

**WOMEN'S AUTONOMY AND CONTRACEPTIVE USE IN KENYA: A MULTILEVEL
ANALYSIS**

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DECLARATION

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TABLE OF CONTENTS

DECLARATION	i
ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iii
LIST OF FIGURES	ii
LIST OF TABLES	iii
ABBREVIATIONS AND ACRONYMS	iv
KEY TERMS: DEFINITION	v
ABSTRACT	vi
CHAPTER ONE: INTRODUCTION	1
1.1. Background.....	1
1.2. Statement of the problem.....	7
1.3. Research Objective	7
1.4. Research Questions.....	7
1.5. Specific Objectives	8
1.6. Significance of the Study.....	8
1.7. Conceptual Framework.....	8
CHAPTER TWO: LITERATURE REVIEW	10
2.1. Introduction.....	10
2.2. Theoretical Review	10
2.3. Empirical Review.....	12
CHAPTER THREE: METHODOLOGY	14
3.0 Introduction.....	14
3.1 Study Area	14
3.2 Study Population.....	14
3.3 Study Design.....	14
3.4 Data Source.....	14
3.5 Study Sample	15

3.6 Study Variables	15
3.7 Data Analysis	17
CHAPTER FOUR: RESULTS	20
4.1.Sample Characteristics.....	20
4.2.Trends in Use of, Discontinuation, and Unmet Need for Modern FP in Kenya.....	22
4.3.Determinants of Modern Contraceptive Use in Kenya.....	26
4.4.Determinants of Unmet Modern FP Need in Kenya.....	32
4.5 Determinants of Modern FP discontinuation in Kenya	35
CHAPTER FIVE: DISCUSSION AND CONCLUSION.....	38
5.1.Discussion	38
5.1.Policy Implications	39
5.2.Study Strengths and Limitations.....	39
5.3.Recommendations.....	39
5.4.Conclusion	39
REFERENCES.....	40

LIST OF FIGURES

Figure 1: Conceptual Framework	9
Figure 2: The Health Belief Model.....	11
Figure 3: Modern Contraceptive Use (2003 to 2014 Trends)	22
Figure 4: Unmet Need for Modern FP (2003 to 2014 Trends)	23
Figure 5: Trends of Modern FP discontinuation in Kenya (2003 to 2014).....	23
Figure 6: Contraceptive use by women’s level of education (2003 to 2014)	24
Figure 7: Contraceptive use by household wealth status (2003 to 2014).....	25
Figure 8: Contraceptive use by location of residence (2003 to 2014)	25

LIST OF TABLES

Table 1: Classification of Contraceptives	1
Table 2: Sample Size.....	15
Table 3: Definition and measure of Independent variables.....	16
Table 4: Percent Distribution of Sample by Background Characteristics.....	20
Table 6: Modern Contraceptive Use by Sample Characteristics	26
Table 6: Determinants of Contraceptive Use in Kenya – Multilevel Logistic Regression	30
Table 7: Determinants of Unmet need for FP in Kenya – Multilevel Logistics Regression	33
Table 8: Determinants of FP discontinuation in Kenya – Multilevel Logistics Regression	36

ABBREVIATIONS AND ACRONYMS

CPR:	Contraceptive Prevalence Rate
EWEC:	Every Woman Every Child
FP:	Family Planning
FP2020:	Family Planning 2020
HBM:	Health Belief Model
KDHS:	Kenya Demographic and Health Survey
KNBS:	Kenya National Bureau of Statistics
ICPD:	International Conference on Population and Development
IUCD:	Intrauterine Contraceptive Device
LARC:	Long Acting and Reversible Contraceptives
NCPD:	National Council for Population and Development
PCA:	Principal Component Analysis
PRB:	Population Reference Bureau
RH:	Reproductive Health
SDGs:	Sustainable Development Goals
TFR:	Total Fertility Rate
UNFPA:	United Nations Fund for Population Activities
WHO:	World Health Organization

KEY TERMS: DEFINITION

Family Planning: According to WHO (2018), Family Planning (FP) is the capability of persons and couples to anticipate their preferred number of children and attain the desired timing and spacing of births

Unmet Need for FP: People with unmet need for FP are those who are fecund and engage in coitus but are not using any contraceptives, and report a desire to delay the next pregnancy and/or no desire to have more children (Anurdh et al, 2013).

Contraceptive Discontinuation: Contraceptive discontinuation is starting contraceptive use and then stopping while still at risk of unintended pregnancy (Castle and Askew, 2015).

ABSTRACT

Background: Modern Contraceptive Prevalence Rate (mCPR) in Kenya has steadily increased from 39% in 2008-09 to 58% in 2014. Nonetheless, the modern contraceptive need of 18% of women aged 15 – 49 years is still unmet with marked geographical variations. It is documented that women’s status and ability independently decide on their reproductive health is influences their uptake of reproductive health services. However, previous studies on how contraceptive use in Kenya is influenced by women’s level of autonomy have not isolated the contextual effects emerging from the status of women in the community. The overall objective of was to scrutinize how women’s autonomy influences the use, discontinuation, and unmet need for modern FP among adolescents and women aged 15 – 49 years in Kenya.

Methods: A pooled cross-sectional design using secondary dataset from KDHS 2014, 2008/9, and 2003 was used. KDHS use a two-stage sampling technique where clusters or primary sampling units (PSU) are sampled first then households identified from the clusters. Data was analyzed using Multilevel Logistic Regression Model.

Results: The findings of this study show that modern contraceptive use, unmet need for modern FP and modern contraceptive discontinuation is not only influenced by women’s individual level factors including women’s level of education, level of decision-making autonomy, and household wealth status but also by cluster level factors like the region of residence, cluster level of women’s autonomy and socioeconomic development.

Conclusion: In Kenya, while high women’s autonomy level is related to increased use of modern FP and decreased unmet need for modern FP, it is linked to increased rates of modern contraceptive discontinuation. RH Programmes must therefore not only focus on scaling up access to FP services, products, and information, but also put more emphasis on improving the individual and collective position of women in communities.

Key Words: “Women’s Autonomy”, “Contraceptive Use”, Kenya

CHAPTER ONE: INTRODUCTION

1.1. Background

Despite tremendous progress made in improving maternal and child health indicators, complications of pregnancy and childbirth continue to be a major reason for preventable illness and deaths of mothers and children in Africa. One way of reducing disease and death of children and mothers is increasing access to voluntary contraceptives. According to WHO (2018) accessing voluntary contraceptive and reproductive health services supports the health and well-being of users and can have positive environmental, economic, and social benefits for families and communities. Empowering women to make decisions on the timing of pregnancies and the number of children to give birth to contributes greatly to attainment of SDGs. FP is the capability of persons and couples to anticipate their preferred number of children and attain the desired timing and spacing of births (WHO, 2018). Contraceptive methods are categorized as either modern or traditional as shown in Table 1.

Table 1: Classification of Contraceptives

Modern Contraceptives	Traditional Contraceptives
Male and Female Sterilization	Withdrawal / Coitus Interruptus
Intrauterine Contraceptive Devices (IUCDs)	Abstinence
Contraceptive Implants	Fertility awareness methods
Oral Contraceptives	
Injectable Contraceptives	
Emergency Contraceptive Pills	
Condoms	
Diaphragms	
Spermicides	
Patches	
Vaginal Rings	
Lactation Amenorrhea Method	

1.1.1. Benefits of FP

According to Kavanaugh and Anderson (2013), use of modern FP expands child survival rates and the general health and wellbeing of the child and mother. Contraceptive use lowers child and maternal morbidity and mortality by reducing number of risky births for young women and women who have given birth to high number of children. According to Canning and Schultz (2012), the reduction in fertility and improvement in birth spacing directly benefits the wellbeing of the child and mother and improves development of children physically, cognitively and educationally thus leading to increased adult productivity. Reduced fertility enables women to acquire skills that increase their income. In addition, a reduced fertility allows parents to acquire more assets and raise the investments they make in their children's healthcare and education. Parents are able to invest additional finances and time in their children's healthcare, schooling, and nutrition when they have a reduced number of children. The investment parents make early in the health and nutrition of their children greatly affect the children's cognitive and physical development as well as education outcomes and income in adulthood.

Besides, reduced number of children and improved health of women changes their economic and social status by enabling more women to enter formal employment hence lowering gender inequality. In addition to immediate economic advantages, reducing fertility and decline in child mortality has far reaching effects on the growth of the economy since it allows for a healthy generation to join the labor force (Canning and Schultz, 2012).

1.1.2. Global FP Initiatives

Various global initiatives advocate for the right of women to have access to reproductive health including modern FP. Having recognized the interdependence between global population, development, and environment, the International Conference on Population and Development (ICPD) was held in September 1994 in Cairo, Egypt to discuss various issues around population. The conference enshrined human rights as a prerequisite for development and asserted the fact that sexual reproductive health is a human right. The conference also stressed the fact that empowering girls and women is essential to ensure good health (UNFPA, 2014).

In the year 2010, Every Woman Every Child initiative was started to increase national and international commitment and action to ensure that women, children are at the center of development (EWEC, 2015). In July 2012, the Family Planning 2020 (FP2020) was initiated to buttress rights of girls and women to voluntarily make reproductive health decisions. During the summit, governments made commitments in order to address barriers to FP access.

Since then, the number of countries that have committed to FP2020 has grown to 41 with Kenya being one of them. In July 2017, the five-year anniversary of the inaugural summit, leaders convened in London to evaluate lessons learned and take collective action to accelerate progress. During the summit, it was observed that above 300 million women in developing countries were using modern FP (FP2020, 2017).

However, despite all the benefits related to modern FP and the global initiatives to increase FP access, it is estimated that the modern contraceptive need of close to 225 million women residing in developing countries is not met (Anrudh et al, 2013). The WHO defines People with unmet need for FP are those who are fecund and engage in coitus but are not using any contraceptives and exhibit a desire to delay the next pregnancy and/or no desire to have more children.

