript developed for publication in a peer-reviewed journals. In addition, a copy of the dissertation will be submitted to the office of the Nairobi City County's Director of Health Services. An executive summary report will also be given to KNH-UoN ERC upon completion of the study.

## 4.0. RESULTS

### 4.1. Introduction

This chapter reports the findings of the study. The chapter begins by reporting background characteristics of the study participants. This is followed by a report of the findings based on the study objectives. Risk factors associated with use of LARCs were determined using logistic regression analyses.

### 4.2. Socio-demographic characteristics of the study participants

A total of 206 study participants (103 cases and 103 controls) were enrolled in this study. Twelve of these participants (6 cases and 6 controls) declined consent (response proportion = 97.1% for each arm). Accordingly, the eligible study participants were 194 (97 cases and 97 controls). Among cases, 41 (21.13%) were on implants and 56 (28.87%) on IUDs. Among controls, 27 (13.92%) were on COCs and 70 (36.08%) were on DMPA. Figure 4.1 displays the study enrollment and recruitment process.
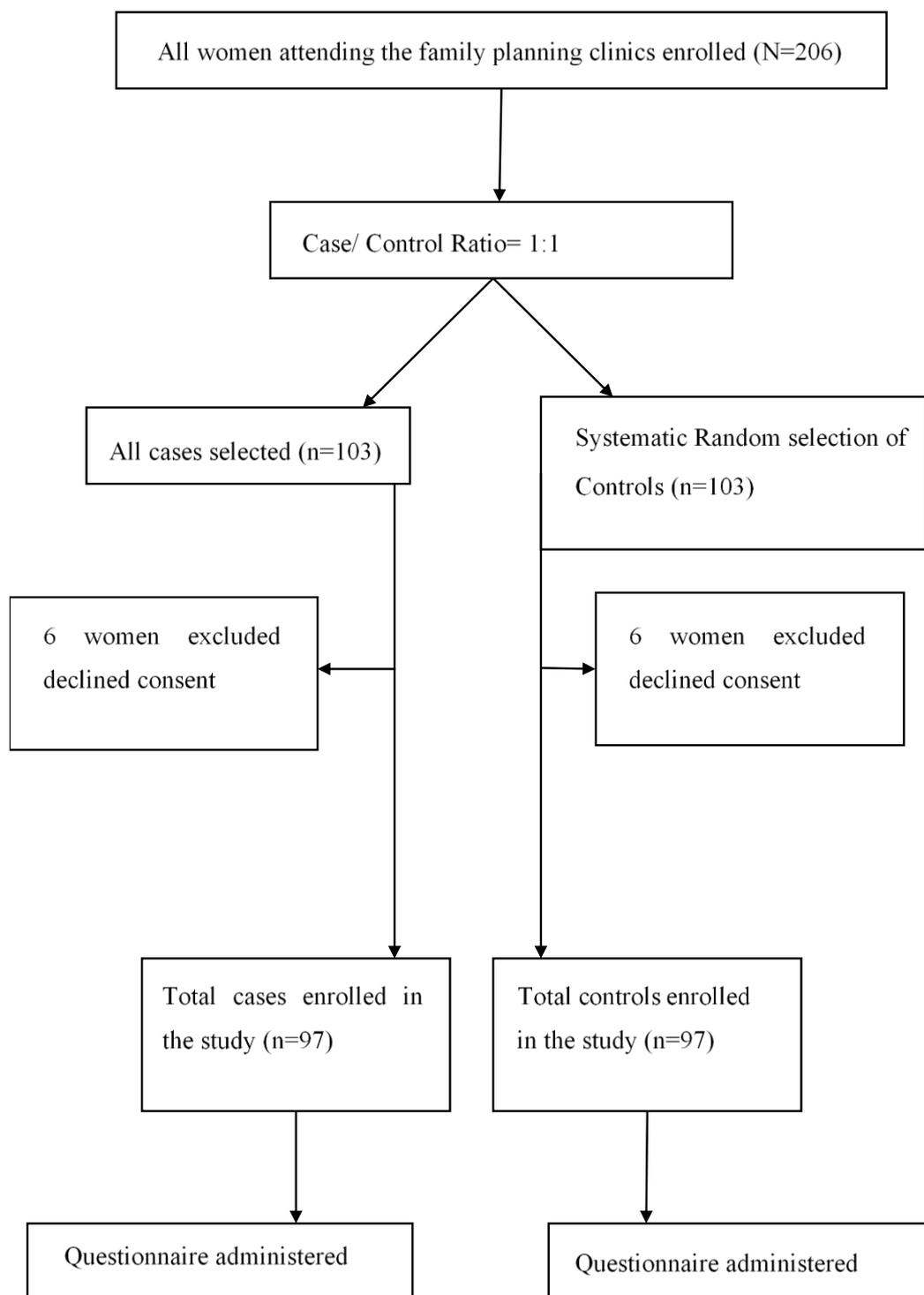
**Figure 4.1: Study flow chart of factors associated with use of long-acting reversible contraceptives among women attending two referral hospitals in Nairobi County, Kenya between June and September 2022**

Table 4.1 presents the socio-demographic characteristics of the study participants.

The median age of the study participants was 30. The median age of cases was 36, whereas in the control group the median age was 28. Majority of the participants were married 173 (89.18%); 88 (90.72%) and 85 (87.63%) in the case and control group, respectively. More than three-quarters of the study participants had secondary education and above 163 (84.02%) with the cases having a higher proportion (91.75%; n=89) compared to controls (76.29%; n=74). In regards to spousal approval 84.54% (n=164) received spousal approval and comprised (85.57%; n=83) in the case group and (83.51%; n=81) in the control group.

**Table 4.1. Socio-demographic characteristics of study participants**

| Variable | Category | All women attending the family planning clinics | Cases | Controls |
|---|---|---|---|---|
| | | No. (%) | No. (%) | No. (%) |
| Age (Years) (N=194) | 18-28 | 77 (39.69) | 26 (26.80) | 51 (52.58) |
| | 29-39 | 85 (43.81) | 46 (47.42) | 39 (40.21) |
| | 40-49 | 32 (16.49) | 25 (25.77) | 07 (7.22) |
| Median | | | 30 | 36 | 28 |
| Marital status (N=194) | Never married | 13 (6.70) | 05 (5.15) | 08 (8.25) |
| | Married | 173 (89.18) | 88 (90.72) | 85 (87.63) |
| | Living Together | 02 (1.03) | 01 (1.03) | 01 (1.03) |
| | Divorced/ Separated | 05 (2.58) | 02 (2.06) | 03 (3.09) |
| | Widowed | 01 (0.52) | 01 (1.03) | - - |
| Level of education (N=194) | No education | 01 (0.52) | - - | 01 (1.03) |
| | Primary incomplete | 05 (2.58) | 01 (1.03) | 04 (4.12) |
| | Primary complete | 25 (12.89) | 07 (7.22) | 18 (18.56) |
| | Secondary and above | 163 (84.02) | 89 (91.75) | 74 (76.29) |
| Religion (N=194) | Protestant/ other Christian | 132 (68.04) | 64 (65.98) | 68 (70.10) |
| | Roman Catholic | 54 (27.84) | 30 (30.93) | 24 (24.74) |
| | Muslim | 03 (1.55) | 03 (3.09) | - - |
| | No religion | 05 (2.58) | - - | 05 (5.15) |
| Occupation (N=194) | Wage employees | 87 (44.85) | 54 (55.67) | 33 (34.02) |
| | Self- employed | 39 (20.10) | 24 (24.74) | 15 (15.46) |
| | Unemployed | 68 (35.05) | 19 (19.59) | 49 (50.52) |
| Place of residence (N=194) | Urban | 162 (83.51) | 74 (76.29) | 88 (90.72) |
| | Non-urban | 32 (16.49) | 23 (23.71) | 09 (9.28) |
| Spousal Approval (N=194) | Yes | 164 (84.54) | 83 (85.57) | 81 (83.51) |
| | No | 30 (15.46) | 14 (14.43) | 16 (16.49) |
| | | | | |

## 4.3. Reproductive characteristics of study participants

The median parity of all study participants was 2. Similarly, the median parity of cases was 2, whereas in the control group the median parity was 2. Out of the 194 study participants, 98 (50.52%) desired to have children in the future, of which 38 (39.18%) were cases and 60 (61.86%) were controls. Of the 98 who desired to have children in the future the median future desired birth interval of the respondents was 4.5 years. The median future desired birth interval of cases was 3.00 years whereas in the control group the median future desired birth interval

was 5.00 years. The reproductive characteristics of the study respondents are displayed in Table 4.2

**Table 4.2: Reproductive characteristics of study participants**

| Variable | Category | All women attending the family planning clinics | Cases | Controls |
|---|---|---|---|---|
| | | No. (%) | No. (%) | No. (%) |
| Number of children (N=194) | 1 | 66 (34.02) | 33 (34.02) | 33 (34.02) |
| | ≥ 2 | 128 (65.98) | 64 (65.98) | 64 (65.98) |
| Median | - | 2 | 2 | 2 |
| Desire to have children in the future (N=194) | Yes | 98 (50.52) | 38 (39.18) | 60 (61.86) |
| | No | 79 (40.72) | 51 (52.58) | 28 (28.87) |
| | I don't know | 16 (8.25) | 8 (8.25) | 8 (8.25) |
| | It depends on my husband | 1 (0.52) | 0 (0.0) | 1 (1.03) |
| Future desired birth interval (N=98) | ≤ 3 | 38 (38.78) | 17 (28.33) | 21 (55.26) |
| | >3 | 60 (61.22) | 43 (71.67) | 17 (44.74) |
| Median | - | 4.50 | 3.00 | 5.00 |
| Nature of last pregnancy (N=194) | Planned | 109 (56.19) | 63 (64.95) | 46 (47.42) |
| | Unplanned | 85 (43.81) | 34 (35.05) | 51 (52.58) |
| Miscarriage/ Abortion (N=194) | Yes | 54 (27.84) | 26 (26.80) | 28 (28.87) |
| | No | 140 (72.16) | 71 (73.20) | 69 (71.13) |

## 4.4. Health-facility related characteristics of study participants

Table 4. 3 shows the health-facility related characteristics of the study participants. Distinctively, all cases paid for their choice of contraception while all controls received their contraception for free.

**Table 4.3: Health-facility related characteristics of study participants**

| Variable | Category | All women attending the family planning clinics | Cases | Controls |
|---|---|---|---|---|
| | | No. (%) | No. (%) | No. (%) |
| Cost of contraception (N=194) | Paid | 97 (50.0) | 97 (100.0) | - - |
| | Free | 97 (50.00) | - - | 97 (100.0) |
| Counselled on LARCs (N=194) | Yes | 146 (75.26) | 97 (100.00) | 49 (50.52) |
| | No | 48 (24.74) | - - | 48 (49.48) |
| Availability of contraceptives (N=194) | Available | 149 (76.80) | 78 (80.41) | 71 (73.20) |
| | Unavailable | 45 (23.20) | 19 (19.59) | 26 (26.80) |

## 4.5. Results of Univariable logistic regression analyses

## 4.5.1. Results of Univariable logistic regression analyses for the socio-demographic factors

The crude association between the socio-demographic factors and use of LARCs is captured in Table 4.4. In the univariable logistic regression analyses, age, level of education, occupation and place of residence were the sociodemographic factors found to be statistically significantly associated with use of LARCs. There was a gradual pattern concerning women's age; the age groups 29-39 years (cOR=2.31; 95% CI:1.22-4.37), and 40-49 years (cOR=7.02; 95% CI:2.68-18.33), were statistically significantly associated with higher odds of utilization of LARCs compared to those aged 18-29 years. Women who possessed secondary education and above were more likely to utilize LARCs (cOR=3.46; 95 CI:1.46-8.18) as compared to women who possessed no education or primary education. Participants who were wage employed or self-employed had greater odds of utilizing LARCs (cOR=4.22; 95 CI:2.13-8.36) and (cOR=4.13; 95 CI:1.79-9.51), respectively compared to those who were unemployed. Women residing in non-urban areas (outside Nairobi) had three times greater odds of utilizing LARCs as compared to those who reside in urban areas (Nairobi) (cOR=3.04; 95 CI:1.32-6.97)

