UNIVERSITY OF NAIROBI

DETERMINANTS OF CONTRACEPTIVE USE AMONG WOMEN OF REPRODUCTIVE AGE IN NORTH EASTERN KENYA.

BY

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A Thesis submitted to the University of Nairobi Institute of Tropical and Infectious Diseases (UNITID), for the partial fulfillment of the requirements for the degree of Master of Science in Medical Statistics.

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CERTIFICATE OF APPROVAL

This Thesis is my original work and it has not been submitted for an award of Master of Science in Medical Statistics.

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This Thesis has been submitted for the degree of MSc in Medical Statistics with my approval as a university supervisor.

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DEDICATION

This work is dedicated to the Almighty God for his wisdom and grace, my wife Anne and the entire family for their support and encouragement during my studies and subsequent writing of this report.

ABSTRACT

Background

Contraceptive use is the expression of individual desire to space or to limit birth.By practicing family planning, couples can improve the health of mothers and children through birth spacing and avoiding high risk pregnancies. In addition to this, family planning can help to slow down population growth thereby contributing to economic benefits such as poverty reduction. North Eastern Province has the lowest prevalence of contraceptive use in Kenya. The determinants of contraceptive use among women in this province are increasingly attracting attention from researchers and policy makers. However policies aimed at increasing uptake of contraceptives need to be based on a sound assessment of the sources, reasons and determinants of contraceptive use since policy decisions based on intuition are likely to be misguided.

Objectives

The study investigated the factors related to contraceptive use by women in North Eastern Province of Kenya. The specific objectives were;

1. To determine the methods of contraceptives available to women and their use in North Eastern Kenya
2. To determine the factors related to Contraceptive use by women of reproductive age in North Eastern Kenya

Methods

Data from Kenya Demographic and Household Survey (KDHS, 2008/09) was used for the analysis. The study design was a population based Cross Sectional Survey. Eligible women were 15 years or older but less or equal to 49 years old and resident in the province at the time of the survey. Sampling involved a two stage cluster design. Tables were used to present the methods of contraceptives available, their use by women and reasons for not using contraceptives. Logistic regression model was used to model the association of various covariates on Contraceptive use taking into account potential confounders.

Results

A total of 608 women who were 15 years or older but less or equal to 49 years old were included in the sample. Over 97.5% of the women were Muslims. The methods of contraceptives available were Pill, Injections and Norplant. Over 97.7% of the sample of women did not use any method of contraception. Only 1.48% used Injection method. 37.76% of the women indicated that the Muslim religion prohibits the use of contraceptives. Univariate Logistic regression models found associations between the covariates, residence, education, socioeconomic status, occupation religion and mass media on contraceptive use. Specifically, urban residents were more likely to use contraceptives compared with their rural counterparts. Women with primary, secondary and higher education were more likely to use contraceptives and the magnitude of effect increased with increasing level of education. Women who were exposed to media were more likely to use contraceptives compared to those who were not. Muslims were less likely to use contraceptives compared to Protestants. In the multivariate analysis only religion and watching television remained statistically significant. Muslims were 98.98% [Adjusted OR = 0.02, P < 0.003, 95% CI (0.002, 0.0267)] less likely to use contraceptives compared to protestants. Women who were accessible to television were about 10 times [Adjusted OR = 10.65, P = 0.031, 95% CI (1.23, 91.84)] more likely to use contraceptives compared to those who did not.

Conclusion

Religion and Mass media were significantly associated with Contraceptive use among women in North Eastern province of Kenya. Muslims were less likely to use contraceptives compared to Protestants. Women who were exposed to television were more likely to use contraceptives than those who were not. Involving Muslim leaders in design, planning and implementation of family planning programs in this province is critical for the success of family planning programs in the province.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
USAID	United States Agency for International Development
CPR	Contraceptive Prevalence Rate
TFR:	Total Fertility Rate
KDHS:	Kenya Demographic and Household Survey
NEP	North Eastern Province
KNBS	Kenya National Bureau of Statistics
HIV	Human Immunodeficiency Virus
NASSEP	National Sample Survey and Evaluation Programme
MDG	Millennium Development Goals
PCA	Principal Component Analysis
SES	Socio-Economic Status
UNITID	University of Nairobi Institute of Tropical and Infectious Diseases
IUD	Intra Uterine Device
HPI	Health Policy Initiative

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CHAPTER ONE: INTRODUCTION

1.0 Background of Contraceptive Use

Contraceptive use is the expression of individual desire to space or to limit birth.By practicing family planning, couples can improve the health of mothers and children through birth spacing and avoiding high risk pregnancies. In addition to this, family planning can help to slow down population growth thereby contributing to economic benefits such as poverty reduction [40].