1.1.3. Kenya's FP Context

From its independence in 1963, the Kenyan Government has implemented programs to manage population and promote socioeconomic development. Kenya's commitment to upholding Sexual Reproductive Health as an essential human right is affirmed the country's signing of multiple international treaties and declarations in support of human rights. Moreover, the 2010 Constitution of Kenya gives citizens a right to quality healthcare and affirms the fact that reproductive health is a basic right.

According to Owino et al (2017), from the time the country's National FP Program was formed in 1967; Kenya has adopted policies, strategies, and programs to expand and articulate guidance for the same. To this end, the Government of Kenya has created an enabling policy environment for the execution of programs focusing on population. Some of the legislative and policy frameworks that highlight Reproductive Health matters in Kenya include: Constitution of Kenya (2010), National RH Policy of 2007, National ASRH Policy of 2015, Kenya Health Sector Strategic Plan

(2013-2018), and Kenya Health Policy (2012-2030). In December 2018, Universal Health Coverage (UHC) was adopted as one of the big four agendas by the President of Kenya with expectation that by 2022, every person living in Kenya will have access to essential healthcare services through a single unified benefit package. Globally, UHC has been ratified as a SDG target and aims at guaranteeing individuals and communities' access to healthcare services without monetary constraints (Wangia and Kandie, 2019).

In addition to creating enabling policy environment, the government continues to collaborate with development partners to support the FP Program. In Kenya at the moment, FP services are offered by both government and private health facilities with the contraceptives provided freely by the public sector health facilities. Kenya's progress as far as FP programming is concerned has been tremendous. There is a steady consistent and steady progress in the country's Contraceptive Prevalence Rate from 39% (2003) to 46% (2008/09) to 58% in 2014 (KNBS, 2014). According to Owino et al (2017) Kenya's budgetary allocation for FP grew from 2.5 Million US Dollars in 2005-2006 to 6.6 Million US Dollars in 2012-2013.

1.1.4. FP Use in Kenya

According to KNBS and ICF (2015), while modern Contraceptive Prevalence Rate (mCPR) has steadily increased in Kenya from 39% in 2003 to 58% in 2014, the contraceptive need of 18% of women ages 15 – 49 years remains unmet. Besides, over a third of women stop using modern FP within one year of starting to use (Castle and Askew, 2015). Contraceptive discontinuation accounts for a third of unintended births in 36 countries (Anurdh *et al*, 2013). The main reasons for discontinuing contraceptives, according to KDHS (2014), is concerns about health and/or side effects (29%), then pregnancy desire (26%) and pregnancy (11%). Other reasons given for contraceptive discontinuation are a) Became pregnant while using; b) Disapproval from the husband or sexual partner; c) Desire for an effective contraceptive method; d) Inconvenient to use; e) Infrequent sex/partner away; f) Marital dissolution/separation. Concerns about health and/or side effects is mostly mentioned as reason for discontinuing implants (52%), IUDs (43%), injectables (38%), and the pill (28%).

1.1.5. Variations in FP Use and Unmet Need for FP in Kenya

Significant geographic variations exist in Kenya as far as contraceptive use, and unmet need for FP is concerned. According to KDHS (2014), the total need for contraceptives is highest among women age 35-39 (82%) and lowest among women aged between 15-19 years and those aged between 45-49 years. Significant variations exist on contraceptive need across regions with North Eastern region having the lowest demand (33%) and Eastern the highest (83%). Women who have no education (47%) and women in low wealth quintile (60%) have a lower demand for contraceptives than those who are more educated or wealthier. On the other hand, Unmet need for FP is higher in rural areas and decreases as the level of women's education increases. Adolescent and young women form part of the most vulnerable and underserved populations and have a higher unmet need for FP. Besides, 47% of births among adolescents aged 15 – 19 years are not intended (NCPD, 2017). According to Population Reference Bureau's (2015) more than 20% of boys and 10% girls, among youths aged between 15 and 24 years, are engaged in sex before age 15 years and nearly 18% of girls aged 15-19 year have given birth to a child. The rate of childbearing among adolescent and youth higher among those with lower education qualifications as well as lower wealth quintiles; the likelihood of adolescent girls from poor backgrounds to begin childbearing earlier is higher than the ones in wealthy backgrounds.

1.1.6. Women's Autonomy and Access to Reproductive Health Services

Defined as the freedom and capacity of women to take independent actions, women's autonomy entails their capability to make decisions and control resources. It is documented that women's status and ability to independently decide on their reproductive health influences their uptake of reproductive health services as well as diffusion of contraception. Previous studies have used women's education, employment status and wealth status as proxies for measuring women's autonomy. The studies postulate that being employed improves woman's self-esteem and confidence hence improving her power to make sexual reproductive health decisions. Moreover, education empowers women by equipping them with relevant sexual reproductive health information that give them independence to make decisions (Moursund and Kravdal, 2003). However, in recent times, researchers have deviated from the use of proxies like education and status of employment as measures of autonomy and have chosen to use direct measures. Some

parameters that are used to directly measure woman's autonomy include participation in key household decisions, household resource access and control, and movement. Studies that applied these direct measures of women's autonomy have demonstrated its significant influence in women's reproductive health behavior (Adhikari, 2016; Wado, 2013; Saleem and Bobak, 2005).

1.1.7. Socioeconomic Differentials in Contraceptive Use and Discontinuation

Previous studies on contraceptive use dynamics have documented the effects of socioeconomic factors, especially wealth, on reproductive health behavior of women. Ojaka (2008) established that education attainment, household wealth, and employment had significant association to unmet need for FP; unmet need for FP decreased as the women's education level, and wealth status increased. According to Ahmed et al (2010), the odds of the poorest women using modern contraceptive is 74% lower compared to the richest women. In addition, the probability of using modern FP methods is greater in women who had attained primary education than the ones without or with less education qualifications. Similarly, highly empowered women have 82% likelihood of using modern FP when compared to the less empowered.

Agrahari K. et al (2016) established that discontinuation rate of oral contraceptives varied based the wealth quintile: poorest (51%), poorer (50%), middle class (48%), richer (45%), and richest (49%). In addition, a higher rate of contraceptive pill discontinuation was noted in rural residents. The study also established that women having lower education levels had higher probability of removing IUCD than the more educated. Moreover, the rate of IUCD removal was greater among women in the middle quintile compared to the ones in richest and poorest wealth quintiles. Arifin E.N. (2003) women's education and residence affects contraceptive discontinuation or failure significantly. Residence in urban locations was related to a low probability of stopping contraceptives.

1.2. Statement of the problem

In addition to reducing unintended pregnancies, improving uptake of contraceptives improves child spacing, reduce the number of high-risk pregnancies, improves child survival. Despite all related benefits and the global initiatives to scale up FP, complications of pregnancy and childbearing continue to be a major reason for preventable maternal and child disease and deaths.

Besides, gross inequities exist between regions in the use of contraceptives. According to KDHS (2014), the unmet need for contraception is at 18%; it is greater among rural residents (20%) compared to urban residents (13%) and declines with increased literacy. In addition, unmet FP need is high among women aged 15 – 29 years; almost half (47%) of births among adolescents aged 15 – 19 years are unintended.

According to Anrudh *et al* (2013), close to two thirds of unintended births occur due to lack of contraceptive use while the other one third occurs due to discontinuation of contraceptives. Although there has been significant research on how various socioeconomic factors affect utilization of contraceptives in Kenya, very few studies have done an in-depth analysis on the linkage between reproductive behavior and autonomy of women. While the impact community level factors on reproductive behavior is documented, previous studies on how women's autonomy effects contraceptive use in Kenya have not isolated the contextual effects emerging from the position of women in the society. To address this methodological gap, the study applied a multilevel logit regression methodology allowing for analysis of contextual effects of the independent factors on contraceptive utilization.

1.3. Research Objective

The study's main objective was to assess how women's autonomy, at household and community level, affect use, discontinuation and unmet need for modern FP.

1.4. Research Questions

1. What are the trends of modern contraceptive use, unmet need for modern FP, and modern FP discontinuation in Kenya?
2. How does women's autonomy affect modern contraceptive use in Kenya?

3. How does women's autonomy affect unmet need for modern FP in Kenya?
4. How does women's autonomy affect modern FP discontinuation in Kenya?

1.5. Specific Objectives

1. To evaluate trends in use, discontinuation, and unmet need for modern FP in Kenya.
2. To establish how women's autonomy affects modern contraceptive use in Kenya.
3. To establish how women's autonomy affects unmet need for modern FP in Kenya.
4. To establish how women's autonomy affects modern FP discontinuation in Kenya.