**Table 4.4: Univariable analysis of the socio-demographic factors associated with use of long-acting reversible contraceptives among women attending two referral hospitals in Nairobi County, Kenya between June and September 2022**

| Variable | Value | Cases | Controls | | Univariable analysis | | |
|---|---|---|---|---|---|---|---|
| | | No. (%) | No. (%) | cOR | 95 CI | | p value |
| | | | | | Lower | Upper | |
| Age [*] | 18-28 | 26 (26.80) | 51 (52.58) | Reference | - | - | - |
| | 29-39[*] | 46 (47.42) | 39 (40.21) | 2.31 | 1.22 | 4.37 | 0.010 |
| | 40-49[*] | 25 (25.77) | 07 (7.22) | 7.02 | 2.68 | 18.33 | <0.001 |
| Marital status | Never married | 5 (5.15) | 8 (8.25) | Reference | - | - | - |
| | Married | 88 (90.72) | 85 (87.63) | 1.66 | 0.52 | 5.27 | 0.392 |
| | Others | 4 (4.12) | 4 (4.12) | 1.60 | 0.27 | 9.49 | 0.605 |
| Level of education [*] | No education or Primary education | 8 (8.25) | 23 (23.71) | Reference | - | - | - |
| | Secondary and above[*] | 89 (91.75) | 74 (76.29) | 3.46 | 1.46 | 8.18 | 0.005 |
| Religion | Protestant/ other Christian | 64 (65.98) | 68 (70.10) | Reference | - | - | - |
| | Roman Catholic | 30 (30.93) | 24 (24.74) | 1.33 | 0.70 | 2.51 | 0.382 |
| | Other | 3 (3.09) | 5 (5.15) | 0.64 | 0.15 | 2.78 | 0.549 |
| Occupation* | Unemployed | 19 (19.59) | 49 (50.52) | Reference | - | - | - |
| | Self-employed[*] | 24 (24.74) | 15 (15.46) | 4.13 | 1.79 | 9.51 | 0.001 |
| | Wage employees[*] | 54 (55.67) | 33 (34.02) | 4.22 | 2.13 | 8.36 | <0.001 |
| Place of residence* | Urban | 74 (76.29) | 88 (90.72) | Reference | - | - | - |
| | Non-urban[*] | 23 (23.71) | 9 (9.28) | 3.04 | 1.32 | 6.97 | 0.009 |
| Spousal Approval | No | 14 (14.43) | 16 (16.49) | Reference | - | - | - |
| | Yes | 83 (85.57) | 81 (83.51) | 1.17 | 0.54 | 2.55 | 0.691 |

[*]Variables were eligible for inclusion in the multivariable model (P≤ 0.05)

### 4.5.2. Results of univariable logistic regression analyses for reproductive factors

In regards to reproductive factors, desire to have children, future desired birth interval and nature of last pregnancy registered statistically significant associations with the use of LARCs in the univariable logistic regression analyses (Table 4.5). Women who desired to have children in the future had lower odds of utilization of LARCs (cOR=0.34; 95 CI:0.19-0.64). Compared to participants whose desired future interval was ≥ 3, those whose desired birth interval was ≤ 3 had 3.12 the odds of using LARCs (cOR=312; 95 CI: 1.33-7.32). The odds of using LARCs for women whose last pregnancy was unplanned compared to those that had planned pregnancies was 0.49 (cOR=0.49; 95 CI: 0.27-0.87).

**Table 4.5: Univariable analysis of reproductive factors associated with use of long-acting reversible contraceptives among women attending two referral hospitals in Nairobi County, Kenya between June and September 2022**

| Variable | Value | Cases | Controls | Univariable analysis | | | |
|---|---|---|---|---|---|---|---|
| | | No. (%) | No. (%) | cOR | 95 CI | | p value |
| | | | | | Lower | Upper | |
| **Number of children** | 1 | 33 (34.02) | 34 (34.02) | Reference | - | - | - |
| | ≥ 2 | 64 (65.98) | 64 (65.98) | 1.00 | 0.55 | 1.81 | 1.000 |
| **Desire to have children*** | No | 51 (52.58) | 28 (28.87) | Reference | - | - | - |
| | Yes* | 38 (39.18) | 60 (61.86) | 0.34 | 0.19 | 0.64 | 0.001 |
| | Others | 8 (8.25) | 9 (9.28) | 0.49 | 0.17 | 1.41 | 0.184 |
| **Nature of last pregnancy*** | Planned | 63 (64.95) | 46 (47.42) | Reference | - | - | - |
| | Unplanned* | 34 (35.05) | 51 (52.58) | 0.49 | 0.27 | 0.87 | 0.014 |
| **Miscarriage/ Abortion** | No | 71 (73.20) | 69 (71.13) | Reference | - | - | - |
| | Yes | 26 (26.80) | 28 (28.87) | 0.90 | 0.48 | 1.69 | 0.749 |
| **Future desired birth interval*** | ≥ 3 | 43 (71.67) | 17 (44.74) | Reference | - | - | - |
| | ≤ 3* | 17 (28.33) | 21 (55.26) | 3.12 | 1.33 | 7.32 | 0.009 |

*Variables were eligible for inclusion in the multivariable model (P≤ 0.05)

### 4.5.3. Results of Univariable logistic regression analyses for the health facility factors

The cost of contraceptives perfectly predicted whether one was on LARCs or SARCs; all cases paid for the contraceptives, whereas all controls did not pay. All cases (women on LARCs) were counselled on use of contraceptives, whereas only 50.52% (49/97) of women on SARCs (controls) were counselled. Availability of contraceptives was not statistically significantly associated with use of LARCs (cOR = 0.67; 95% CI = 0.34-1.30; P = 0.233)

### 4.6. Results of Multivariable regression analyses

The Hosmer- Lemeshow test indicated that the model had a good fit (Pearson chi-square=5.29, P value=0.727)

### 4.6.1. Results of multivariable logistic regression analyses for the socio-demographic factors

In the univariable logistic regression analyses, age, level of education, occupation and place of residence were the sociodemographic factors found to be statistically significantly associated with use of LARCs (Table 4.4), these variables were subsequently analyzed in the multivariable model. From the multivariable analysis, in regards to socio-demographic characteristics only level of education and occupation were shown to be statistically significant predictors of use of LARCs at 5% significance level (Table 4.6).

Compared to participants who were unemployed, those who were wage employed were 3.87 times likely to use LARCs (aOR=3.87; 95 CI:1.78-8.40) holding their age, level of education, place of residence, desire to have children and nature of last pregnancy constant. Self-employed respondents had 3.51 times the odds of using LARCs (aOR=3.51; 95 CI:1.36-9.07) as unemployed participants regardless of their age, level of education, place of residence, desire to have children and nature of last pregnancy. Participants who had secondary and above education had 4.12 times the odds of using LARCs (aOR=4.12; 95 CI:1.51-11.21) compared to those who had no education and primary education regardless of their age, level of education, place of residence, desire to have children and nature of last pregnancy. Although marginally non-significant women aged 40-49 years had increased odds of using LARCs (aOR=3.29; 95 CI:0.98-11.10).

**Table 4.6: Multivariable analysis of the socio-demographic factors associated with use of long-acting reversible contraceptives among women attending two referral hospitals in Nairobi County, Kenya between June and September 2022**

| Variable | Value | Cases n (%) | Controls n (%) | Multivariable analysis | | | |
|---|---|---|---|---|---|---|---|
| | | No. (%) | No (%) | aOR | 95 CI | | p value |
| | | | | | Lower | Upper | |
| **Age** | 18-28 | 26 (26.80) | 51 (52.58) | Reference | - | - | - |
| | 29-39 | 46 (47.42) | 39 (40.21) | 1.62 | 0.78 | 3.37 | 0.192 |
| | 40-49 | 25 (25.77) | 07 (7.22) | 3.29 | 0.98 | 11.10 | 0.055 |
| **Level of education** * | No education or Primary education | 8 (8.25) | 23 (23.71) | Reference | - | - | - |
| | Secondary and above* | 89 (91.75) | 74 (76.29) | 4.12 | 1.51 | 11.21 | 0.006 |
| **Occupation*** | Unemployed | 19 (19.59) | 49 (50.52) | Reference | - | - | - |
| | Self-employed* | 24 (24.74) | 15 (15.46) | 3.51 | 1.36 | 9.07 | 0.009 |
| | Wage employees* | 54 (55.67) | 33 (34.02) | 3.87 | 1.78 | 8.40 | 0.001 |
| **Place of residence** | Urban | 74 (76.29) | 88 (90.72) | Reference | - | - | - |
| | Non-urban | 23 (23.71) | 9 (9.28) | 2.05 | 0.79 | 5.36 | 0.141 |

*Variables that were statistically significant at 5% significance level

### 4.6.2. Results of Multivariable logistic regression analyses for the reproductive factors

Desire to have children, future desired birth interval and nature of last pregnancy were the two reproductive factors found to be statistically significant in the univariable logistic regression (Table 4.5), these variables were subsequently analyzed in the multivariable model. After controlling for the other variables in the multivariable analysis the variables desire to have children and future desired birth interval were shown to be statistically significant predictors of use of LARCs at 5% significance level (Table 4.8). Compared to women who did not desire to have children in the future women who desired to have children in the future were 64% less likely to use LARCs (aOR=0.36; 95 CI:0.16-0.80). Participants who had less ≤ 3 years future desired birth interval had 2.94 times the odds of using LARCs (aOR=2.94; 95 CI:1.15-7.50) compared to those who had a future desired birth interval of > 3 years.

**Table 4.7: Multivariable analysis of the reproductive factors associated with use of long-acting reversible contraceptives among women attending two referral hospitals in Nairobi County, Kenya between June and September 2022**

| Variable | Value | Cases | Controls | Multivariable analysis | | | |
|---|---|---|---|---|---|---|---|
| | | No. (%) | No. (%) | aOR | 95 CI | | p value |
| | | | | | Lower | Upper | |
| **Desire to have children** | No | 51 (52.58) | 28 (28.87) | Reference | - | - | - |
| | Yes[*] | 38 (39.18) | 60 (61.86) | 0.36 | 0.16 | 0.80 | 0.012 |
| | Others | 8 (8.25) | 9 (9.28) | 0.49 | 0.14 | 1.68 | 0.257 |
| **Nature of last pregnancy** | Planned | 63 (64.95) | 46 (47.42) | Reference | - | - | - |
| | Unplanned | 34 (35.05) | 51 (52.58) | 0.52 | 0.27 | 1.04 | 0.064 |
| **Future desired birth interval** | >3 | 43 (71.67) | 17 (44.74) | Reference | - | - | - |
| | ≤ 3[*] | 17 (28.33) | 21 (55.26) | 2.94 | 1.15 | 7.50 | 0.024 |

[*]Variables that were statistically significant at 5% significance level

## 5.0. DISCUSSION

### 5.1. Introduction

This study's aim was to determine factors associated with use of LARCs among women seeking family planning services at two referral hospitals in Nairobi County, Kenya specifically the socio-demographic, reproductive and health facility factors. In this section the study findings are contextualized and displayed based on study objectives.

### 5.2. Factors associated with use of LARCs

### 5.2.1. Socio-demographic factors

In this study, socio-demographic factors such as level of education and occupation were found to contribute significantly to use of LARCs.

### 5.2.1.1. Level of education

In this study, women with secondary education and above compared to those who possessed no education or primary education were 4.12 times more likely to use LARCs. Prior studies in Kenya, specifically conducted in Kakamega County, and in Ethiopia have confirmed this finding as well (Fekadu et al., 2017; Ontiri et al., 2019). This explanation is plausible as women who have more education are more likely to conduct research on contraceptive options and even suggest to the health care provider a LARCs choice (Tibaijuka et al., 2017). It is conceivable that women who are more educated may be aware that use of SARCs is associated with higher likelihood of unplanned pregnancies and related challenges, and therefore may choose to use LARCs instead. However our study results do not match with those conducted in Indonesia where no significant association was found with level of education and use of LARCs (Harzif et al., 2019). The differences in study design may explain the inconsistency in the findings of the two studies.