An analysis of the contribution of family planning to the MDGs showed that satisfying unmet family planning needs in Kenya could avert 14,040 maternal deaths and 434,306 child deaths by the MDG target date of 2015 [30] . In USAID/HPI [39], it was noted that the cost savings in providing services to meet MDGs outweigh the additional costs of family planning by a factor of almost 4 to 1. Specifically, the social sector cost savings and family planning costs in Kenya for 2005-2015 are estimated at $271 millions, with maternal health taking $75 million, while water and sanitation, immunization and education each taking $36 million, $37 million and $115 million, respectively. This compares with the total cost of family planning estimated at $71million, which implies that total savings will be $200 million [40] .

Promotion of family planning in countries with high birth rates has the potential of reducing poverty and hunger, while at the same time averting 32 percent of all maternal deaths and nearly 10 percent of child mortality. This would contribute substantially to women's empowerment, achievement of universal primary schooling and long term environmental sustainability [10, 27]. Hawkins [14] observed that family planning services offer various economic benefits to the household, country and the world at large. First, family planning permits individuals to influence the timing and the number of births, which is likely to save lives of children. Secondly, by reducing unwanted pregnancies, family planning service can reduce injury, illness and death associated with child birth, abortions and sexually transmitted infections (STIs) including HIV/AIDS.

Every year almost 515,000 women die from problems linked to pregnancy and child birth, and approximately 30 more develop serious disabling problems. Family planning could prevent many of these deaths and much of this disability[40] .Unintended pregnancy is a worldwide problem that affects women, their families and society. Unintended pregnancy is associated with an increased risk of morbidity for women, and with health behaviours during pregnancy that are associated with adverse effects. For example, women with an unintended pregnancy may delay prenatal care, which may affect the health of the infant. Women of all ages may have unintended pregnancies, but some groups, such as teens, are at a higher risk [8.]

In order to reduce the population growth rate, as well as the risk of women and children and the poverty level of the society, contraceptives methods have been used as an effective measure in family planning all over the world. We must also step up efforts for family planning, which has a direct impact on maternal health [3] .The need for family planning is growing fast, and it is estimated that the 'unmet need' will grow by 40 percent during the next 15 years [39].

There are many methods of contraception, which have been used such as the oral pill, injection, condoms, intra uterine device, sterilization, Norplant, rhythm method, and withdrawal. According to the 2008-09 Kenya Demographic and Health Survey [19] , the contraceptive prevalence rate (CPR) for Kenya was 46 percent. Differences in CPR in 2008-09 indicate that Central region had the highest CPR of 67 percent followed by Nairobi and Eastern at 55 and 52 percent respectively. These are the only regions in Kenya where over half of the married women use contraception. Regions with the lowest CPR were Nyanza and Coast where about 33 percent of the married women use contraception and North Eastern where only 5 percent of the married women use contraception [19].

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

The relentless growth in population might seem paradoxical given that the world's average birth-rate has been slowly falling for decades. Humanity's numbers continue to climb because of what scientists call population momentum. As a result of unchecked fertility in decades past, coupled with reduced child mortality, many people are now in their prime reproductive years, making even modest rates of fertility yield huge population increases. This according to John Bongaarts[5] of Population Council in New York translates to adding more than 70 million people to the planet every year, which has been happening since the 1970s. The African continent is expected to double in population by the middle of this century, adding 1 billion people despite the ravages of AIDS and malnutrition [37].