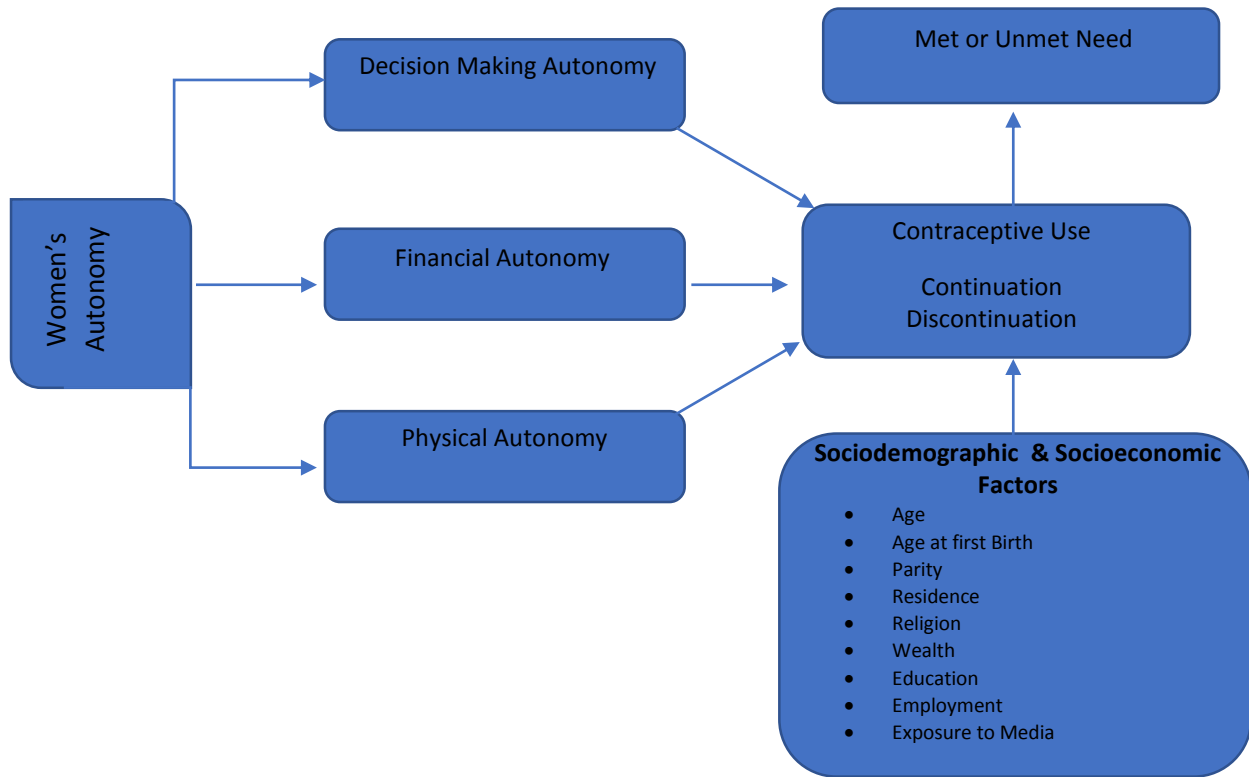
1.6. Significance of the Study

Spatial variations in contraceptive use, unmet need for FP and FP discontinuation persists. Because of the existence of significant geographical variations in contraceptive prevalence, discontinuation of modern FP and unmet need for FP across regions in Kenya, there is a growing interest for studies on how community factors affect health outcomes. Studying factors influencing contraceptive use goes a long way in providing rich evidence that can help to improve the Country's FP efforts. Specifically, identifying community factors influencing FP use helps to inform reproductive health programs' understanding of how community shapes contraceptive utilization. A better understanding of how contextual factors affects contraceptive informs development of community level programs and allow for better targeting of interventions.

1.7. Conceptual Framework

The decision of a woman to use, continue or discontinue contraceptives is affected by the woman's autonomy categorized as: a) Decision making autonomy; b) Financial Autonomy; and c) Physical Autonomy. In addition to the woman's autonomy, contraceptive behavior is also influenced by sociodemographic and socioeconomic factors including age, age at first birth, parity, residence, religion, wealth, education, employment status and exposure to media

Figure 1: Conceptual Framework



CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter presents available evidence as per the literature review conducted on the study area. The first part of the chapter describes the theoretical background of the study while the second section provides an empirical review of what is known about effects of wealth on contraceptive use from previous studies. The final part of the chapter outlines the conceptual framework and hypotheses to be tested by the study.

2.2. Theoretical Review

The foundation of this study was laid on the following models.

2.2.1. Grossman Model

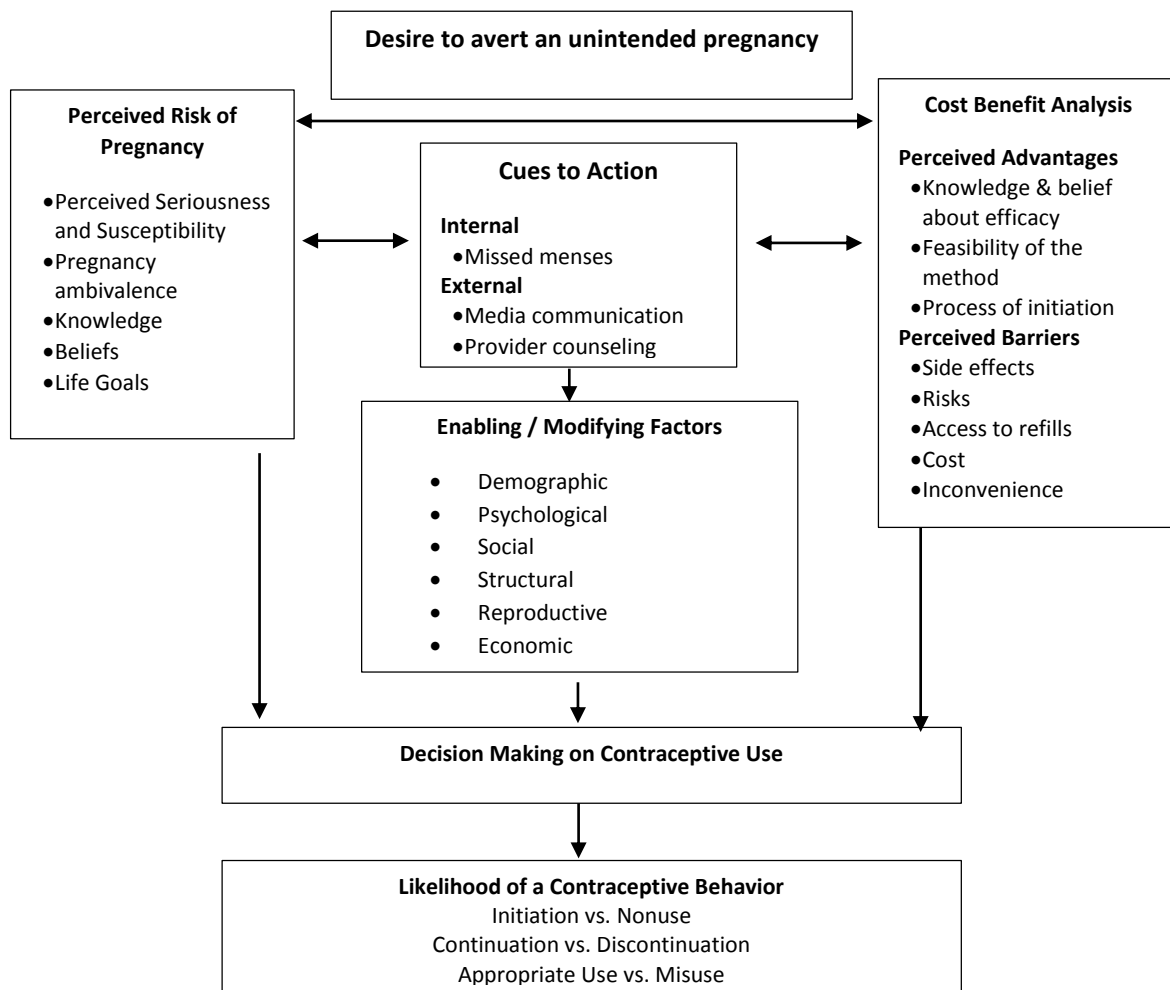
According to Grossman (1972), consumers both demand and produce health; consumers demand health as a consumption product and as an investment. On one hand, individuals demand health to derive utility. On the other hand, health is a component of human capital stock that helps in production healthy time. A person's stock of health controls the amount of time spent in production. Besides, a person inherits an initial health stock which depreciates as he/she grows older and increases with more investment in health; a person dies when the health stock goes lower than a particular level. The ideas brought out in the Grossman's model stand true when demand for contraceptive health services is considered; women demand and utilize reproductive health services to improve child spacing which reduces the number of high-risk births thus the mother's health. Improved fertility control gives women greater opportunity to acquire skills that increase their earnings and allows them to accumulate more physical assets.

2.2.2. The Health Belief Model (HBM)

HBM, which was developed by Rosenstock et al, can be used to explain variations in women's contraceptive behavior (Hall, 2012). Contraceptive behavior encompasses decision making and action of using contraceptive methods and includes actions like initiating contraceptives, continuation or stopping, contraceptive misuse, contraceptive nonuse, and adherence. The postulates that human beings are rational and consider different issues when making decisions and/or taking action on their health.

When applied to contraceptive behavior, Health Belief Model has the following constructs: 1. Perceived threat of unwanted pregnancy as well as perception of the seriousness of pregnancy motivates the use of contraceptives; 2. Cost-Benefit Analysis is the assessment of perceived barriers against the benefits of using contraceptives; 3. Cues to Action what trigger the use of contraceptives.; and 4. Modifying and/or Enabling Factors interact with the person's perceptions about pregnancy to influence use of contraceptives.

Figure 2: The Health Belief Model



2.3. Empirical Review

2.3.1. Economics of Fertility

Fertility, for individuals, reflects the extent to which people have the ability to make their own decisions about their ideal number of children, when to have them, and the spacing of pregnancies. For societies, fertility becomes important because it can impede or accelerate progress towards greater prosperity, equitable and sustainable development, and well-being for all. There are three categories of factors that influence fertility decisions: 1. Desired family size; 2. Occurrence of death which causes a compensating response to maintain a desired family size; and 3. Uncertainty in the family growth process. These factors determine the preferred birth rate and have effects on the woman's reproductive behavior (Schultz, 1969).

2.3.2. Socioeconomic Inequality and Modern Contraceptive Use

Many Sub Saharan countries have significant geographical differences in utilization of modern FP. Fotso et al (2013) established that between 1993 and 2003, modern Contraceptive Prevalence Rate (CPR) among the rural poor increased from 20% to 31% and stagnated around 50% among those who are rich and reside in urban regions. In addition, in 1993, rich women who reside in urban regions were 2.4 times more likely to use modern FP methods than the poor ones; the ratio reduced to 2.0 in 1998 and 1.6 in 2003.

Fotso et al (2013) also found out that the likelihood of using Long Acting Reversible Contraceptives (LARCs) was higher among the rich and educated as compared to their poor and less educated counterparts. The association between wealth status, education level and seeking contraceptive services from the private sector was found to be positive; urban rich and educated were about two times as likely to access contraceptives from the private sector than the urban poor. According to Darteh et al (2019), women living in the poorest, middle, and richer wealth quintiles have less likelihood of making decisions their sexual and reproductive health when compared to those in the richest wealth quintile. According to Awiti (2014), poverty lowers the likelihood of visiting a qualified service provider other factors held constant. In addition, residence in rural areas increases probability of visiting traditional health providers. These findings corroborate those of Rahman et al (2011) which show the probability of accessing reproductive care from trained service providers increased with the increase in mother's wealth quintile.