### 5.2.1.2. Occupation

There was a statistically significant association between occupation and use of LARCs. Use of LARCs was significantly higher among wage employed (aOR=3.87; 95 CI:1.78-8.40; p=0.001) and self-employed (aOR=3.51; 95 CI:1.36-9.07; p=0.009) respondents compared to unemployed participants. These findings suggest that unemployment may be a barrier to utilization of LARCs. Previous studies in different parts of Ethiopia have also supported this finding (Gujo & Kare, 2021; Melka et al., 2015; Yohannes Dibaba et al., 2019). This finding could be explained by results from a decomposition analysis conducted in SSA. The study sought to assess the socioeconomic inequalities in utilization of modern contraceptives and

discovered that utilization of modern contraceptives was more concentrated in rich households that have access to a source of income (Fentie et al., 2023). Whereas this current study reports a significant association between occupation and use of LARCs, a study in France reported contrary findings which could possibly be explained by 100% cost coverage from the National Health Insurance System for all LARC methods thus employment status did not matter (Moreau et al., 2013).

### 5.2.1.3. Age

Even though the results were non-significant, women aged 40-49 years compared to younger women aged 18-28 years exhibited elevated odds of utilizing LARCs. Studies conducted in USA, Indonesia and Kenya have found age to be a significant factor of use of LARCs (Dempsey et al., 2012; Gayatri, 2020; Kungu et al., 2020). It is possible that younger women have not completed their family size thus prefer to use SARCs to space out their pregnancies in the short-term and delay pregnancy as opposed to using LARCs whose duration of use ranges from three to ten years and could be preferred by older women who have completed their family size (Bhandari et al., 2019). Another possible explanation would be that some younger women have various myths and misconceptions about LARCs especially around fertility and use of LARCs especially as a nulliparous woman thus preferring to use SARCs or natural methods (S.P. et al., 2017). However, our study contradicts those conducted in USA and Ethiopia (B & D, 2017; Kavanaugh et al., 2015). Contrary findings could be explained by the fact that potential confounders such as cost, adequacy of counselling and availability of contraceptives were not measured in these studies, but were measured in our study. Additionally, other studies found that use of LARCs was the same across age groups (Abraham et al., 2015). The substantial sample size of more than 6,000 participants provides an explanation for this finding.

### 5.2.1.4. Place of residence

Our results indicated that place of residence whether urban (within Nairobi) or non-urban (outside Nairobi) was not a significant predictor of utilization of LARCs. The result might have been affected by the lower sample size of women who resided in the non-urban regions compared to urban regions. Past studies have investigated and reported significant (Boah et al., 2022) and non-significant (Bolarinwa et al., 2021; Gayatri, 2020; Gujo & Kare, 2021) associations between place of residence and utilization of LARCs.

### 5.2.2. Reproductive factors

Among the reproductive factors studied, desire to have children and future desired birth interval were found to be significantly associated with use of LARCs. However, nature of last

pregnancy registered significant associations with the use of LARCs in the univariable logistic regression analyses only.

### 5.2.2.1. Desire to have children

Our study found that women who expressed a desire to have children in the future were 64% less likely to use LARCs compared to those who did not desire future children. This is in agreement with a study conducted in Kakamega County, Kenya which found that women who did not desire children were four times more likely to utilize LARCs as compared to those that desired more children in the future (Ontiri et al., 2019). A possible explanation for this is that women who did not desire children opted for LARCs instead of permanent methods such as female sterilization whose prevalence in Kenya stand at 2.3% and 0.5 % for married women and sexually active but unmarried women, respectively (KNBS, 2023). In contrast, another study conducted in Uganda found that desire for more children had no significant association with LARCs use in the extended postpartum period (Anguzu et al., 2018). A possible explanation for this could be a high rate of unmet family planning needs in this region.

### 5.2.2.2. Nature of last pregnancy

Nature of last pregnancy (that is, whether it was planned or unplanned) did not significantly predict utilization of LARCs taking into account the effect of other variables. These findings are similar to a multi-country study conducted in Malawi, South Africa, Uganda and Zimbabwe (Aizire et al., 2022). Although the nature of a person's previous pregnancy might impact their attitude towards LARCs, it may not be the sole determining factor for their decision to utilize LARCs (Anguzu et al., 2014). A study conducted in the USA produced comparable results to our own study, significant findings in the univariable analysis but insignificant results in the multivariable analysis. This could be explained by the presence of other important variables that predict the utilization of LARCs such as preconceived misconceptions of invasiveness that were not assessed in our or this study (Coates et al., 2018; Dempsey et al., 2012). On the other hand, some studies have yielded conflicting results, indicating that women with a history of unintended pregnancies are more likely to use LARCs (Oduyebo et al., 2019). This could be due to the fact that these women were highly motivated to use methods that are the most effective at reducing unintended pregnancies (Winner et al., 2012). Additionally, pregnancies that were not planned usually come with emotional, financial and social stress thus women may choose to use methods that will guarantee prevention of pregnancy (Lewinsohn et al., 2018).

### 5.2.3. Health facility factors

In our study, cost of contraceptives perfectly predicted whether one used LARCs or SARCs. Out of pocket cost of contraception has been shown to be a significant factor associated with utilization of LARCs such as IUDs (Gariepy et al., 2011). According to a study conducted on women seeking abortion services, almost a quarter of them stated that the reason they were not using any form of contraception to prevent pregnancy was due to its cost (Homco et al., 2011). A program aimed at enhancing family planning services and promoting use of LARCs found that by eliminating cost barriers there was a 218% increase in users opting for IUDs and a staggering 829% increase in the number of implant users (Udeh et al., 2009). In our study all LARCs involved a cost and all SARCs were free.

In our study all LARC users (referred to as "cases") received counselling on LARCs, whereas about 50% of SARC users were counselled on LARCs. According to a study conducted in southern Ethiopia, women who had a discussion about LARCs with their healthcare providers were 4.1 times more likely to use them compared to those who did not have such a discussion (Tilahun et al., 2020). Furthermore, a study conducted in Mozambique found that health care providers were three times more likely to discuss SARCs methods such as injectable and pills than LARCs with women seeking family planning services (Galle et al., 2018). Additionally, during a qualitative study conducted in Kenya to explore the utilization of LARCs, particularly LNG-IUS use among educated women, it was observed that participants who received advice and encouragement from their healthcare providers were more likely to choose LARCs, specifically LNG-IUS (G. Nanda et al., 2018). Altogether these findings highlight the well-known fact that healthcare provider information and counselling greatly affect the choice and utilization of reproductive services such as LARCs.

A mixed method study carried out in Uganda found that LARCs availability at healthcare facilities affected their usage. As a result of inadequate information on their availability, individuals resorted to readily available options like condoms and pills. Clients waited for radio announcements to learn about LARCs availability, indicating their dependence on such information (Tibaijuka et al., 2017). A similar observation was made in a Mozambique study, where one-third of the participants could not access their preferred contraceptive method due to its unavailability at the facility during their visit (Galle et al., 2018). Delayed patient care due to lengthy mail delivery service times for LARCs, discovered by a study at a rural health centre in USA, impacted contraceptive choices (Janiak et al., 2018). The findings obtained in

our study could be due to the limited amount of data in women whose contraceptive choice was unavailable at the health facility.

## 5.3. Limitations of the study

Since the study was limited to family planning services provided at only two government health care facilities, its findings may not accurately reflect the views and experiences of the general population or of those who seek family planning services at private health care facilities. Additionally, since our research was quantitative in nature an in-depth exploration of individuals' attitudes, beliefs, and experiences was not possible as this required qualitative research that is able to explore the complex socio-cultural, economic and behavioral factors that influence women's decisions to utilize LARCs. It is also possible that cases and controls were not from the same source population because they were recruited from different facilities. This may have introduced selection bias. However, since the catchment population for KNH family planning clinic and that of Mbagathi is almost similar, the effect on the findings should be minimal. Lastly, the findings of the study should be interpreted with caution as medical conditions such as diabetes mellitus, hypertension, history of severe cardiovascular diseases, superficial venous disorders and pelvic inflammatory disease among others may have confounded the findings.

## 6.0. CONCLUSION AND RECOMMENDATIONS

### 6.1. Introduction

This chapter outlines the concluding statements in line with the specific objectives. As a way to enhance the utilization of LARCs in public hospitals in Kenya, this chapter includes a set of recommendations.

### 6.2. Conclusion

The study revealed that socio-demographic factors such as education level and occupation had a significant impact on the utilization of LARCs. Unemployed participants were less likely to use LARCs compared to wage and self-employed individuals. Women with a primary level of education or lower had a statistically significantly lower odds of using LARCs compared to those with a secondary education level or higher. Additionally, women who expressed a desire to have children in the future were statistically significantly less likely to use LARCs compared to those who did not desire future children.

### 6.3. Recommendations

Based on the study findings, several recommendations can be made to improve the utilization of LARCs:

1. Tailored interventions should be developed to target women with lower education levels, with the aim of increasing awareness and improving access to LARCs.

2. Given that unemployed women were less likely to use LARCs, efforts should be made to increase accessibility and affordability of LARCs to this population, including targeted subsidies and free cost as is the case for SARCs options in the public health facilities.

3. Qualitative research should be conducted to explore the reasons behind the socio-demographic disparities in utilization of LARCs. Additionally, studies should explore the potential impact of subsidies at improving access to LARCs among unemployed and or those with lower education levels.

## 8.0. REFERENCES

Abera, R., Kote, M., Shegaze, M., Andarge, E., & Hussen, S. (2020). Determinants of Implant Utilization among Married Women of Childbearing Age in Chencha Town, Southern Ethiopia, 2017: A Case-Control Study. *BioMed Research International*, *2020*. https://doi.org/10.1155/2020/4324382

Abraham, M., Zhao, Q., & Peipert, J. F. (2015). Young age, nulliparity, and continuation of long-acting reversible contraceptive methods. *Obstetrics and Gynecology*, *126*(4), 823–829. https://doi.org/10.1097/AOG.0000000000001036

Achwoka, D., Pintye, J., McGrath, C. J., John, K., Unger, J. A., Obudho, N. Langat, A., John-Stewart, G., & Drake, A. L. (2018). women in Kenya : results from a national cross-sectional survey. *Contraception*, *97*(3), 227–235. https://doi.org/10.1016/j.contraception.2017.10.001.Uptake

Adedini, S. A., Babalola, S., Ibeawuchi, C., Omotoso, O., Akiode, A., & Odeku, M. (2018). Role of religious leaders in promoting contraceptive use in Nigeria: Evidence from the Nigerian Urban reproductive health initiative. *Global Health Science and Practice*, *6*(3), 500–514. https://doi.org/10.9745/GHSP-D-18-00135

Adedini, S. A., Omisakin, O. A., & Somefun, O. D. (2019). Trends, patterns and determinants of long-acting reversible methods of contraception among women in sub-Saharan Africa. *PLoS ONE*, *14*(6), 1–16. https://doi.org/10.1371/journal.pone.0217574

Adjei, K. K., Laar, A. K., Narh, C. T., Abdulai, M. A., Newton, S., Owusu-Agyei, S., & Adjei, S. (2015). A comparative study on the availability of modern contraceptives in public and private health facilities in a peri-urban community in Ghana. *Reproductive Health*, *12*(1), 1–8. https://doi.org/10.1186/s12978-015-0058-z

Aizire, J., Yende-Zuma, N., Sherika, H., Nematadzira, T., Nyati, M., Sufia, D., & Chinula, L. (2022). *Unintended Pregnancy and Contraception among African women living with HIV : baseline analysis of the multi-country US PEPFAR PROMOTE cohort*. 1–15.