Kenya's Total Fertility Rate (TFR) estimated at 8.1 in 1977/78 declined to 4.6 children per woman by 2008/9. This drop was largely attributed to increased practice of modern contraceptive methods over the time, and improved educational status of women. The contraceptive prevalence rate (all methods) rose sharply since the early 1980s; rising from 17% in 1984 to 33% in 1993 and to 39% of married women in 1998 and 46 percent in 2008/9 [19]. Demographic transition began to manifest in 1989, when population growth rate declined to 3.4 percent and further to 2.5 percent in 1999, but estimated at a higher level of 2.9 per cent in 2009. Owing to the past growth rates, Kenya's population is still youthful with nearly half being aged 18 years or below. This is a clear demonstration of *demographic momentum*- a phenomenon of continued population increase despite reducing fertility rates, which is brought about by waves of large populations of young persons entering reproductive age in successive years. This may in part explain the addition of one million people annually to Kenya's population referred to above, contributing to the "*youth* bulge [19].

Kenya's total fertility rate has declined from 6.7 births per woman in 1989 to 4.8 in 2003 [20]. However, even at this lower rate, the population of the country is doubling

approximately every 22 years. Nevertheless, while fertility rates remain high, the change over the last 25 years has been dramatic and positive.

Various researches suggest that the differences in contraceptive use can be explained by the following broad factors; socioeconomic, cultural and the impact of family planning programmes [3]. Evidence from research conducted in Kenya and elsewhere has provided empirical evidence to support these suggestions [4.] .The specific factors that influence contraceptive use include the following; Education, Wealth status, Residence, Religion, Knowledge of family planning, Desire for more children, Number of living children, and Death of a child [5].

It is evident that Central, Nairobi, and Eastern regions which have the highest contraceptive prevalence in the country also have the lowest proportion of the population in the lowest wealth quintile representing less than 3 percent of their respective populations. On the other hand, North Eastern and Coast regions, which have the lowest contraceptive prevalence rates have also the highest proportion of the population in the lowest wealth quintiles at three-quarters and a quarter of their respective populations [19]. Generally, wealth status has been found to have an influence on contraceptive use in that those who are wealthier have high chances of using contraceptive.

Over the last four decades, Kenya has made good progress in increasing the utilization of contraception among married women. In 1978, the prevalence of contraceptive use among married women in Kenya was 7 percent and this increased over the years to 46 percent in 2009 [21]. Despite these improvements, there are huge regional variations in the prevalence of contraceptive use. While the contraceptive prevalence in some of the regions is comparable to that of developed countries, in other regions the prevalence is quite low. These variations have an impact on efforts to increase the overall contraceptive prevalence in the country [19]. What are the causes of the observed regional variations? How can these variations be bridged? This research will attempt to look at the determinants of contraceptive use among women in Northern Kenya based on the KDHS 2008/2009 Dataset against selected factors.

2.1 Contraceptive Prevalence in Northern Kenya

Adult mortality indicators show that females in Garissa County live for nine years longer than males. This is according to the Kenya National Bureau of Statistics report [21]. The study presented grim statistics which showed North Eastern is the region with the highest prevalence of early marriages with about one in every five women aged between 25 and 49 years getting married at age 15 years. The report further showed the region to have the least acceptance and use of contraceptives with 96 percent of women not using family planning in controlling population growth and thereby frustrating the realization of the Millennium Development Goals and the Vision 2030. The total fertility in the county has greatly decreased from 7.0 children in 2003 to 5.9 children per woman as per the 2008-09 Kenya Demographic Household Survey (KDHS) which is higher than the country‘s 4.6. Only four per cent of married women use modern methods of family planning that is going to have a minimal impact on overall population growth rates in the county. Injectable are the most popular type of family planning method used. 2% of married women use Injectable while 1% uses implants, which is the second most popular method [19].

Counties in northern Kenya are experiencing the highest population growth rates compared to most parts of the country, a new report shows. So high is the growth rate that in one of the counties, Mandera, the increase is 29 times more than the least growing, Nyeri [22]. Whereas the population growth rate in Mandera is 14.1 per cent that of Nyeri is 0.4 per cent, a near plateau. This, means for every 14 children born in Mandera, there is only one – or hardly any - born in Nyeri. According to the Kenya National Bureau of Statistics [21], other than Mandera, neighboring Wajir records the second highest rate of 7.3 per cent. Ranked third is Turkana County at 6.4 per cent followed by Kajiado, whose population is rising at the rate of 5.3 per cent. Another northern Kenya county, Marsabit, emerges fifth, with a population growth rate of five per cent [6], [22].