2.3.3. Role of Place and Community in Shaping Individual's Reproductive Health Behavior

Because individuals live in communities there is usually an intersection between personal beliefs and community social norms thus communities influence individual health behavior. According to Dynes et al (2012), geographical location plays an crucial role in shaping individual's sexual and reproductive health through different routes: through availability of health facilities giving information, products and services; through the sociodemographic and socioeconomic factors that enhances or bars people from accomplishing their reproductive health goals, and through setting of norms regarding reproductive health desires. Effects of place on contraceptive utilization in Kenya is evidenced by the geographical disparity in contraceptive prevalence rates, total fertility rates, and unmet need for FP.

2.3.4. Women's Autonomy and Reproductive Health Behavior

The influence autonomy has on women's reproductive health behavior is documented. According to Wado (2013), the likelihood of a woman being involved in making decisions in her household is higher among those with the highly educated ones, those in the richest wealth quintile, those residing in urban settings, those in employment and those exposed to media. Various studies have shown a strong linkage between participation of women in decision making and use of contraceptives (Adhikari, 2016; Ejembi et al, 2015; Wado, 2013; Saleem and Bobak, 2005)

2.3.5. Socioeconomic Factors and Contraceptive Use

Various studies have been done to examine how socioeconomic factors influence contraceptive use. The studies outline the effects in terms of individual/household and contextual socioeconomic factors.

At individual level, studies have found that contraceptive uptake increased with the rise in education and wealth status. The studies also show an increase Total Fertility Rate (TFR) with a reduction in education and wealth status (Stephenson, 2017; Adebawale et al, 2016; Kaggwa, 2008). At community level, studies have shown positively significant effect of community level wealth/poverty on women's contraceptive decisions. Moreover, the studies show that contextual effects of community wealth are higher in rural areas than urban locations. (Dias and de Oliveira, 2012; Dias and de Oliveira, 2015; Stephenson et al, 2007). These findings signify that persistent difference in contraceptive prevalence rates between regions could mainly be propelled by the difference in women's status within the different regions.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

The chapter covers the study design, variables, study population, data source, and data analysis methods.

3.1 Study Area

This research was conducted in Kenya, a country located in East Africa. Administratively, Kenya is subdivided into 47 counties with each county further subdivided into sub counties. According to KNBS 2019 projections to have a population of 52.21 million people. The economic activities vary from County to County with agriculture being the main economic activity in the rural areas.

3.2 Study Population

The study's target population was adolescents and women in the reproductive age bracket (15-49 years).

3.3 Study Design

A pooled cross-sectional designed was used in the study. Cross sectional study designs are used when measuring exposure and outcome at the time thus it is possible to measure the association between exposure and outcome.

3.4 Data Source

Secondary datasets from the 2003, 2008/9, and 2014 Kenya Demographic and Health Surveys were utilized in the study. The surveys are household based and used two stage sampling where clusters or primary sampling units (PSU) were sampled first then households identified from the clusters. The data was collected through the woman's questionnaire in the DHS tools together with the contraceptive calendar, which is a tool used to take retrospective history of women's pregnancy, births, terminations and history of contraceptive use. Approval was obtained from the

DHS Program to utilize the data. No ethical clearance was sought since the study utilized secondary data.

3.5 Study Sample

The study's sample size is presented in Table 2 below. A total of 46,482 respondents were included: 2014 KDHS, 30,314 (65.2%); 2008/09 KDHS, 8,256 (17.8%); and 2003 KDHS, 7,912 (17.0%).

Table 2: Sample Size

Survey Year	Sample size	Percentage
2003	7,912	17.0
2008/09	8,256	17.8
2014	30,314	65.2
Total	46,482	100.0

3.6 Study Variables

3.6.1 Dependent Variables

Study's main dependent variable was modern contraceptive use, a binary variable which was coded as "Yes" for respondents currently using modern FP (condoms, pills, lactational amenorrhea method, injections, pills, IUCDs, Implants, and female sterilization) "No" for those not using modern contraceptive methods. Other dependent variables in the study were unmet need for FP, and FP discontinuation.

3.6.2 Independent Variables

The explanatory variables were defined at individual and cluster level. At individual level the key independent variable was the woman's level of autonomy. This variable was established through measuring the women's engagement in household decisions. DHS Woman's Questionnaire has questions on who usually decides: 1. About healthcare for the respondent; 2. About purchasing major household assets; and 3. Visit to the respondent's family or relatives. Responses to these questions, according to the DHS Woman's Questionnaire, are categorized as: 1. Respondent; 2.

Husband/partner; 3. Jointly with Husband/partner; 4. Someone else; and 5. Other. Autonomy index was generated using Additive Index based on the responses.

Table 3: Definition and measure of Independent variables

Variables	Measures
Individual Level Independent Variables	
Woman's age	Coded as 15-19Yrs, 20-24Yrs, 25-29Yrs, 30-34Yrs, 35-39Yrs, 40-44Yrs, 45-49Yrs, and Above 49Yrs
Woman's age at first birth	Coded as 15-19Yrs, 20-24Yrs, 25-29Yrs, 30-34Yrs, 35-39Yrs, 40-44Yrs, 45-49Yrs, and Above 49Yrs
Current Marital Status	Coded as not married or married
Woman's education	Coded as no education, primary, secondary, and higher
Religion	Coded as roman catholic, Protestant, Muslim, no religion, and other
Living Children	Total number of living children
Age of partner/husband	Coded as 15-19Yrs, 20-24Yrs, 25-29Yrs, 30-34Yrs, 35-39Yrs, 40-44Yrs, 45-49Yrs, and Above 49Yrs
Husband/Partner Education	Coded as no education, primary, secondary, and higher
Wealth Quintile	Coded as poorest, poorer, middle, rich, and richest
Woman's Autonomy	A variable measuring woman's engagement in three household decision-making areas: healthcare, household purchases, and visiting of families.
Community Level Independent Variables	
<ol style="list-style-type: none"> 1. Residence (rural or urban) 2. Cluster women's autonomy level 3. Cluster poverty level 4. Cluster women's education 5. Cluster fertility norms 6. Cluster level of partner's education 	

Other individual level explanatory variables included woman's wealth status, education, and age. Household variables included wealth, and husband/partner education. At community level, the response variables of interest were cluster women's autonomy. Other cluster level independent

variables included: residence (rural or urban), region, community poverty level, level of women's education, fertility norms, and level of partner's education.

3.7 Data Analysis

Data was analyzed using Multilevel Logistic Regression Model. Multilevel models are designed to analyze data that is structured in a hierarchical manner. A hierarchy is made up of lower/micro level observations nested within higher/macro level observations. (Kreft and Leeuw, 1998). In this study, the independent variables were measured in a hierarchical manner. In the example of Women are nested within communities (clusters):

- Level-1 variables, such as individual woman characteristics e.g. age, education, employment status etc.
- Level-2 variables, such as cluster i.e. community level variables e.g. average community wealth, cluster women's autonomy cluster poverty level, cluster level of women's education cluster level fertility norms and cluster level of partner's education

Our general linear hierarchical Level 1 equation is given by:

$$Y_{ij} = \beta_{0j} + \beta_{1j}X_{1ij} + \varepsilon_{ij} \quad (1)$$

This is Level 1 regression equation and denotes the simplest possible state with one explanatory variable (X). Where:

Y_{ij} the binary dependent variable for woman (i) within cluster (j)

X_{1ij} the explanatory variable for woman (i) within cluster (j)

β_{0j} is the intercept of the dependent variable in cluster (j)

β_{1j} is the slope of the relationship in cluster (j) between the predictor at level and the dependent variable

ε_{ij} is the random errors of the forecast for level 1 equation (micro-errors)

Level 2 Equations

The dependent variables are the intercepts and the slopes for the independent variables at Level 1 in the groups of Level 2.

$$\beta_{0j} = \gamma_{00} + \gamma_{01}W_{1j} + u_{0j} \quad (2)$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}W_{1j} + u_{1j} \quad (3)$$

γ_{00} This is the general intercept, which is the overall average of scores on the response variable (contraceptive use) in all the clusters (communities) when the response variables are equal to zero.

W_{1j} Level 2 explanatory variables

γ_{01} this is overall slope or regression coefficient between response variable (contraceptive use) and level 2 explanatory variable

γ_{10} this is overall regression coefficient or slope between response variable (contraceptive use) and level 1 explanatory variable

u_{0j} this is the random error of the deviation of the group's intercept from the overall intercept

u_{1j} the error component of the slope i.e. deviation of the group slopes from the overall slope

Assuming normal distribution of the individual level analysis errors and multinormal distribution of cluster (community) level errors the general multilevel model is gotten by substituting equations (2) and (3) for equation (1):

$$Y_{ij} = \gamma_{00} + \gamma_{01}W_{1j} + \gamma_{10}X_{1ij} + \gamma_{11}X_{1ij}W_{1j} + (u_{0j} + X_{1ij}u_{1j} + \varepsilon_{ij}) \quad (4)$$

Ignoring community level variables, we remain with a random effects model below

$$Y_{ij} = \gamma_{00} + \gamma_{01}W_{1j} + \gamma_{10}X_{1ij} + (u_{0j} + X_{1ij}u_{1j} + \varepsilon_{ij}) \quad (5)$$

Model 1: Assesses the how individual characteristics affect use of, discontinuation, and unmet need for modern FP, thus includes only individual level independent variables.

Model 2: Assesses how community factors use of, discontinuation, and unmet need for modern FP, thus includes only the community level independent variables.

Model 3: Assesses combined effects of individual and cluster level independent variables on use of, discontinuation, and unmet need for modern FP.

CHAPTER FOUR: RESULTS

4.1. Sample Characteristics

Distribution of sample by background characteristics is presented on Table 4 below. A majority of women were aged below 39 years (83%) with an even distribution across the age groups; had their first birth at age of 20-24years (57.2%); were married (61.0%); had given birth to and had less than 3 living children (55.6% and 57.8% respectively); had attained primary level of education (51.2%); were protestants (63.6%), lived in rural areas (64.5%), and participated in key household decision (79.8%). On the other hand, a majority of the husbands (67.2%) were aged above 49years and had attained primary level of education (45.3%). There is a proportional distribution of wealth quintile with each Wealth Index having close to 20% of the sample.