Ajong, A. B., Njotang, P. N., Kenfack, B., Essi, M. J., Yakum, M. N., Iballa, F. B. S., & Mbu, E. R. (2018). Contraceptive method mix and preference: A focus on long acting reversible contraception in Urban Cameroon. *PLoS ONE*, *13*(8), 1–10. https://doi.org/10.1371/journal.pone.0202967

Ampt, F. H., Lim, M. S. C., Agius, P. A., Chersich, M. F., Manguro, G., Gichuki, C. M., Stoové, M., Temmerman, M., Jaoko, W., Hellard, M., Gichangi, P., & Luchters, S. (2019). Use of long-acting reversible contraception in a cluster-random sample of female sex workers in

Kenya. *International Journal of Gynecology and Obstetrics*, *146*(2), 184–191. https://doi.org/10.1002/ijgo.12862

Anguzu, R., Sempeera, H., & Sekandi, J. N. (2018). High parity predicts use of long-acting reversible contraceptives in the extended postpartum period among women in rural Uganda. *Contraception and Reproductive Medicine*, *3*(1), 1–7. https://doi.org/10.1186/s40834-018-0059-8

Anguzu, R., Tweheyo, R., Sekandi, J. N., Zalwango, V., Muhumuza, C., Tusiime, S., & Serwadda, D. (2014). Knowledge and attitudes towards use of long acting reversible contraceptives among women of reproductive age in Lubaga division, Kampala district, Uganda. *BMC Research Notes*, *7*(1), 1–9. https://doi.org/10.1186/1756-0500-7-153

Aregay, W., Azale, T., Sisay, M., & Gonete, K. A. (2018). Utilization of long acting reversible contraceptive methods and associated factors among female college students in Gondar town, northwest Ethiopia, 2018: Institutional based cross-sectional study. *BMC Research Notes*, *11*(1), 11–16. https://doi.org/10.1186/s13104-018-3971-8

B, T., & D, W. (2017). Prevalence, Perceptions and Factors Contributing to Long Acting Reversible Contraception Use among Family Planning Clients, Jimma Town, Oromiya Region, South-West Ethiopia. *Journal of Women's Health Care*, *06*(01), 1–10. https://doi.org/10.4172/2167-0420.1000351

Bahamondes, L., Bottura, B. F., Bahamondes, M. V., Gonçalves, M. P., Correia, V. M., Espejo-Arce, X., Sousa, M. H., Monteiro, I., & Fernandes, A. (2014). Estimated disability-adjusted life years averted by long-term provision of long acting contraceptive methods in a Brazilian clinic. *Human Reproduction*, *29*(10), 2163–2170. https://doi.org/10.1093/humrep/deu191

Bearak, J., Popinchalk, A., Ganatra, B., Moller, A. B., Tunçalp, Ö., Beavin, C., Kwok, L., & Alkema, L. (2020). Unintended pregnancy and abortion by income, region, and the legal status of abortion: estimates from a comprehensive model for 1990–2019. *The Lancet Global Health*, *8*(9), e1152–e1161. https://doi.org/10.1016/S2214-109X(20)30315-6

Bellizzi, S., Mannava, P., Nagai, M., & Sobel, H. L. (2020). Reasons for discontinuation of contraception among women with a current unintended pregnancy in 36 low and middle-income countries. *Contraception*, *101*(1), 26–33. https://doi.org/10.1016/j.contraception.2019.09.006

Bhandari, R., Pokhrel, K. N., Gabrielle, N., & Amatya, A. (2019). Long acting reversible contraception use and associated factors among married women of reproductive age in

Nepal. *PLoS ONE*, *14*(3), 1–13. https://doi.org/10.1371/journal.pone.0214590

Birgisson, N. E., Zhao, Q., Secura, G. M., Madden, T., & Peipert, J. F. (2015). Preventing unintended pregnancy: The contraceptive CHOICE project in review. *Journal of Women's Health*, *24*(5), 349–353. https://doi.org/10.1089/jwh.2015.5191

Boah, M., Issah, A. N., Demuyakor, I., & Hyzam, D. (2022). Long-acting reversible contraceptives utilization and its determinants among married Yemeni women of childbearing age who no longer want children. *Medicine (United States)*, *101*(40), E30717. https://doi.org/10.1097/MD.0000000000030717

Bolarinwa, O. A., Nwagbara, U. I., Okyere, J., Ahinkorah, B. O., Seidu, A.-A., Ameyaw, E. K., & Igharo, V. (2021). Prevalence and predictors of long-acting reversible contraceptive use among sexually active women in 26 sub-Saharan African countries. *International Health*, *August*. https://doi.org/10.1093/inthealth/ihab053

Bracken, J., & Graham, C. A. (2014). Young women's attitudes towards, and experiences of, long-acting reversible contraceptives. *European Journal of Contraception and Reproductive Health Care*, *19*(4), 276–284. https://doi.org/10.3109/13625187.2014.917623

Bradley, S. E. K., Croft, T. N., & Rutstein, S. O. (2011). The Impact of Contraceptive Failure on Unintended Births and Induced Abortions: Estimates and Strategies for Reduction. DHS Analytical Studies No. 22. *Calverton, Maryland, USA: ICF Macro.*, *September*.

Broecker, J., Jurich, J., & Fuchs, R. (2016). The relationship between long-acting reversible contraception and insurance coverage: A retrospective analysis. *Contraception*, *93*(3), 266–272. https://doi.org/10.1016/j.contraception.2015.11.006

Coates, C., Catherine, G., & Simpson, T. (2018). A Qualitative Study Exploring Contraceptive Practices and Barriers to Long-Acting Reversible Contraceptive Use in a Sample of Adolescents Living in the Southern United States. *Journal of Pediatric and Adolescent Gynecology*.

Cooper, M., Boydell, N., Heller, R., & Cameron, S. (2018). Community sexual health providers' views on immediate postpartum provision of intrauterine contraception. *BMJ Sexual and Reproductive Health*, *44*(2), 97–102. https://doi.org/10.1136/bmjsrh-2017-101905

Dassah, E. T., Odoi, A. T., & Owusu-Asubonteng, G. (2013). Prevalence and factors predictive of long-acting reversible contraceptive use in a tertiary hospital in urban Ghana. *European Journal of Contraception and Reproductive Health Care*, *18*(4), 293–299.

https://doi.org/10.3109/13625187.2013.790951

Dawood, A. S., & Dawood, A. S. (2017). Awareness, attitude and preference of long-acting reversible contraceptives by Tanta University contraceptive clinic attendants. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, *6*(9), 3725. https://doi.org/10.18203/2320-1770.ijrcog20174015

Dempsey, A. R., Billingsley, C. C., Savage, A. H., & Korte, J. E. (2012). Predictors of long-acting reversible contraception use among unmarried young adults. *American Journal of Obstetrics and Gynecology*, *206*(6), 526.e1-526.e5. https://doi.org/10.1016/j.ajog.2012.02.014

Diedrich, J. T., Zhao, Q., Madden, T., Secura, G. M., & Peipert, J. F. (2015). Three-year continuation of reversible contraception. *American Journal of Obstetrics and Gynecology*, *213*(5), 662.e1-662.e8. https://doi.org/10.1016/j.ajog.2015.08.001

Eeckhaut, M. C. W., & Rendall, M. S. (2021). Are Births More Likely to be Intended Following Use of Long-Acting Reversible Contraceptives? An Analysis of U.S. Births in 2003–2015. *Population Research and Policy Review*. https://doi.org/10.1007/s11113-021-09680-5

Engstrand, S., & Kopp Kallner, H. (2018). Cost of unintended pregnancy in Sweden — a possibility to lower costs by increasing LARC usage. *Contraception*, *97*(5), 445–450. https://doi.org/10.1016/j.contraception.2018.01.009

Espey, E., & Ogburn, T. (2011). Long-acting reversible contraceptives: Intrauterine devices and the contraceptive implant. *Obstetrics and Gynecology*, *117*(3), 705–719. https://doi.org/10.1097/AOG.0b013e31820ce2f0

Fekadu, H., Kumera, H., Yesuf, E., Hussien, G., & Tafa, M. (2017). Prevalence and Determinant Factors of Long Acting Contraceptive Utilization among Married Women of Reproductive Age in Adaba Town, West Arsi Zone, Oromia, Ethiopia. *Journal of Women's Health Care*, *06*(01). https://doi.org/10.4172/2167-0420.1000360

Fentie, E. A., Asmamaw, D. B., Shewarega, E. S., Negash, W. D., Teklu, R. E., Alemu, T. G., Eshetu, H. B., Belay, D. G., Aragaw, F. M., & Fetene, S. M. (2023). Socioeconomic inequality in modern contraceptive utilization among reproductive-age women in sub-Saharan African countries: a decomposition analysis. *BMC Health Services Research*, *23*(1), 1–10. https://doi.org/10.1186/s12913-023-09172-6

Galle, A., Vermandere, H., Griffin, S., De Melo, M., Machaieie, L., Van Braeckel, D., & Degomme, O. (2018). Quality of care in family planning services in rural Mozambique

with a focus on long acting reversible contraceptives: A cross-sectional survey. *BMC Women's Health*, *18*(1), 1–13. https://doi.org/10.1186/s12905-018-0692-z

Gariepy, A. M., Simon, E. J., Patel, D. A., Creinin, M. D., & Schwarz, E. B. (2011). The impact of out-of-pocket expense on IUD utilization among women with private insurance. *Contraception*, *84*(6), e39–e42. https://doi.org/10.1016/j.contraception.2011.07.002

Gashaye, K. T., Tsegaye, A. T., Abebe, S. M., Woldetsadik, M. A., Ayele, T. A., & Gashaw, Z. M. (2020). Determinants of long acting reversible contraception utilization in Northwest Ethiopia: An institution-based case control study. *PLoS ONE*, *15*(10 October), 1–19. https://doi.org/10.1371/journal.pone.0240816

Gayatri, M. (2020). The Utilization of Long-Acting Reversible Contraception and Associated Factors Among Women in Indonesia. *Global Journal of Health Science*, *12*(3), 110. https://doi.org/10.5539/gjhs.v12n3p110

Gelagay, A. A., Koye, D. N., & Yeshita, H. Y. (2018). Factors affecting long acting and permanent contraceptive methods utilization among HIV positive married women attending care at ART clinics in Northwest Ethiopia. *Archives of Public Health*, *76*(1), 1–9. https://doi.org/10.1186/s13690-018-0294-0

Grimes, D. A. (2009). Forgettable contraception. *Contraception*, *80*(6), 497–499. https://doi.org/10.1016/j.contraception.2009.06.005

Gudaynhe, S., Desalegn, Z., Asmamaw, T., & Getiye, K. (2014). *Factors affecting use of Long-Acting Reversible Contraceptive Methods among married women in Debre Markos Town, Northwest Ethiopia 2013*.

Gujo, A. B., & Kare, A. P. (2021). Utilization of Long-Acting Reversible Contraceptives and Associated Factors Among Reproductive Age Women Attending Governmental Health Institutions for Family Planning Services in Wondo Genet District, Sidama, National Regional State, Southern Ethiopia. *Health Services Research and Managerial Epidemiology*, *8*, 1–7. https://doi.org/10.1177/23333928211002401

Haile, K., Gebremedhin, M., Berhane, H., Gebremedhin, T., Abraha, A., Berhe, N., Haile, T., Gigar, G., & Girma, Y. (2016). Desire for birth spacing or limiting and non-use of long acting and permanent contraceptive methods among married women of reproductive age in Aksum Town, North Ethiopia. *Contraception and Reproductive Medicine*, *1*(1), 1–10. https://doi.org/10.1186/s40834-016-0033-2

Hall, K. S., Ela, E., Zochowski, M. K., Caldwell, A., Moniz, M., McAndrew, L., Steel, M., Challa, S., Dalton, V. K., & Ernst, S. (2016). "I don't know enough to feel comfortable

using them:" Women's knowledge of and perceived barriers to long-acting reversible contraceptives on a college campus. *Contraception*, *93*(6), 556–564. https://doi.org/10.1016/j.contraception.2016.02.007

Harper, C. C., Rocca, C. H., Thompson, K. M., Morfesis, J., Goodman, S., Darney, P. D., Westhoff, C. L., & Speidel, J. J. (2015). Reductions in pregnancy rates in the USA with long-acting reversible contraception: A cluster randomised trial. *The Lancet*, *386*(9993), 562–568. https://doi.org/10.1016/S0140-6736(14)62460-0

Harzif, A. K., Mariana, A., Malik, D. M., Silvia, M., & Lovita, B. T. (2019). Factors associated with the utilization of long-acting reversible contraceptives among family planning clients at the Pameungpeuk rural hospital, Indonesia. *F1000Research*, *7*. https://doi.org/10.12688/f1000research.15755.2