Table 4: Percent Distribution of Sample by Background Characteristics

Background Characteristics	Total	
	No.	%
woman's age		
15-19Yrs	9,334	20.1
20-24Yrs	8,498	18.3
25-29Yrs	8,533	18.4
30-34Yrs	6,620	14.2
35-39Yrs	5,575	12.0
40-44Yrs	4,434	9.5
45-49Yrs	3,488	7.5
Total	46,482	100.0
age at first birth		
15-19Yrs	2,057	6.3
20-24Yrs	18,571	57.2
25-29Yrs	11,861	36.5
Total	32,489	100.0
current marital status		
Not Married	18,128	39.0
Married	28,354	61.0

Total	46,482	100.0
ideal number of children		
<3	7,376	15.9
3-4	14,355	30.9
4-6	7,379	15.9
7-8	1,439	3.1
>9	15,933	34.3
Total	46,482	100.0
number of living children		
<3	26,621	57.8
3-4	10,980	23.9
4-6	5,671	12.3
7-8	2,433	5.3
>9	323	0.7
Total	46,028	100.0
woman's education		
no education	6,598	14.2
primary	23,789	51.2
secondary	12,294	26.4
higher	3,801	8.2
Total	46,482	100.0
partner/husband's education		
no education	3,089	14.3
primary	9,770	45.3
secondary	6,335	29.3
higher	2,393	11.1
Total	46,482	100.0
religion		
roman catholic	9,551	20.6
Protestant	29,497	63.6
Muslim	6,382	13.8
no religion	841	1.8
Other	126	0.3

Total	46,397	100.0
residential area		
Rural	29,993	64.5
Urban	16,489	35.5
Total	46,482	100.0
participates in key household decisions		
no	4,373	20.2
Yes	17,316	79.8
Total	21,689	100.0
wealth index		
Poorest	10,143	21.8
Poorer	8,394	18.1
Middle	8,528	18.3
Richer	8,884	19.1
Richest	10,533	22.7
Total	46,482	100.0

4.2. Trends in Use of, Discontinuation, and Unmet Need for Modern FP in Kenya

Figures 3 to 8 below present trends in use, discontinuation and unmet need for modern FP among women aged 15-49years between 2003 and 2014.

Figure 3: Modern Contraceptive Use (2003 to 2014 Trends)

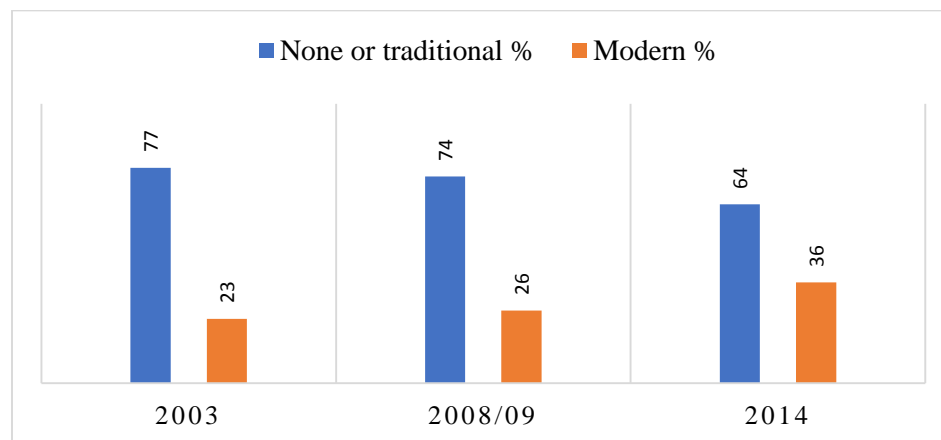


Figure 3 above shows that there has been a steady growth in utilization of modern FP from 23% (2003) and 26% (2008/09) to 36% in 2014.

Figure 4: Unmet Need for Modern FP (2003 to 2014 Trends)

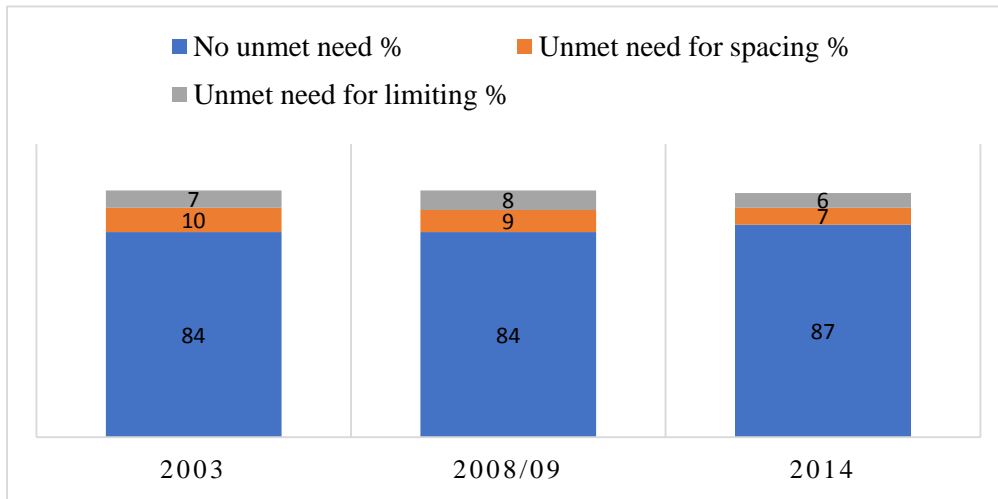


Figure 4 above shows that the total unmet need for modern FP has been steadily decreasing from 17% (2003) to 13% (2014) with the proportion of women whose need for spacing is unmet being greater than those with unmet need for limiting.

Figure 5: Trends of Modern FP discontinuation in Kenya (2003 to 2014)

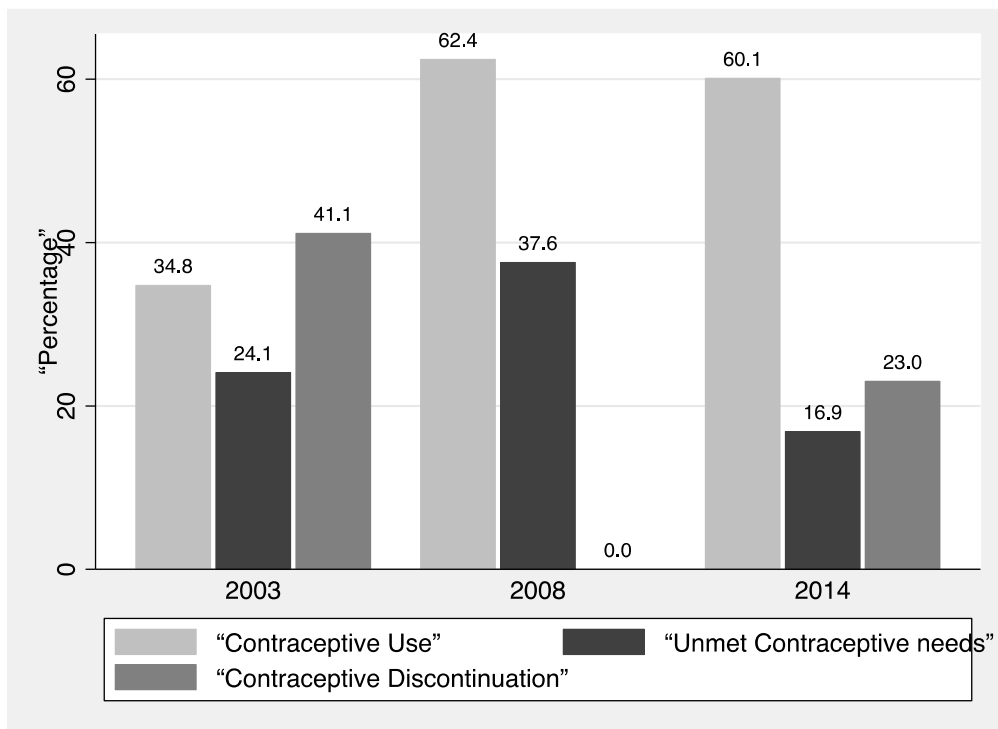


Figure 5 above shows a decrease in the rate of FP discontinuation from 41.1% in 2003 to 23.0% in 2014. The decrease in FP discontinuation rate is consistent with the decrease in unmet need for FP which also decreased from 24.1% in 2003 to 16.9% in 2014.

Figure 6: Contraceptive use by women’s level of education (2003 to 2014)

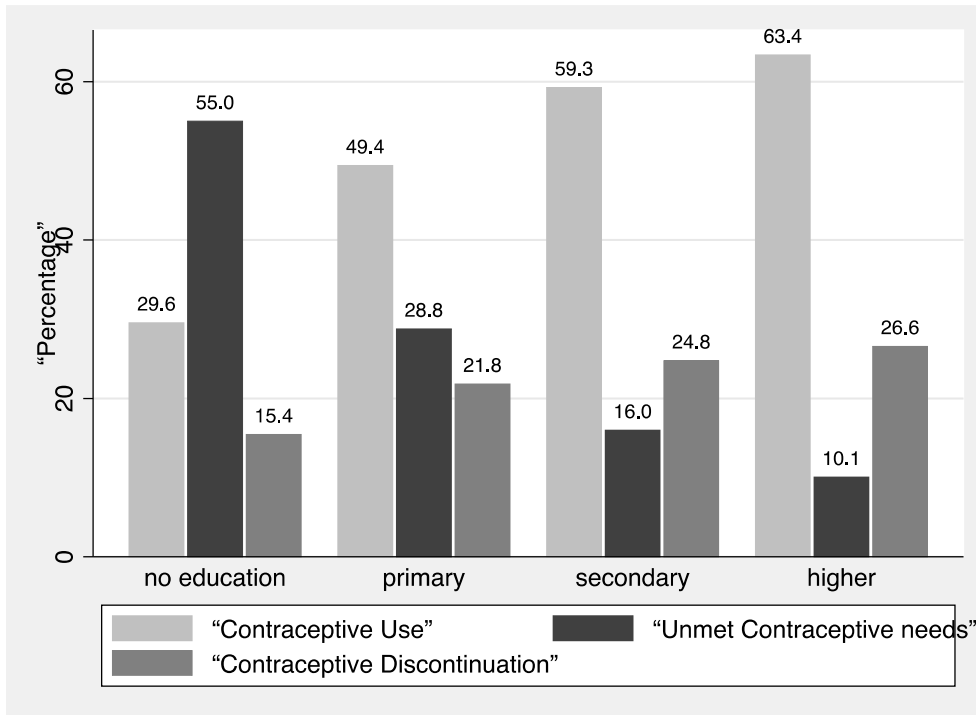


Figure 6 above shows an increase in uptake of modern FP and a reduction in unmet need with a rise in women’s level of education. However, with the improvement in woman’s education, a rise in FP discontinuation is observed.

Figure 7: Contraceptive use by household wealth status (2003 to 2014)

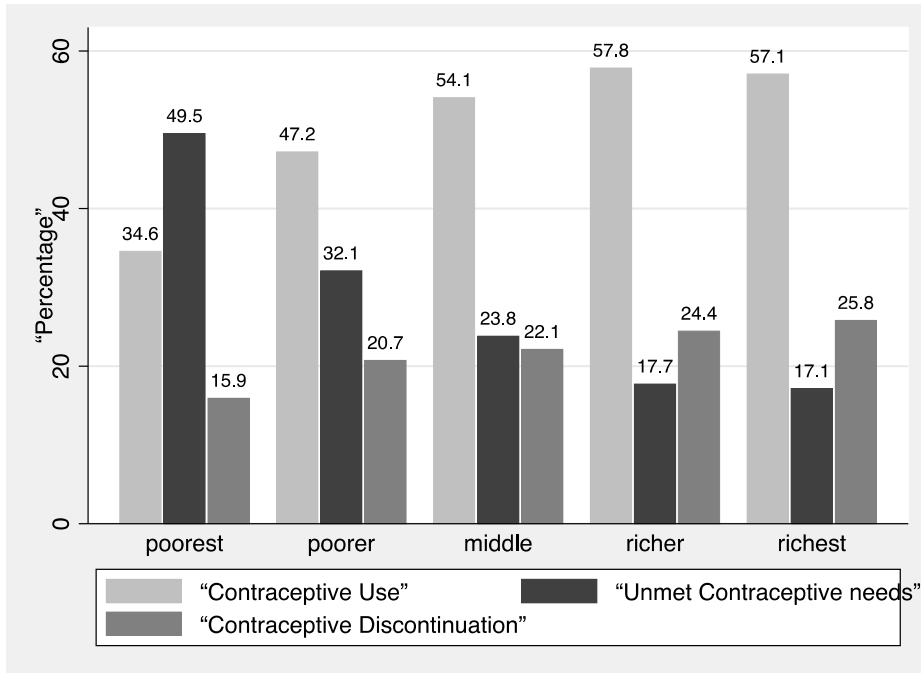


Figure 7 above shows that with a rise in woman’s wealth status, utilization of contraceptives increases while unmet need drops. However, there is a slight rise in rates of discontinuation with the improvement in woman’s wealth status.

Figure 8: Contraceptive use by location of residence (2003 to 2014)

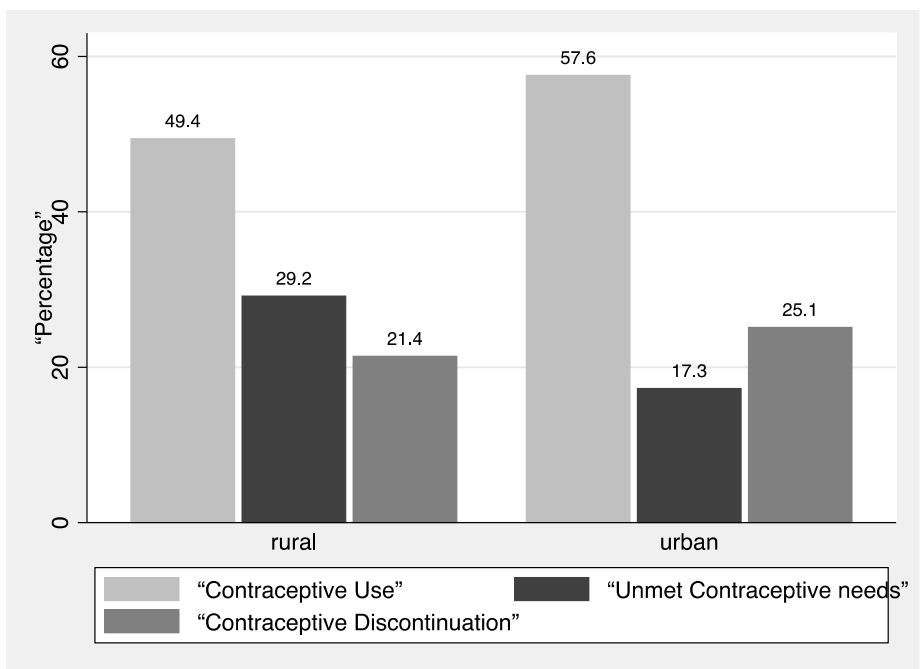


Figure 8 above shows that when urban areas have higher rates of contraceptive uptake and reduced unmet need for FP compared to rural locations. On the other hand, the rates of FP discontinuation are lower in rural settings compared to urban ones.

4.3. Determinants of Modern Contraceptive Use in Kenya

Distribution of modern FP use according to sample characteristics is shown in Table 5 below. There is evident variation in current uptake of modern FP when samples sociodemographic characteristics is considered. Rate of current use of modern FP was greater among women aged 25-29years (41.8%), 30-34years (45.8%), and 35-39years (43.0%). Women aged 15-19years (6.7%) had lowest proportion of modern contraceptive users. A higher proportion of use of modern contraceptive was observed in women who had their first coitus at the age of 25-29years (44.2%), first birth at the age of 25-29years (43.7%), women who were married (42.8%), women who had given birth to and/or had 3-4 living children (47.6%), women who had attained higher education (41.5%). Moreover, the proportion of modern contraceptive users was slightly greater among protestants (36.5%) compared to roman catholic (32.6%) and those residing in urban locations (35.7%) compared to those in rural residence (29.6%). Women who reported to participate key household decisions had higher rate of modern contraceptive uptake (40.6%) compared to ones who participated in no decision (17.4%).

Table 5: Modern Contraceptive Use by Sample Characteristics

	Use of Modern Contraceptive					
	none or traditional		modern		Total	
	No.	%	No.	%	No.	%
woman's age						
15-19Yrs	8,704	93.3	630	6.7	9,334	20.1
20-24Yrs	6,033	71.0	2,465	29.0	8,498	18.3
25-29Yrs	4,966	58.2	3,567	41.8	8,533	18.4
30-34Yrs	3,586	54.2	3,034	45.8	6,620	14.2
35-39Yrs	3,179	57.0	2,396	43.0	5,575	12.0
40-44Yrs	2,709	61.1	1,725	38.9	4,434	9.5
45-49Yrs	2,535	72.7	953	27.3	3,488	7.5
Total	31,712	68.2	14,770	31.8	46,482	100.0

age at first birth						
15-19Yrs	1,431	69.6	626	30.4	2,057	6.3
20-24Yrs	10,949	59.0	7,622	41.0	18,571	57.2
25-29Yrs	6,674	56.3	5,187	43.7	11,861	36.5
Total	19,054	58.6	13,435	41.4	32,489	100.0
current marital status						
not married	15,489	85.4	2,639	14.6	18,128	39.0
married	16,223	57.2	12,131	42.8	28,354	61.0
Total	31,712	68.2	14,770	31.8	46,482	100.0
ideal number of children						
<3	4,676	63.4	2,700	36.6	7,376	15.9
3-4	9,445	65.8	4,910	34.2	14,355	30.9
4-6	6,025	81.7	1,354	18.3	7,379	15.9
7-8	1,280	89.0	159	11.0	1,439	3.1
>9	10,286	64.6	5,647	35.4	15,933	34.3
Total	31,712	68.2	14,770	31.8	46,482	100.0
number of living children						
<3	20,048	75.3	6,573	24.7	26,621	57.8
3-4	5,754	52.4	5,226	47.6	10,980	23.9
4-6	3,527	62.2	2,144	37.8	5,671	12.3
7-8	1,752	72.0	681	28.0	2,433	5.3
>9	264	81.7	59	18.3	323	0.7
Total	31,345	68.1	14,683	31.9	46,028	100.0
woman's education						
no education	6,035	91.5	563	8.5	6,598	14.2
primary	15,370	64.6	8,419	35.4	23,789	51.2
secondary	8,082	65.7	4,212	34.3	12,294	26.4
higher	2,225	58.5	1,576	41.5	3,801	8.2
Total	31,712	68.2	14,770	31.8	46,482	100.0
partner/husband's education						
no education	2,845	92.1	244	7.9	3,089	14.3
primary	5,878	60.2	3,892	39.8	9,770	45.3
secondary	3,407	53.8	2,928	46.2	6,335	29.3
higher	1,205	50.4	1,188	49.6	2,393	11.1

Total	13,335	61.8	8,252	38.2	21,587	100.0
Religion						
roman catholic	6,434	67.4	3,117	32.6	9,551	20.6
protestant	18,737	63.5	10,760	36.5	29,497	63.6
muslim	5,697	89.3	685	10.7	6,382	13.8
no religion	705	83.8	136	16.2	841	1.8
other	86	68.3	40	31.7	126	0.3
Total	31,659	68.2	14,738	31.8	46,397	100.0
residential area						
rural	21,117	70.4	8,876	29.6	29,993	64.5
urban	10,595	64.3	5,894	35.7	16,489	35.5
Total	31,712	68.2	14,770	31.8	46,482	100.0
participates in key household decisions						
no	3,613	82.6	760	17.4	4,373	20.2
yes	10,286	59.4	7,030	40.6	17,316	79.8
Total	13,899	64.1	7,790	35.9	21,689	100.0
wealth						
poorest	8,546	84.3	1,597	15.7	10,143	21.8
poorer	5,568	66.3	2,826	33.7	8,394	18.1
middle	5,339	62.6	3,189	37.4	8,528	18.3
richer	5,521	62.1	3,363	37.9	8,884	19.1
richest	6,738	64.0	3,795	36.0	10,533	22.7
Total	31,712	68.2	14,770	31.8	46,482	100.0

Considering the husband/partner's highest education attainment, higher rates of modern contraceptive uptake was observed in women whose husbands had achieved higher education (49.6%) followed by secondary education (46.2%); women whose husbands had no education had the least proportion of users of modern FP (7.9%).