Herd, P., Higgins, J., Sicinski, K., & Merkurieva, I. (2016). The implications of unintended pregnancies for mental health in later life. *American Journal of Public Health*, *106*(3), 421–429. https://doi.org/10.2105/AJPH.2015.302973

Homco, J. B., Peipert, J. F., Secura, G. M., Lewis, V. A., & Jenifer, E. (2011). *Patients Seeking Abortion Services*. *80*(6), 569–574. https://doi.org/10.1016/j.contraception.2009.05.127.Reasons

Hubacher, D., Olawo, A., Manduku, C., Kiarie, J., & Chen, P. L. (2012). Preventing unintended pregnancy among young women in Kenya: Prospective cohort study to offer contraceptive implants. *Contraception*, *86*(5), 511–517. https://doi.org/10.1016/j.contraception.2012.04.013

Hubacher, D., & Trussell, J. (2015). A definition of modern contraceptive methods. *Contraception*, *92*(5), 420–421. https://doi.org/10.1016/j.contraception.2015.08.008

Ikamari, L., Izugbara, C., & Ochako, R. (2013). Prevalence and Determinants of Unintended Pregnancy Among Women in Nairobi, Kenya. *BMC Pregnancy and Childbirth*, *69*, 1471–2393. https://doi.org/10.4314/gmj.v49i3.10

Jalang'O, R., Thuita, F., Barasa, S. O., & Njoroge, P. (2017). Determinants of contraceptive use among postpartum women in a county hospital in rural Kenya. *BMC Public Health*, *17*(1), 1–8. https://doi.org/10.1186/s12889-017-4510-6

Janiak, E., Clark, J., Bartz, D., Langer, A., & Gottlieb, B. (2018). Barriers and Pathways to Providing Long-Acting Reversible Contraceptives in Massachusetts Community Health Centers: A Qualitative Exploration. *Perspectives on Sexual and Reproductive Health*, *50*(3), 111–118. https://doi.org/10.1363/psrh.12071

Jonas, K., Mazinu, M., Kalichman, M., Kalichman, S., Lombard, C., Morroni, C., & Mathews, C. (2021). Factors Associated With the Use of the Contraceptive Implant Among Women Attending a Primary Health Clinic in Cape Town, South Africa. *Frontiers in Global Women's Health*, *2*(August), 1–11. https://doi.org/10.3389/fgwh.2021.672365

Joshi, R., Khadilkar, S., & Patel, M. (2015). Global trends in use of long-acting reversible and permanent methods of contraception: Seeking a balance. *International Journal of Gynecology and Obstetrics*, *131*, S60–S63. https://doi.org/10.1016/j.ijgo.2015.04.024

Judge-Golden, C. P., Wiesenfeld, H. C., Chen, B. A., & Borrero, S. (2020). Adherence to Recommended Practices for Provision of Long-Acting Reversible Contraception among Providers in a Large U.S. Health Care System. *Journal of Women's Health*, *29*(12), 1586–1595. https://doi.org/10.1089/jwh.2019.8169

Kamuyango, A., Hou, W. H., & Li, C. Y. (2020). Trends and contributing factors to contraceptive use in Kenya: A large population-based survey 1989 to 2014. *International Journal of Environmental Research and Public Health*, *17*(19), 1–12. https://doi.org/10.3390/ijerph17197065

Kavanaugh, M., Jerman, J., & Lawrence, F. (2015). Change in Use of Long-Acting Reversible Contraception Methods Among U.S. Women, 2009-2012. *Obstet Gynecol.*, *176*(3), 139–148. https://doi.org/10.1053/j.gastro.2016.08.014.CagY

Kebede, B., Belete, M., Negeri, H., Halil, H., Anshebol, A., & Abdo, R. (2020). *Magnitude and Factors Affecting Long-acting Reversible Contraceptive Utilization among Reproductive Age Women in Silti District , Southern Journal of Women ' s Health Care. August*. https://doi.org/10.35248/2167-0420.20.9.494

Kelsey, J., Whittemore, A., Evans, A., & Thompson, D. (1996). *Methods in Observational Epidemiology*.

KNBS. (2021). *Economic survey 2021*.

KNBS. (2023). Demographic and Health Survey 2022. *Demographic and Health Survey 2022*, 1–23.

Kokanalı, D., Kuntay Kokanalı, M., Ayhan, S., Cengaver, N., Özakşit, G., & Engin-Üstün, Y. (2019). Contraceptive choices of adolescents before and after the voluntary termination of pregnancy. *Journal of Obstetrics and Gynaecology*, *39*(6), 822–826. https://doi.org/10.1080/01443615.2019.1579176

KULLER, L., GOLDSTEIN, B., ROTHMAN, K., POOLE, C., VANDENBROUCKE, J., VON ELM, E., ALTMAN, D., GØTZSCHE, P., MULROW, C., POCOCK, S.,

SCHLESSELMAN, J., & EGGER, M. (2007). Strengthening the reporting of observational studies in epidemiology (STROBE) : Explanation and elaboration. Commentary : Strobe initiative. *Epidemiology (Cambridge, Mass.)*, *18*(8), 163–194.

Kungu, W., Khasakhala, A., & Agwanda, A. (2020). Use of long-acting reversible contraception among adolescents and young women in Kenya. *PLoS ONE*, *15*(11 November), 1–16. https://doi.org/10.1371/journal.pone.0241506

Lewinsohn, R., Crankshaw, T., Tomlinson, M., Gibbs, A., Butler, L., & Smit, J. (2018). "This baby came up and then he said, "I give up!"": The interplay between unintended pregnancy, sexual partnership dynamics and social support and the impact on women's well-being in KwaZulu-Natal, South Africa. *Midwifery*, *62*, 29–35. https://doi.org/10.1016/j.midw.2018.03.001

Lunani, L., Abaasa, A., & Manyonyi, G. O.-. (2018). Preveleance and factors associated with contraceptive sue among Kenyan women aged 15-49 years. *AIDS Behaviour*, 125–130. https://doi.org/10.1007/s10461-018-2203-5.PREVALENCE

Lunniss, H., Cameron, S., & Chen, Z. E. (2016). Views of general practitioners on providing contraceptive advice and long-acting reversible contraception at the 6-week postnatal visit: A qualitative study. *Journal of Family Planning and Reproductive Health Care*, *42*(2), 99–106. https://doi.org/10.1136/jfprhc-2015-101198

Luo, Z., Gao, L., Anguzu, R., & Zhao, J. (2018). Long-acting reversible contraceptive use in the post-abortion period among women seeking abortion in mainland China: Intentions and barriers. *Reproductive Health*, *15*(1), 1–9. https://doi.org/10.1186/s12978-018-0543-2

Masinter, L. M., Dina, B., Kjerulff, K., & Feinglass, J. (2017). Short Interpregnancy Intervals: Results from the First Baby Study. *Women's Health Issues*, *27*(4), 426–433. https://doi.org/10.1016/j.whi.2017.02.011

Mccance, K., & Cameron, S. (2014). *Midwives ' experiences and views of giving postpartum contraceptive advice and providing long-acting reversible contraception : a qualitative study*. 177–183. https://doi.org/10.1136/jfprhc-2013-100770

Melka, A. S., Tekelab, T., & Wirtu, D. (2015). Determinants of long acting and permanent contraceptive methods utilization among married women of reproductive age groups in western Ethiopia: A cross-sectional study. *Pan African Medical Journal*, *21*, 1–10. https://doi.org/10.11604/pamj.2015.21.246.5835

Meskele, M., & Mekonnen, W. (2014). Factors affecting women's intention to use long acting

and permanent contraceptive methods in Wolaita Zone, Southern Ethiopia: A cross-sectional study. *BMC Women's Health*, *14*(1), 1–9. https://doi.org/10.1186/1472-6874-14-109

Mitwaly, A. B. A., Abbas, A. M., Mohammed, A. F., Ismail, A. M., Shaamash, A. H., & Youssef, A. E. D. A. (2019). Knowledge, attitude and practice of long acting reversible hormonal contraception (LARHC) among women in urban upper Egypt. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, *8*(4), 1373. https://doi.org/10.18203/2320-1770.ijrcog20191184

MOH. (2017). *National Family Planning Costed Implemetation Plan 2017-2020*. 1–73.

Mohamed, E. A. E. B., Hamed, A. F., Yousef, F. M. A., & Ahmed, E. A. (2019). Prevalence, determinants, and outcomes of unintended pregnancy in Sohag district, Egypt. *Journal of the Egyptian Public Health Association*, *94*(1), 1–9. https://doi.org/10.1186/s42506-019-0014-9

Mohammed, E. (2017). Acceptance of Long Acting Reversible Contraceptive Methods and Associated Factors Among Reproductive Age Women in &lt;i&gt;Adama Town, Oromia Regional State, Ethiopia&lt;/i&gt; *Clinical Medicine Research*, *6*(2), 53. https://doi.org/10.11648/j.cmr.20170602.15

Moreau, C., Ph, D., Bohet, A., Hassoun, D., & Teboul, M. (2013). *Trends and determinants of use of long-acting reversible contraception use among young women in France : results from three national surveys conducted between 2000 and 2010*. 451–458.

Mumah, J. N., Mulupi, S., Wado, Y. D., Ushie, B. A., Nai, D., Kabiru, C. W., & Izugbara, C. O. (2020). Adolescents' narratives of coping with unintended pregnancy in Nairobi's informal settlements. *PLoS ONE*, *15*(10 October), 1–16. https://doi.org/10.1371/journal.pone.0240797

Nanda, G., Rademacher, K., Solomon, M., Mercer, S., Wawire, J., & Ngahu, R. (2018). Experiences with the levonorgestrel-releasing intrauterine system in Kenya: qualitative interviews with users and their partners. *European Journal of Contraception and Reproductive Health Care*, *23*(4), 303–308. https://doi.org/10.1080/13625187.2018.1499892

Nanda, S., Ojha, R., & Nayak, S. (2020). Barriers to contraceptive use in adult women attending a tertiary referral hospital. *International Journal of Advanced Research in Medicine*, *2*(1), 46–49. https://doi.org/10.22271/27069567.2020.v2.i1a.75

Ochako, R., & Gichuhi, W. (2016). Pregnancy wantedness, frequency and timing of antenatal

care visit among women of childbearing age in Kenya. *Reproductive Health*, *13*(1), 1–8. https://doi.org/10.1186/s12978-016-0168-2

Oduyebo, T., Zapata, L. B., Boutot, M. E., Tepper, N. K., Curtis, K. M., D'Angelo, D. V., Marchbanks, P. A., & Whiteman, M. K. (2019). Factors associated with postpartum use of long-acting reversible contraception. *American Journal of Obstetrics and Gynecology*, *221*(1), 43.e1-43.e11. https://doi.org/10.1016/j.ajog.2019.03.005

Ojuok, R., Nyamongo, D. D., & Mutai, D. J. (2022). Determinants of unintended pregnancy among women attending antenatal clinic at Kenyatta National Hospital. *F1000Research*, *11*, 1–17. https://doi.org/10.12688/f1000research.108815.1

Okafor, I. I. (2018). Uptake of Long-Acting Reversible Contraceptive Methods in Enugu State University Teaching Hospital Enugu, South-East, Nigeria. *Diversity & Equality in Health and Care*, *13*(3). https://doi.org/10.21767/2049-5471.100055

Ontiri, S., Ndirangu, G., Kabue, M., Biesma, R., Stekelenburg, J., & Ouma, C. (2019). Long-acting reversible contraception uptake and associated factors among women of reproductive age in rural Kenya. *International Journal of Environmental Research and Public Health*, *16*(9), 1–11. https://doi.org/10.3390/ijerph16091543

Peipert, J. F., Madden, T., Allsworth, J. E., & Secura, G. M. (2012). Preventing unintended pregnancies by providing no-cost contraception. *Obstetrics and Gynecology*, *120*(6), 1291–1297. https://doi.org/10.1097/AOG.0b013e318273eb56

Ponce de Leon, R. G., Ewerling, F., Serruya, S. J., Silveira, M. F., Sanhueza, A., Moazzam, A., Becerra-Posada, F., Coll, C. V. N., Hellwig, F., Victora, C. G., & Barros, A. J. D. (2019). Contraceptive use in Latin America and the Caribbean with a focus on long-acting reversible contraceptives: prevalence and inequalities in 23 countries. *The Lancet Global Health*, *7*(2), e227–e235. https://doi.org/10.1016/S2214-109X(18)30481-9