Findings of multilevel logistic regression analysis of relationship between explanatory factors and use of modern FP are summarized in Table 6 below. Model 1 outlines findings of individual level variables; model 2 presents result of cluster level variables; while model 3 covers both individual and cluster level variables. The analysis identified a number of individual and cluster level factors influencing contraceptive use in Kenya. Autonomy, age, wealth status, education level, number of

living children, religion, preferred number of children, marital status, and partner's education had statistically significant association with use of modern contraceptive, at individual level. The likelihood of using modern FP increased with increase in women's autonomy. Compared to those reporting no involvement in key household decisions, women who took part in making key household decision had higher odds of using modern FP (OR=1.5). Women in middle, richer and richest wealth quintile had more than double likelihood of using modern FP (OR=2.1, 2.3, and 2.3 respectively) compared to those in poorest quintile. Similarly, women's attainment of primary education or higher increased the likelihood of modern contraceptive uptake (OR=2.2 – 2.9).

Compared to those aged 15-19 years, women aged 25 to 44 years had more likelihood of using modern FP (OR=1.2 - 1.5). Similarly, compared to the unmarried, married women had higher odds of modern contraceptive uptake (OR=3.1). Women who had between four (4) and eight (8) living children had more likelihood of using modern FP (OR=1.4-1.6) when compared to those having less than three (3) living children. However, the likelihood of a woman using modern FP steadily declined as the preferred number of children increased. Compared Roman Catholics, the likelihood of protestants using modern FP was higher (OR=1.2) while that of Muslims was lower (OR=0.5)

Among cluster variables, residential area, region, cluster women's autonomy, cluster poverty, and cluster women's education were significantly associated with use of modern FP. Women living in clusters with a high women autonomy level had higher odds of modern contraceptive use (OR=4.3). Similarly, living in clusters with more women who had attained secondary or higher raised women's prospect of using modern FP by 70% (OR=1.7). Living in a cluster with a higher poverty levels reduced the odds of modern contraceptive use by 42% (OR=0.58).

In model 3, the following individual level factors still had significant association with use of modern FP: woman's autonomy, wealth status, age, education, living children, marital status, religion, partner's education, and preferred number of children. Similarly, the following cluster level variables had significant association with modern contraceptive use: cluster level of autonomy, residence, and cluster level of parity. The direction of association between the explanatory factors and use of modern contraceptive remained the same although there were some slight variations in the level of significance and strength of association.

Table 6: Determinants of Contraceptive Use in Kenya – Multilevel Logistic Regression

VARIABLES	Model 1		Model 2		Model 3	
	OR	SE	OR	SE	OR	SE
Contraceptive Use						
Women's Autonomy: Participates in Key Household Decisions (Ref: No)						
Yes	1.47***	(0.09)			1.23***	(0.07)
Wealth (Ref: Poorest)						
Poorer	1.64***	(0.12)			1.52***	(0.11)
Middle	2.06***	(0.15)			1.74***	(0.13)
Richer	2.35***	(0.18)			1.82***	(0.15)
Riches	2.28***	(0.18)			1.59***	(0.15)
Woman's Age (Ref: 15-19Yrs)						
20-24Yrs	1.25*	(0.15)			1.18	(0.14)
25-29Yrs	1.54***	(0.19)			1.34**	(0.16)
30-34Yrs	1.54***	(0.20)			1.29**	(0.16)
35-34Yrs	1.49***	(0.20)			1.20	(0.16)
40-44Yrs	1.54***	(0.21)			1.18	(0.16)
45-49Yrs	0.80	(0.12)			0.59***	(0.09)
Age at first birth (Ref:15-19Yrs)						
20-24Yrs	1.08	(0.09)			1.10	(0.09)
25-29Yrs	1.15	(0.10)			1.15	(0.10)
Woman's Education (Ref: No Education)						
Primary	2.16***	(0.19)			1.90***	(0.17)
Secondary	2.57***	(0.25)			2.27***	(0.22)
Higher	2.87***	(0.35)			2.56***	(0.31)
Number of Living Children (Ref:<3)						
3-4	1.64***	(0.08)			1.79***	(0.09)
4-6	1.58***	(0.11)			1.89***	(0.13)
7-8	1.40***	(0.13)			1.78***	(0.18)
>9	0.86	(0.21)			1.13	(0.28)
Ideal Number of Children (Ref: <3)						

3-4	0.66***	(0.03)	0.67***	(0.03)
4-6	0.38***	(0.02)	0.42***	(0.03)
7-8	0.32***	(0.04)	0.34***	(0.04)
Current Marital Status (Ref: Not Married)				
Married	3.14***	(0.36)	3.09***	(0.37)
Religion (Ref: Roman Catholic)				
Protestant	1.17***	(0.06)	1.20***	(0.06)
Muslim	0.54***	(0.05)	0.58***	(0.06)
No Religion	0.66**	(0.12)	0.64**	(0.11)
Other	0.69	(0.19)	0.70	(0.19)
Partner's Education (Ref: No Education)				
Primary	2.42***	(0.27)	2.06***	(0.23)
Secondary	2.38***	(0.27)	2.11***	(0.24)
Higher	2.05***	(0.26)	1.84***	(0.23)
Level 2: Community/Cluster				
Residential Area (Ref: Rural)				
Urban			1.24***	(0.05)
			1.29***	(0.08)
Region (Ref: Nairobi)				
Central			2.10***	(0.19)
Coast			0.81**	(0.08)
Eastern			1.11	(0.11)
Nyanza			0.98	(0.10)
Rift Valley			0.74***	(0.07)
Western			1.02	(0.11)
North Eastern			0.05***	(0.01)
Cluster level of women's autonomy (Ref: Low)			4.33***	(0.60)
Cluster level of poverty (Ref: Low)			0.58***	(0.06)
Cluster women's education (Ref: No education or Primary)			1.73***	(0.27)
Cluster level fertility norms (Ref: Ideal No. of Children <4)			1.12	(0.15)
Cluster partner's education (Ref: No education or Primary)			1.07	(0.12)
			0.93	(0.15)

Constant	0.02***	(0.00)	0.13***	(0.02)	0.01***	(0.00)
ICC	0.05		0.07		0.04	
Observations	16,907		46,455		16,907	
Number of groups	1,586		1,590		1,586	

Robust seEform in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.4. Determinants of Unmet Modern FP Need in Kenya

Table 7 presents findings of multilevel logistic regression analysis of the relationship between unmet need for modern FP and explanatory factors. Autonomy, wealth status, age, age at first birth, education, number of living children, and marital status had significant association with unmet need for modern FP, at individual level. The prospect of a woman having an unmet need for modern FP decreased by 15% as the woman’s autonomy increased.

Autonomy was negatively associated with unmet need for modern FP. Compared to women who were not involved in household decisions, those that reported involvement in key household decisions had lower likelihood of unmet need for modern FP (OR=0.85), implying their FP needs were met.

Wealth status was also negatively correlated with unmet FP needs; compared to women in poorest quintile, those in the middle, richer and richest wealth quintile had a lower prospect of unmet need for modern FP (OR=0.6 – 0.7). Compared to those who had their first birth at the age of 15-19years, women who had first births at between the age of 20 to 29 year had higher prospects of having an unmet need for modern FP (OR=1.2).

There was a steady rise in the prospect of unmet need with the rise in woman’s age. Being married increased the likelihood unmet need by more than 5 times (OR=5.8). Among cluster level variables, after adjusting for individual level variables, type of residence, cluster women’s autonomy, and cluster women’s education had statistically significant association with unmet need for modern FP.

Women residing in urban locations had 17% lower likelihood of unmet need (OR=0.83) compared to rural residents. Residing in a cluster with degree of women’s autonomy reduced the prospects of unmet need for modern contraceptive use by 44% (OR=0.56). Similarly, living in a cluster with a higher proportion of women who have attained secondary education or higher decreased the likelihood of unmet need by 73% (OR=0.27).

In model 3, women’s autonomy was not significantly associated with unmet need for modern FP methods. However, the following individual level variables still retained significant association: wealth status, woman’s age, age at first birth, number of living children, and marital status. Likewise, cluster women’s autonomy still had significant association with unmet need as was cluster education level of women.