Potter, J., Rubin, S. E., & Sherman, P. (2014). Fear of intrauterine contraception among adolescents in New York City. *Contraception*, *89*(5), 446–450. https://doi.org/10.1016/j.contraception.2014.01.011

Radovich, E., Dennis, M. L., Barasa, E., Cavallaro, F. L., Wong, K. L. M., Borghi, J., Lynch, C. A., Lyons-Amos, M., Abuya, T., & Benova, L. (2019). Who pays and how much? A cross-sectional study of out-of-pocket payment for modern contraception in Kenya. *BMJ Open*, *9*(2), 1–11. https://doi.org/10.1136/bmjopen-2018-022414

Robinson, N., Moshabela, M., Owusu-Ansah, L., Kapungu, C., & Geller, S. (2016). Barriers to Intrauterine Device Uptake in a Rural Setting in Ghana. *Health Care for Women*

*International*, *37*(2), 197–215. https://doi.org/10.1080/07399332.2014.946511

Rose, S. B., & Lawton, B. A. (2012). Impact of long-acting reversible contraception on return for repeat abortion. *American Journal of Obstetrics and Gynecology*, *206*(1), 37.e1-37.e6. https://doi.org/10.1016/j.ajog.2011.06.102

S.P., W., R., S., N., L., S., C., L., H., J., V., & D., S. (2017). Side-effects and social norms influencing family planning use in Nepal. *Kathmandu University Medical Journal*, *15*(59), 222–229. http://www.embase.com/search/results?subaction=viewrecord&from=export&id=L6216 49683

Sahilemichael, A. (2015). Determinants of Long Acting Reversible Contraceptives Use among Child Bearing Age Women in Dendi District, Western Ethiopia. *Journal of Womens Health Care*, *04*(04). https://doi.org/10.4172/2167-0420.1000242

Sanchez, E. K., McGuire, C., Calhoun, L. M., Hainsworth, G., & Speizer, I. S. (2021). Influences on contraceptive method choice among adolescent women across urban centers in Nigeria: a qualitative study. *Contraception and Reproductive Medicine*, *6*(1), 1–10. https://doi.org/10.1186/s40834-020-00146-1

Sarfraz, M., Hamid, S., Rawstorne, P., Ali, M., & Jayasuriya, R. (2021). *Role of social network in decision making for increasing uptake and continuing use of long acting reversible ( LARC ) methods in Pakistan*. 1–11.

Shiferaw, K., & Musa, A. (2017). Assessment of utilization of long acting reversible contraceptive and associated factors among women of reproductive age in Harar city, Ethiopia. *Pan African Medical Journal*, *28*, 1–8. https://doi.org/10.11604/pamj.2017.28.222.13475

Singh, A., Upadhyay, A. K., Singh, A., & Kumar, K. (2017). The Association Between Unintended Births and Poor Child Development in India: Evidence from a Longitudinal Study. *Studies in Family Planning*, *48*(1), 55–71. https://doi.org/10.1111/sifp.12017

Syum, H., Kahsay, G., Huluf, T., Beyene, B., Gerensea, H., Gidey, G., Desta, H., Abay, M., Nuguse, H., & Haile, K. (2019). Intention to use long-acting and permanent contraceptive methods and associated factors in health institutions of Aksum Town, North Ethiopia. *BMC Research Notes*, *12*(1), 1–6. https://doi.org/10.1186/s13104-019-4769-z

Tang, J. H., Dominik, R., Re, S., Brody, S., & Stuart, G. S. (2013). Characteristics associated with interest in long-acting reversible contraception in a postpartum population. *Contraception*, *88*(1), 52–57. https://doi.org/10.1016/j.contraception.2012.10.014

Tibaijuka, L., Odongo, R., Welikhe, E., Mukisa, W., Kugonza, L., Busingye, I., Nabukalu, P., Ngonzi, J., Asiimwe, S. B., & Bajunirwe, F. (2017). Factors influencing use of long-acting versus short-acting contraceptive methods among reproductive-age women in a resource-limited setting. *BMC Women's Health*, *17*(1), 1–13. https://doi.org/10.1186/s12905-017-0382-2

Tilahun, A., Yoseph, A., & Dangisso, M. (2020). *Utilization and predictors of long acting reversible contraceptive methods among reproductive age women in Hawassa city , South Ethiopia : a community based mixed methods*. 1–11.

Tocce, K. M., Sheeder, J. L., & Teal, S. B. (2012). Rapid repeat pregnancy in adolescents: Do immediate postpartum contraceptive implants make a difference? *American Journal of Obstetrics and Gynecology*, *206*(6), 481.e1-481.e7. https://doi.org/10.1016/j.ajog.2012.04.015

Trussell, J., Fareen, H., Lowin, J., Law, A., & Filonenko, A. (2015). 基因的改变NIH Public Access. *Contraception*, *91*(1), 49–56. https://doi.org/10.1016/j.contraception.2014.08.011.Achieving

Trussell, J., Hassan, F., Henry, N., Pocoski, J., Law, A., & Filonenko, A. (2014). Cost-effectiveness analysis of levonorgestrel-releasing intrauterine system (LNG-IUS) 13.5 mg in contraception. *Contraception*, *89*(5), 451–459. https://doi.org/10.1016/j.contraception.2013.10.019

Udeh, B., Losch, M., & Spies, E. (2009). The Cost of Unintended Pregnancy in Iowa: A Benefit-Cost Analysis of Public Funded Family Planning Services. *Health Policy Research*, 48. http://ir.uiowa.edu/cgi/viewcontent.cgi?article=1047&context=ppc_health

Vu, Q., Micks, E., McCoy, E., & Prager, S. (2016). Efficacy and safety of long-acting reversible contraception in women with cardiovascular conditions. *American Journal of Cardiology*, *117*(2), 302–304. https://doi.org/10.1016/j.amjcard.2015.10.026

Weidert, K., Tekou, K. B., & Prata, N. (2020). <p>Quality of Long-acting Reversible Contraception Provision in Lomé, Togo</p>. *Open Access Journal of Contraception*, *Volume 11*, 135–145. https://doi.org/10.2147/oajc.s257385

WHO. (2006). *Reproductive health indicators: Guidelines for their generation, interpratation and analysis for global monitoring*. https://doi.org/10.1016/S0277-9536(02)00341-6

Winner, B., Peipert, J. F., Zhao, Q., Buckel, C., Madden, T., Allsworth, J. E., & Secura, G. M. (2012). Effectiveness of long-acting reversible contraception. *Obstetrical and Gynecological Survey*, *67*(9), 552–553.

https://doi.org/10.1097/01.ogx.0000421455.21771.a1

Yalew, S. A., Zeleke, B. M., & Teferra, A. S. (2015). Demand for long acting contraceptive methods and associated factors among family planning service users, Northwest Ethiopia: A health facility based cross sectional study. *BMC Research Notes*, *8*(1), 1–10. https://doi.org/10.1186/s13104-015-0974-6

Yohannes Dibaba, W., Gurmu, E., Tilahun, T., & Bangha, M. (2019). *Contextual influences on the choice of long- acting reversible and permanent contraception in Ethiopia : A multilevel analysis*. 1–17.

Zerden, M. L., Tang, J. H., Stuart, G. S., Norton, D. R., Verbiest, S. B., & Brody, S. (2015). Barriers to Receiving Long-acting Reversible Contraception in the Postpartum Period. *Women's Health Issues*, *25*(6), 616–621. https://doi.org/10.1016/j.whi.2015.06.004

## 10.0. APPENDICES

## 10.1. Statement of information and written informed consent form

Title of Study: Factors associated with use of long-acting reversible contraceptives among women attending the family planning clinic at two referral hospitals in Nairobi County, Kenya.

Principal Investigator and institutional affiliation: Richelle W. Kihoro, University of Nairobi, Department of Public and Global Health

Supervisor: Dr. Jacqueline J. Chesang, University of Nairobi, Department of Public and Global Health

**Introduction**

I am Richelle W. Kihoro. I am currently pursuing a master's degree in Public Health. One of the requirements needed for the award of degree of Master of Public Health from the University of Nairobi is to conduct research. I am doing a study on the factors associated with use of use of long-acting reversible contraceptives among women attending the family planning clinic at two referral hospitals in Nairobi County, Kenya. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be a participant in the study. Feel free to ask any questions about the purpose of the research, what happens if you participate in the study, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. If you decide to join the study, I will request you to sign this form and I will give you a copy of this form for your records. Your decision to participate is entirely voluntary. You may withdraw from the study at any time without necessarily giving a reason for your withdrawal and this will not affect the services you are entitled to in this hospital.

**What is this study about?**

The research is being done to learn more about use of long- acting reversible contraceptives and the researchers will be interviewing women attending the family planning clinics at Kenyatta National Hospital and Mbagathi County Hospital. The purpose of the interview is to establish factors associated with use of long-acting reversible contraceptives among women attending the family planning clinics at Kenyatta National Hospital and Mbagathi County Hospital. You will be asked questions about your experience or exposure to some factors thought to be associated with use of long-acting reversible contraceptives. This study will compromise approximately 206 participants, randomly chosen. We are asking for your consent to consider participating in this study.

**What will happen if you decide to be in this research study?**

If you agree to participate in this study, you will be interviewed by a trained interviewer in a private area where you feel comfortable answering questions. Depending on whether you use long-acting reversible contraceptives or not, the interviewer will administer a questionnaire and ask you about your sociodemographic, reproductive and facility characteristics. The interview will last approximately twenty (10) minutes.

**Are there any risks, harms, discomforts associated with this study?**

The risks of being part of this study are low. The study staff will ask you questions about yourself and your medical history. Some of the questions might make you feel uncomfortable. If this happens, feel free not to answer the questions.

**Are there any benefits being in this study?**

If you take part in this study the results may contribute to understanding why some women use long-acting reversible contraceptives and others do not. The information will also contribute to science and health policy making.

**Will being in this study cost you anything?**

Participating in this research study will not cost you anything unless in the case where you will call or text the provided telephone numbers for questions or concerns related to your participation in the study. Participation in this study is voluntary and there will be no compensation for participation.

**What if you have questions in future?**

If you have further questions or concerns about participating in this study, please call or send a text message to the principal investigator Richelle W. Kihoro, Phone 0726164421. For more information about your rights as a research participant you may contact the Secretary/Chairperson, Kenyatta National Hospital-University of Nairobi Ethics and Research Committee by calling 2726300 extension 44102 or email uonknh_erc@uonbi.ac.ke

**What are your other choices?**

Your decision to participate in research is voluntary. You are free to decline participation in the study and you can withdraw from the study at any time without injustice or loss of any benefits.

## CONSENT FORM (STATEMENT OF CONSENT)

**Participant's statement**

I have read and had the chance to discuss this research study with a research assistant. I have had my questions answered in a language that I understand. The risks and benefits have been explained to me. I understand that my participation in this study is voluntary and that I may choose to withdraw any time. I freely agree to participate in this research study. I understand that all efforts will be made to keep information regarding my personal identity confidential. I will continue to receive the same quality of care I am currently receiving.

I freely agree to participate in this study. I have been informed and I am aware that I am free to contact Richelle W. Kihoro on 0726164421 if I have any questions or concerns about this study including my rights as a study participant.

I agree to participate in this research study:     Yes ☐     No ☐

**Participant signature** ——————————————————————————

**Date** ——————————————————————

If you are willing to be contacted for further information about this study, please provide your phone number (This is not mandatory):

**Phone Number** ——————————————————————

**Researcher's statement**

I have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has willingly and freely given her consent.

**Data collector's Name:** _____

**Date:** _____

**Signature** _____

**Role in the study:** _____
**[Principal Investigator (PI) or Research Assistant (RA)]**

**10.2. Tarifa yam habari na formu ya idhini**

Kichwa cha Utafiti: Mambo yanayohusiana na matumizi ya vidhibiti mimba vinavyotumika kwa muda mrefu miongoni mwa wanawake wanaohudhuria kliniki ya upangaji uzazi katika hospitali mbili za rufaa katika Kaunti ya Nairobi, Kenya.

Mpelelezi Mkuu na uhusiano wa kitaasisi: Richelle W. Kihoro, Chuo Kikuu cha Nairobi, Idara ya Afya ya Umma na Ulimwenguni.

Msimamizi: Dkt. Jacqueline J. Chesang, Chuo Kikuu cha Nairobi, Idara ya Afya ya Umma na Ulimwenguni

**Utangulizi**

Mimi ni Richelle W. Kihoro. Kwa sasa ninafuata shahada ya uzamili katika Afya ya Umma. Mojawapo ya mahitaji yanayohitajika kwa ajili ya kutunukiwa shahada ya Uzamili ya Afya ya Umma kutoka Chuo Kikuu cha Nairobi ni kufanya utafiti. Ninafanya utafiti kuhusu mambo yanayohusiana na matumizi ya vidhibiti mimba vinavyotumika kwa muda mrefu miongoni mwa wanawake wanaohudhuria kliniki ya upangaji uzazi katika hospitali mbili za rufaa katika Kaunti ya Nairobi, Kenya. Madhumuni ya fomu hii ya idhini ni kukupa taarifa utakayohitaji ili kukusaidia kuamua kama kuwa mshiriki au la katika utafiti. Jisikie huru kuuliza maswali yoyote kuhusu madhumuni ya utafiti, nini kitatokea ukishiriki katika utafiti, hatari na manufaa yanayowea kutokea, haki zako kama mtu wa kujitolea, na jambo lingine lolote kuhusu utafiti au fomu hii ambalo haliko wazi. Ukiamua kujiunga na utafiti, nitakuomba utie sahihi fomu hii na nitakupa nakala ya fomu hii kwa rekodi zako. Uamuzi wako wa kushiriki ni wa hiari kabisa. Unaweza kujiondoa kwenye utafiti wakati wowote bila kutoa sababu ya kujiondoa na hii haitaathiri huduma unazostahili kupata katika hospitali hii.

**Malengo**

Utafiti unafanywa ili kujifunza zaidi kuhusu matumizi ya vidhibiti mimba vilivyotumika kwa muda mrefu na watafiti watakuwa wakiwahoji wanawake wanaohudhuria kliniki za kupanga uzazi katika Hospitali ya Kitaifa ya Kenyatta na Hospitali ya Kaunti ya Mbagathi. Madhumuni ya mahojiano ni kubainisha mambo yanayohusiana na matumizi ya vidhibiti mimba vilivyotumika kwa muda mrefu miongoni mwa wanawake wanaohudhuria kliniki za kupanga uzazi katika Hospitali ya Kitaifa ya Kenyatta na Hospitali ya Kaunti ya Mbagathi. Utaulizwa maswali kuhusu uzoefu wako au kufichuliwa kwa baadhi ya vipengele vinavyofikiriwa kuhusishwa na matumizi ya vidhibiti mimba vinavyofanya kazi kwa muda mrefu. Utafiti huu utaathiri takriban washiriki **206** waliochaguliwa bila mpangilio. Tunaomba idhini yako ili kuzingatia kushiriki katika utafiti huu.

**Taratibu zitakazohusishwa**

Ikiwa unakubali kushiriki katika utafiti huu, utahojiwa na mhojiwa aliyefunzwa katika eneo la faragha ambapo unahisi vizuri kujibu maswali. Kulingana na kama unatumia vidhibiti mimba vinavyoweza kutenduliwa kwa muda mrefu au la, mhojiwa atasimamia dodoso na kukuuliza kuhusu sifa zako za demokrasia ya kijamii, uzazi na kituo. Mahojiano yatadumu takriban dakika ishirini (20).

**Hatari**

Hatari za kuwa sehemu ya utafiti huu ni ndogo. Wafanyikazi wa utafiti watakuuliza maswali kukuhusu wewe na historia yako ya matibabu. Baadhi ya maswali yanaweza kukufanya ukose raha. Hili likitokea, jisikie huru kutojibu maswali.

**Faida**

Ukishiriki katika utafiti huu matokeo yanaweza kuchangia kuelewa kwa nini baadhi ya wanawake wanatumia vidhibiti mimba vinavyotumika kwa muda mrefu na wengine hawatumii. Taarifa hizo pia zitachangia katika uundaji wa sera za sayansi na afya.

**Gharama**

Hakuna gharama za moja kwa moja za kifedha kwa kushiriki katika utafiti huu. Walakini, inaweza kukugharamu kidogo ikiwa una swali la kufuata au wasiwasi kuhusu ushiriki wako ambao unakuhitaji kuwasiliana na mpelezi mkuu kupitia simu.

**Mfumo wa mahusiano zaidi**

Ikiwa una maswali zaidi au wasiwasi juu ya kushiriki katika utafiti huu, tafadhali piga simu au tuma ujumbe mfupi kwa mpelelezi mkuu Richelle W. Kihoro, Simu 0726164421. Kwa maelezo zaidi kuhusu haki zako kama mshiriki wa utafiti unaweza kuwasiliana na Katibu/Mwenyekiti, Kenyatta. Hospitali ya Taifa-Kamati ya Maadili na Utafiti ya Chuo Kikuu cha Nairobi kwa kupiga 2726300 ugani 44102 au barua pepe uonknh_erc@uonbi.ac.ke

**Chaguzi zako**

Uamuzi wako wa kushiriki katika utafiti ni wa hiari. Uko huru kukataa kushiriki katika utafiti na unaweza kujiondoa kutoka kwa utafiti wakati wowote bila dhuluma au hasara ya manufaa yoyote.

## FOMU YA ITHINI (TAARIFA YA MAJIBU)

**Taarifa ya mshiriki**

Nimesoma na nimepata nafasi ya kujadili utafiti huu na msaidizi wa utafiti. Nimejibiwa maswali yangu kwa lugha ninayoielewa. Hatari na faida zimeelezewa kwangu. Ninaelewa kuwa ushiriki wangu katika utafiti huu ni wa hiari na kwamba ninaweza kuchagua kujiondoa wakati wowote. Ninakubali kwa hiari kushiriki katika utafiti huu. Ninaelewa kuwa juhudi zote zitafanywa kutunza habari kuhusu kitambulisho changu kibinafsi kuwa siri. Nitaendelea kupata huduma bora ninayopokea sasa.

Ninakubali kwa uhuru kushiriki katika utafiti huu. Nimearifiwa na ninafahamu kuwa niko huru kuwasiliana na Richelle W. Kihoro kwa 0726164421 ikiwa nina maswali yoyote au wasiwasi wowote kuhusu utafiti huu pamoja na haki zangu kama mshiriki wa utafiti.


**Ninakubali kushiriki katika utafiti huu wa utafiti:**  **Ndiyo**  ☐  **Hapana** ☐




**Saini ya mshiriki** _____


**Tarehe** _____



Ikiwa uko tayari kuwasiliana kwa maelezo zaidi kuhusu utafiti huu, tafadhali toa nambari yako ya simu (Hii si lazima):


**Nambari ya simu**

<u>Taarifa ya mtafiti</u>

Nimeelezea kabisa maelezo yanayofaa ya utafiti huu kwa mshiriki aliyetajwa hapo juu na ninaamini kwamba mshiriki ameelewa na amepeana kwa hiari yake ruhusa ya kushiriki utafiti huu.

**Jina la mtafiti** ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

**Tarehe** ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Saini ya mtafiti ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

**Jukumu katika utafiti** :⎯⎯⎯[Mpelelezi Mkuu (PI) au Msaidizi wa Utafiti (RA)]

**10.3. Questionnaire**

**FACTORS ASSOCIATED WITH USE OF LONG-ACTING REVERSIBLE CONTRACEPTIVES AMONG WOMEN SEEKING FAMILY PLANNING SERVICES AT TWO REFERRAL HOSPITALS IN NAIROBI COUNTY, KENYA.**

Participant's number:

Date:                                        Time:

The questionnaire should only be filled in by the PI or RAs by interviewing a participant who has already given her written and signed consent to participate in this study. You should not put the participant's name on the questionnaire. Information collected from the questionnaire is confidential and for research purposes only.

**Instructions**

Kindly answer all the following questions by writing in the provided spaces or by circling the correct response

**Section A: Socio-demographic factors**

Case:                                        Control:

1. What is your date of birth?......................(DD/MM/YYYY)

2. What is your current marital status? (Circle one answer only)

    1. Never Married
    2. Married
    3. Living Together
    4. Divorced/ Separated
    5. Widowed

3. What is the highest level of your education? (Circle one answer only)

    1   No education
    2   Primary incomplete
    3   Primary complete
    4   Secondary and above

4. What is your religion? (Circle one answer only)

    1   Protestant/ other Christian
    2   Roman Catholic
    3   Muslim
    4   No religion

5 Other

5. What is your occupation? (Circle one answer only)

    1. Wage employees

    2. Self-employed

    3. Unemployed

6. Where do you live?.....................(Name your county)

7. Did you discuss with your partner your choice of contraception (Circle one answer only)?

    1 Yes

    2 No (If No proceed to question 8)

8. Does your husband approve of your current contraception? (Circle one answer only)

    1 Approve

    2 Disapprove

    3 I don't know

**Section B: Reproductive factors**

9. Have you ever been pregnant? (Circle one answer only)

    1 Yes

    2 No (If No Proceed to Question 15)

10. Do you have any children? (Circle one answer only)

    1 Yes

    2 No

11. If yes, how many children do you have? .............children

12. Do you want to have another baby in the future? (Circle one answer only)

    1. Yes

    2. No

    3. I don't know

    4. It depends on my husband

13. Was your last pregnancy planned? (Circle one answer only)

    1. Planned

    2. Unplanned

14. Have you ever had a miscarriage/abortion? (Circle one answer only)

    1. Yes

    2. No

15. How long would you want to wait before the next pregnancy (birth intervals)? ............ years

16. How old were you when you first had sex? ............ years

**Section C: Health System Factors**

17. Did you pay for the contraception method you have just received? (Circle one answer only)

        1  Yes

        2  No

18. If you paid for the contraception method how much was the total cost inclusive of the consultation fee? KSH.............(Consultation) KSH.............(Cost of contraception)

19. Has money ever hindered you from receiving the contraceptive of your choice?

        1  Yes

        2  No

20. Have you ever visited the health facility and lacked your contraceptive of choice? (Circle one answer only)

        1  Yes

        2  No

21. If yes, which contraceptive method was it? (Circle all that apply)

        1.IUDs

        2.Implant

        3.Condoms

        4.Pills

        5.Injectable

        6.Others     Specify …….

22. Which methods did the health care provider counsel you on today? (Circle all that apply)

        1  IUD

        2  Implant

        3  Condoms

        4  Pills

        5  Injectable

        6  Others

23. Would you recommend someone else to seek the same services from this facility? (Circle one answer only)

        1  Yes

2   No

24. How did you feel about the amount of time you took to get your contraception services at the facility? (Circle one answer only)

      1.   The amount of time was acceptable

      2.   The amount of time was not acceptable

25. If you didn't take an IUDs or implant as your contraceptive choices, would you consider to use it in the future? (Circle one answer only)

      1   Yes

      2   No

26. If yes to Question 24, is there a reason why?

……………………………………………………………………………

……………………………………………………………………………

……………………………………………………………………………

………………………………………………………………………………………

27. If no to Question 24, is there a reason why?

…………………………………………………………………………………………

………………………………………………………………………

……………………………………………………………………………

……………………………………………………………………………

**10.4. Orodha ya maswali ya uchunguzi**

**MAMBO YANAYOHUSISHWA NA MATUMIZI YA MIMBA MIREFU INAYOWEZA KUREJESHWA MIONGONI MWA WANAWAKE WANAOTAFUTA HUDUMA ZA UZAZI WA UZAZI KATIKA HOSPITALI MBILI ZA RUFAA KATIKA KAUNTI YA NAIROBI, KENYA.**

Nambari ya Mshiriki:

Tarehe:

Hojaji inapaswa tu kujazwa na PI au RAs kwa kumhoji mshiriki ambaye tayari amempa kibali cha maandishi na kilichotiwa saini kushiriki katika utafiti huu. Hupaswi kuweka jina la mshiriki kwenye dodoso. Taarifa zilizokusanywa kutoka kwenye dodoso ni siri na kwa madhumuni ya utafiti pekee.