Table 7: Determinants of Unmet need for FP in Kenya – Multilevel Logistics Regression

VARIABLES	Model 1		Model 2		Model 3	
	OR	SE	OR	SE	OR	SE
Unmet Need						
Women’s Autonomy: Participates in Key Household Decisions (Ref: No)						
Yes	0.85***	(0.05)			0.95	(0.05)
Wealth (Ref: Poorest)						
Poorer	0.85**	(0.06)			0.87**	(0.06)
Middle	0.70***	(0.05)			0.76***	(0.06)
Richer	0.59***	(0.04)			0.67***	(0.06)
Richest	0.70***	(0.06)			0.84*	(0.09)
Woman’s Age (Ref: 15-19Yrs)						
20-24Yrs	0.71***	(0.08)			0.74***	(0.08)
25-29Yrs	0.42***	(0.05)			0.46***	(0.05)
30-34Yrs	0.34***	(0.04)			0.38***	(0.05)
35-34Yrs	0.29***	(0.04)			0.33***	(0.04)
40-44Yrs	0.27***	(0.04)			0.31***	(0.04)
45-49Yrs	0.23***	(0.03)			0.26***	(0.04)
Age at first birth (Ref:15-19Yrs)						

20-24Yrs	1.23**	(0.10)	1.24***	(0.10)
25-29Yrs	1.18*	(0.10)	1.22**	(0.11)
Woman's Education (Ref: No Education)				
Primary	1.26***	(0.10)	1.21**	(0.09)
Secondary	0.92	(0.09)	0.90	(0.09)
Higher	0.77*	(0.11)	0.76*	(0.11)
Number of Living Children (Ref:<3)				
3-4	1.63***	(0.09)	1.57***	(0.09)
4-6	2.56***	(0.19)	2.35***	(0.18)
7-8	3.81***	(0.37)	3.43***	(0.34)
>9	5.91***	(1.17)	5.28***	(1.05)
Ideal Number of Children (Ref: <3)				
3-4	1.15**	(0.06)	1.12*	(0.06)
4-6	1.14*	(0.08)	1.08	(0.08)
7-8	0.98	(0.11)	0.95	(0.11)
Current Marital Status (Ref: Not Married)				
Married	5.79***	(1.16)	6.07***	(1.23)
Religion (Ref: Roman Catholic)				
Protestant	0.91*	(0.05)	0.89**	(0.05)
Muslim	1.03	(0.09)	1.27**	(0.12)
No Religion	1.03	(0.14)	1.04	(0.14)
Other	1.18	(0.34)	1.24	(0.37)
Partner's Education (Ref: No Education)				
Primary	1.18*	(0.10)	1.13	(0.10)
Secondary	1.13	(0.11)	1.06	(0.10)
Higher	1.26*	(0.15)	1.18	(0.14)
Level 2: Community/Cluster				
Residence (Ref: Rural)				
Urban			0.83***	(0.04)
			0.92	(0.06)
Region (Ref: Nairobi)				
Central			0.52***	(0.06)
			0.62***	(0.08)
Coast			1.21*	(0.12)
			1.04	(0.13)
Eastern			0.90	(0.10)
			0.91	(0.11)

Nyanza	1.58***	(0.16)	1.58***	(0.19)
Rift Valley	1.36***	(0.14)	1.33**	(0.16)
Western	1.33***	(0.14)	1.40***	(0.17)
North Eastern	1.09	(0.15)	0.76	(0.14)
Cluster level of women's autonomy (Ref: Low)	0.55***	(0.07)	0.66**	(0.11)
Cluster level of poverty (Ref: Low)	1.09	(0.12)	0.87	(0.13)
Cluster level of women's education (Ref: No education or Primary)	0.27***	(0.05)	0.43***	(0.11)
Cluster level fertility norms (Ref: Ideal No. of Children <4)	0.79	(0.12)	0.78	(0.14)
Partner's education in the cluster (Ref: No education or Primary)	1.00	(0.15)	1.18	(0.21)
Constant	0.06***	(0.02)	0.40***	(0.06)
ICC	0.05		0.07	0.04
Observations	16,876		30,493	16,876
Number of groups	1,586		1,590	1,586

Robust seEform in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.5 Determinants of Modern FP discontinuation in Kenya

Results of the multilevel logistic regression analysis of the association between discontinuation of modern FP and various explanatory factors is presented in Table 8 below.

At the individual level, woman's autonomy level, preferred number of children, and wealth status, had significant association with modern FP discontinuation. Compared to those who reported no involvement in household decisions, autonomous women were 76% more likely to discontinue using modern FP. (OR=1.76). Besides, there was an upsurge in the prospects of modern FP discontinuation with the increase in woman's household wealth status and woman's age. Respondents in the richer and richest quintile were more than two times likely to stop using modern FP compared to the ones in the poorest wealth quintile (OR=2.4). Women who preferred having more than 3 children had higher likelihood of discontinuing contraceptives compared to those who preferred less than 3 children.

Among cluster level variables, after adjusting for individual level variables, area of residence, cluster level of women's autonomy, cluster poverty level, and cluster level fertility norms were had significant association with modern FP discontinuation.

Table 8: Determinants of FP discontinuation in Kenya – Multilevel Logistics Regression

VARIABLES	Model 1		Model 2		Model 3	
	OR	SE	OR	SE	OR	SE
Contraceptive Discontinuation						
Women's Autonomy: Participates in Key Household Decisions (Ref: No)						
Yes	1.76***	(0.21)			1.40**	(0.18)
Wealth (Ref: Poorest)						
Poorer	2.11***	(0.35)			1.76***	(0.29)
Middle	2.07***	(0.34)			1.66***	(0.28)
Richer	2.39***	(0.41)			1.87***	(0.35)
Riches	2.43***	(0.41)			1.55**	(0.33)
Age at first birth (Ref:15-19Yrs)						
20-24Yrs	0.66*	(0.16)			0.72	(0.17)
25-29Yrs	0.60**	(0.15)			0.66*	(0.16)
Number of Living Children (Ref:<3)						
3-4	1.06	(0.11)			1.10	(0.12)
4-6	0.82	(0.13)			0.88	(0.14)
7-8	0.60**	(0.13)			0.69*	(0.15)
>9	0.30**	(0.18)			0.40	(0.24)
Ideal Number of Children (Ref: <3)						
3-4	0.70***	(0.08)			0.71***	(0.09)
4-6	0.56***	(0.09)			0.56***	(0.09)
7-8	0.33***	(0.09)			0.31***	(0.09)
Current Marital Status (Ref: Not Married)						
Married	1.43**	(0.24)			1.22	(0.21)
Religion (Ref: Roman Catholic)						
Protestant	1.39***	(0.16)			1.40***	(0.16)
Muslim	1.38	(0.30)			1.02	(0.24)

No Religion	0.91	(0.35)		1.06	(0.40)
Other	0.66	(0.64)		0.63	(0.65)
Level 2: Community/Cluster					
Residential Area (Ref: Rural)					
Urban			1.49***	(0.17)	1.48*** (0.21)
Region (Ref: Nairobi)					
Central			1.80***	(0.36)	1.52* (0.37)
Coast			1.07	(0.23)	1.27 (0.36)
Eastern			0.85	(0.18)	0.82 (0.22)
Nyanza			1.87***	(0.43)	2.24*** (0.66)
Rift Valley			0.49***	(0.09)	0.43*** (0.11)
Western			1.08	(0.26)	1.09 (0.30)
North Eastern			-	-	-
Cluster level of women's autonomy (Ref: Low)			9.38***	(3.18)	7.19*** (2.91)
Cluster level of poverty (Ref: Low)			0.43***	(0.10)	0.53** (0.15)
Cluster level fertility norms (Ref: Ideal No. of Children <4)			7.49***	(2.81)	6.91*** (2.85)
Constant	3.14***	(1.05)	0.55*	(0.18)	0.44* (0.22)
ICC	0.17		0.15		0.14
Observations	5,056		6,480		5,032
Number of groups	1,319		1,367		1,306

Robust seEform in parentheses

*** p<0.01, ** p<0.05, * p<0.1

CHAPTER FIVE: DISCUSSION AND CONCLUSION

5.1. Discussion

Individual and cluster level factors influencing use, discontinuation and unmet need for modern FP in Kenya was assessed through multilevel regression analysis.

Among individual level, women's autonomy, wealth status and education were significantly associated with the use, discontinuation, and unmet need for modern FP use. These findings corroborate those of previous studies which showed that advancement in women's education, autonomy, and wealth status increased the likelihood of contraceptive use (Adebowale et al, 2016; Ejembi et al, 2015; Larsson and Stanfors, 2014; Wado et al, 2013; Moursund and Kravdal, 2013; Ahmed, et al 2010; Saleem and Bobak, 2005).

In addition, the findings are consistent with those of Ojaka, 2008 indicating that the unmet need for FP decreased with increase in women's education level, and wealth. Contrary to findings of the study by Arifin, 2003 indicating that women residing in urban settings had less likelihood of discontinuing contraceptives due to failure, the study showed that residence in an urban area increased the likelihood of modern FP discontinuation by 46% (OR=1.46). This could be linked to increased access to healthcare services in urban settings when compared to rural locations making it easy for residents of urban areas to discontinue use of modern FP whenever they need to do so.

At community level, the study found that residing in clusters with higher women autonomy levels increased the prospects of modern contraceptive use. These results are in line with previous studies which show positive association between the extent of women empowerment in a community and use of modern FP (Wado et al, 2013; Elfstrom and Stephenson, 2012). The study also established that the likelihood an unmet need for modern FP was lower among residents of urban locations compared to the rural inhabitants. This corroborate those of Dynes et al, 2012 which show a relationship between geographical location and individual's reproductive health decisions.

5.1. Policy Implications

Findings of this study increase available evidence on how autonomy influences improvement in reproductive health. The existence of both individual level and contextual association between autonomy and contraceptive use in Kenya calls for integration of women empowerment initiatives into reproductive health Programmes and vice versa. Reproductive Health policies need to be reviewed and/or updated to give clear guidance on multisectoral collaboration.

5.2. Study Strengths and Limitations

The study used secondary datasets from DHS; this presented both a strength and a challenge. The hierarchical nature of DHS data enabled utilization of Multilevel Analysis which not only examined individual level factors influencing use, discontinuation and unmet need for modern FP, but also the contextual effects. On the other hand, because DHS has a cross-sectional design not all respondents answered all the questions possibly due to recall challenges. Besides, it was not possible to make any inference on the causal relationship between the response variable and explanatory factors. Instead this study only estimated strength and significance of relationship between the explanatory factors and dependent variables.

5.3. Recommendations

In order to address a possible risk of recall bias and to enable assessment of causal relationship between the response variables and explanatory factors, the study recommends a future use prospective longitudinal methodology.

5.4. Conclusion

The study shows that use, discontinuation, and unmet need for modern FP is influenced not only by individual level factors but also community factors like the residential area, cluster women's autonomy and socioeconomic development. While a high degree of women's autonomy is associated with increased modern FP utilization and decreased unmet need, the same has an association with increased rates of discontinuation of modern FP. Reproductive Health Programmes in Kenya must therefore put more emphasis on improving the individual and collective position of women in communities in addition to increasing access to SRH services.

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