**Maagizo**

Tafadhali jibu maswali yote yafuatayo kwa kuandika katika nafasi zilizotolewa au kwa kuzungusha jibu sahihi

**Sehemu ya A: Sababu za kijamii**

1. Je! Tarehe yako ya kuzaliwa ni ipi ? ............. (Siku/ Mwezi/ Mwaka)

2. Je! Hali yako ya ndoa kwa sasa ikoje? (Zungushia duara jibu moja tu)

        1   Hajawahi Kuolewa

        2   Kuolewa

        3   Kuishi Pamoja

        4   Kuackwa/ Kutengana

        5   Mjane

3. Je! Ni kiwango gani cha juu cha elimu yako? (Zungushia duara jibu moja tu)

        1. Hakuna elimu

        2. Elimu ya msingi haujakamilika

        3. Elimu ya msingi umekamilika

        4. Elimu ya Sekondari na juu

4. Je! Dini yako ni ipi? (Zungushia duara jibu moja tu)

        1. Mprotestanti/ Mkristo mwingine

        2. Roma Mkatoliki

        3. Muisalamu

        4. Hakuna dini

        5. Nyingine

5. Je! Kazi yako ni nini? (Zungushia duara jibu moja tu)

      1. Mfanyikazi wa ujira

      2. Mfanyikazi wa familia waliojiri

      3. Wasio na ujira

6.     Je, unaishi wapi?.....................(Jib na Kaunti yako)

7. Je, ulijadiliana na mpenzi wako chaguo lako la kuzuia mimba? (Zungushia duara jibu moja tu)

      1. Ndiyo

      2. Hapana (Ikiwa hapana endelea swali la 8)

8. Je! Mumeo anakubali uchaguzi lako la kuzuia mimba? (Zungushia duara jibu moja tu)

      1. Ndiyo

      2. Hapana

      3. Sijui

**Sehemu B: Sababu za uzazi**

8. Je! Umewahi kuwa mjamzito ? (Zungushia duara jibu moja tu)

      1 Ndiyo

      2 Hapana (Ikiwa hapana endelea na swali la 15)

9. Je! Una watoto wowote? (Zungushia duara jibu moja tu)

      1 Ndiyo

      2 Hapana

10. Ikiwa ndio, una watoto wangapi? ............. watoto

11. Je! Unataka kupata mtoto mwingine katika siku zijazo? (Zungushia duara jibu moja tu)

      1 Ndiyo

      2 Hapana

      3 Sijui

      4 Inategemea mume wangu

12. Je! Mimba yako ya mwisho ilipangwa? (Zungushia duara jibu moja tu)

      1 Ndiyo

      2 Hapana

13. Je! Umewahi kutoa mimba? (Zungushia duara jibu moja tu)

      1. Ndiyo

      2. Hapana

14. Je, ungependa kusubiri kwa muda gani kabla ya mimba inayofuata (muda wa kuzaa)?

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............. miaka

15. Je, ulikuwa na umri gani ulipofanya ngono kwa mara ya kwanza? ......... miaka

**Sehemu ya C: Mambo ya Mfumo wa Afya**

16. Je, ulilipia njia ya kuzuia mimba ambayo umepokea hivi punde? (Zungushia duara jibu moja tu)

> 1. Ndiyo
>
> 2. Hapana (Ikiwa hapana endelea swali la 18)

17. Je, ikiwa ulilipia njia ya kuzuia mimba ni kiasi gani cha gharama ya jumla ya ada ya mashauriano? KSH ............. (Ushauri) KSH ............. (Gharama ya njia ya kuzuia mimba)

18. Je, fedha zimewahi kukuzuia njia ya kuzuia mimba ulizochagua? (Zungushia duara jibu moja tu)

> 1. Ndiyo
>
> 2. Hapana

19. Je! Umewahi kutembelea kituo cha afya na kukosa chaguo lako la njia ya kuzuia mimba? (Zungushia duara jibu moja tu)

> 1. Ndiyo
>
> 2. Hapana (Ikiwa hapana endelea swali la 21)

20. Ikiwa ndio, ni njia gani ya kuzuia mimba haikukua? (Zungusha duara zote zinazotumika)

> 1. IUD
> 2. Kupandikiza (Implant)
> 3. Kondomu
> 4. Vidonge
> 5. Sindano
> 6. Wengine    Fafanua …….

21. Je! Ni njia zipi ya kuzuia mimba ambazo mtoa huduma ya afya alikushauri leo? (Zungusha duara zote zinazotumika)

> 1. IUD
> 2. Kupandikiza
> 3. Kondomu
> 4. Vidonge
> 5. Sindano
> 6. Wengine

22. Je, ungependa kupendekeza mtu mwingine atafute huduma sawa kutoka kwa kituo hiki? (Zungushia duara jibu moja tu)

       1. Ndiyo

       2. Hapana

23. Je, ulijisikiaje kuhusu muda uliochukua kupata huduma zako za kuzuia mimba kwenye hospitali hii? (Zungushia duara jibu moja tu)

       1. Kiasi cha muda kilikubalika

       2. Muda wa muda haukukubalika

24. Je, ikiwa hukutumia IUD au Kupandikiza (Implant), ungefikiria kuzitumia katika siku zijazo? (Zungushia duara jibu moja tu)

       1. Ndiyo

       2. Hapana

25. Kama ndiyo kwa Swali la 24, kwa nini?

    …………………………………………………………………………………

    …………………………………………………………………………………

    ……………………………………………………………………………………

    …………………………………………………………………………………

26. Kama      hapana      kwa      Swali      la      24,      kwa      nini?

    ………………………………………………………………………………

    …………………………………………………………………………………

    ……………………………………………………………………………………

    …………………………………………………………………………………

## 10.5. KNH- UoN Ethics Approval Letter

**UNIVERSITY OF NAIROBI**
**FACULTY OF HEALTH SCIENCES**
P O BOX 19676 Code 00202
Telegrams: varsity
Tel:(254-020) 2726300 Ext 44355

**KNH-UON ERC**
Email: uonknh_erc@uonbi.ac.ke
Website: http://www.erc.uonbi.ac.ke
Facebook: https://www.facebook.com/uonknh.erc
Twitter: @UONKNH_ERC https://twitter.com/UONKNH_ERC

**KENYATTA NATIONAL HOSPITAL**
P O BOX 20723 Code 00202
Tel: 726300-9
Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/167

6th May, 2022

Richelle Wanjiku Kihoro
Reg. No. H57/35471/2019
Dept. of Public and Global Health
Faculty of Health Sciences
University of Nairobi

APPROVED
0 6 MAY 2022
KNH/UoN-ERC

Dear Richelle,

**RESEARCH PROPOSAL: FACTORS ASSOCIATED WITH USE OF LONG-ACTING REVERSIBLE CONTRACEPTIVES AMONG WOMEN SEEKING FAMILY PLANNING SERVICES AT TWO REFERRAL HOSPITALS IN NAIROBI COUNTY, KENYA (P130/02/2022)**

This is to inform you that KNH-UoN ERC has reviewed and approved your above research proposal. Your application approval number is **P130/02/2022.** The approval period is 6th May 2022– 5th May 2023.

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.

ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by KNH-UoN ERC.

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 KNH-UoN ERC 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 KNH-UoN ERC within 72 hours.

v. Clearance for export of biological specimens must be obtained from relevant institutions.

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 KNH-UoN ERC.

Protect to discover

## 10.6. NACOSTI Research License



**REPUBLIC OF KENYA**

**NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION**

Ref No:  319389

Date of Issue: **12/May/2022**

**RESEARCH LICENSE**

This is to Certify that Ms.. Richelle Kihoro of  University of Nairobi, has been licensed to conduct research in Nairobi on the topic: Factors associated with use of long-acting reversible contraceptives among women seeking family planning services at two referral hospitals in Nairobi County, Kenya. for the period ending : 12/May/2023.

License No: **NACOSTI/P/22/17486**

**319389**
Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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## 10.7. Nairobi Metropolitan Services Approval Letter

**REPUBLIC OF KENYA**

**EXECUTIVE OFFICE OF THE PRESIDENT**
**NAIROBI METROPOLITAN SERVICES**

Telegraphic Address
Telephone +3313002/4
When replying please quote

Kenyatta International Convention Centre
P. O. Box 49130-00100
NAIROBI

**REF: EOP/NMS/HS/142**

**DATE: 31ST May, 2022**

RICHELLE KIHORO
UNIVERSITY OF NAIROBI

Dear Ms. Kihoro,

### RE: RESEARCH AUTHORIZATION

This is to inform you that the Nairobi Metropolitan Services - Health Directorate's Research Ethics Committee (REC) reviewed the documents on the study titled " "Factors associated with use of long-acting reversible contraceptives among women seeking family planning services at two referral hospitals in Nairobi County, Kenya."

I am pleased to inform you that you have been authorized to carry out the study at Mbagathi Hospital in Nairobi County. The researcher will be required to adhere to the ethical code of conduct for health research in accordance to the Science Technology and Innovation Act, 2013 and the approval procedure and protocol for research for Nairobi.

On completion of the study, you will submit one hard copy and one copy in PDF of the research findings to the REC. In addition, you will disseminate recommendations of the research at a virtual meeting organized by the REC. By copy of this letter, the Medical Superintendent – Mbagathi Hospital is to accord you the necessary assistance to carry out this research study.

Yours sincerely,

**DR. ANDREW TORO**
**CHAIR – RESEARCH ETHICS COMMITTEE**

Cc:     Director Health Services
        Medical Superintendent – Mbagathi Hospital

## 10.8. Permission to carry out research in Kenyatta National Hospital

**KENYATTA NATIONAL HOSPITAL**
P.O. BOX 20723, 00202 Nairobi

Tel.: 2726300/2726450/2726550
Fax: 2725272
Email: knhadmin@knh.or.ke

### OFFICE OF HEAD OF DEPARTMENT, OBSTETRICS & GYNAECOLOGY
EXT.43370

KNH/HOD-OBS&GYN/07/VOL.11/

Date: 17ᵗʰ May, 2022

RICHELLE WANJIKU KIHORO
Reg.No.H57/35471/2019
Dept. of Public and Global health
Faculty of Health Science
**University of Nairobi**

Dear Richelle,

**RE: RESEARCH PROPOSAL: FACTORS ASSOCIATED WITH USE OF LONG-ACTING REVERSIBLE CONTRACEPTIVES AMONG WOMEN SEEKING FAMILY PLANNING SERVICES AT TWO REFERRAL HOSPITAL IN NAIROBI COUNTY,KENYA (P130/02/2022)**

This is to inform you that the department has given you permission to conduct the above study which has been approved by ERC.

Liaise with , In-Charge clinic 66 and Health Information (HI) to facilitate your study.

You will be expected to disseminate your results to the department upon completion of your study.

Dr. Maureen Owiti
**HOD-OBSTETRICS & GYNAECOLOGY**

Cc.
- Clinic 66
- HOD-Health Information

*Vision: A World Class Patient-Centered Specialized Hospital*     KNH: ISO 9001:2015 Certified

## 10.9. Permission to carry out research in Mbagathi County Hospital

**NAIROBI METROPOLITAN SERVICES**

REPUBLIC OF KENYA

Mbagathi Hospital, P.O Box 20725 – 00202
Email: mbagathihosp@gmail.com
Tel: 0721311808, 2724712, 2725791

Date: 17th June 2022

**Richelle Wanjiku Kihoro**

**University of Nairobi**

Dear Ms. Richelle

**RE: RESEARCH AUTHORIZATION.**

This is in reference to your application for authority to carry out a research on *'Factors Associated with Use of Long-acting Reversible Contraceptives Among Women Seeking Family Planning Services at Two Referral Hospitals in Nairobi County, Kenya."*

I am pleased to inform you that your request to undertake research in the hospital has been granted.

On completion of the research, you are expected to submit one hard copy and one soft copy of the research report/ thesis to this office.

**Dr. David Kimutai**
**For: Medical Superintendent**
**Mbagathi Hospital.**

## Dissertation

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