2.2 Women’s Education

There is an association between childbearing and education. Forty percent of women with no education will have had a child by the age of 20. For those with primary schooling, the

figure drops to 30 percent and for those with a secondary education; it drops to 8 percent, that is, one-fifth of their uneducated peers. Women with no education have the highest fertility rate at 5.8 births per woman while those with secondary education or higher have the lowest at 3.5 births per woman [11].

Education plays an important role in the acceptance and use of contraception. It is often assumed that better educated couples, being more exposed to family planning information are more likely to practice contraception than others. Moreover better educated women tend to have fewer children and try to give better education to their children than do their lesser educated counterparts [24]. Education has a positive effect on the use of contraception. Increase in the level of education was associated with greater use of contraception methods. Better-educated women were more likely to practice contraception and to use modern methods [34]. Data from the countries where the Demographic and Health Surveys have been conducted demonstrate the positive relationship between education and the use of family planning [31]. Rutenberg analyzed the world fertility survey that was collected from 25 countries and found a positive relationship between women's education and the contraceptive method practices, and that education was associated with increased awareness, acceptability and use of contraception [32.] A study in Turkey found that educational level of women did not seem to affect the contraceptive preference of women [38].

Many studies have documented the relationship of female education to the decline in fertility; it was recognized that education is the primary factor contributing to rise in contraceptive use. For example Caldwell [9] explained that education of women is seen as vehicle by which people learn about the family, which may lead to demand for fewer children. Consequently, it will contribute to the use of contraceptive to prevent or to space childbirth. Weinberger [41] also explained that education might affect fertility control including the following; education facilitates the acquisition of information about family planning; it increases husband-wife communication and increases couple income potential and thus making a wide range of contraceptive methods affordable. Furthermore, Cochrane[11] explained that women's education is linked to rise in the age at

marriage and reduce the probability of ever marrying. Education is also positively related to more favourable attitudes towards birth control and greater knowledge of contraception.

Bertrand [4] explained that education might affect the distribution of authority within households, whereby women may increase their authority with husbands, with effect on fertility preference and use of family planning. Similarly, Martin and Juarez [26] emphasized that education could increase knowledge of fertility, increase socioeconomic status, and change attitudes. Moreover, Bertrand [2] found that the differential of contraceptive practice rate is greater between women who have no education and those who have attended primary school. Substantial differences are also found in the prevalence of contraceptive use between women with some primary education and those with some secondary school or higher education.

In Kenya, education has been shown to be an important determinant of contraceptive use. Central and Nairobi regions, which have the highest contraceptive prevalence, have the lowest proportion of females with no education at about 1 in every 10 compared to Coast and North Eastern regions which have the lowest contraceptive prevalence but the highest proportion of females with no education at one-third and over two-thirds of the females respectively [20].

2.3 Occupation

The work status of women is often considered to be an important determinant of contraceptive use. Employment, especially where a woman has to work outside the home is viewed as an index of commitment to and involvement in non-familial roles. It has also been observed that female employment outside home often leads to a desire for small families and thereby increasing the acceptance rate of contraceptives [16]. A study in Indonesia by Soeradji [33] found that proportion of women who were working had a higher acceptance rate of contraceptive use. Another study done in Indonesia focused only on the woman's status and family planning and found that working women had a slightly higher level of contraceptive use than non-working women. However, the difference was

not significant, although women did perceive benefits from practicing family planning [15]. Dharmalingam and Morgan [13] conducted another study in India which revealed that women's work give women autonomy that led to limit and space birth and contraceptive use.

The probabilities of contraceptive use were higher among self employed women and women who were employees than those women who were not employed [34]. The type of occupation a woman has was also found to be an important determinant of contraceptive use. Lower fertility was found to be a characteristic of women in professional and technical occupation and women with higher opportunities.

A large number of studies have looked at women's work activity and their contraceptive and fertility behavior in developing countries [36,23,28,35]. In many cases, these studies do not find evidence of significant relationships between work and fertility, and there is conflicting evidence with regard to the relationship between employment and contraceptive behavior.' However, as Standing[35] has noted, many studies consider rural women as well as urban women, and fail to distinguish between formal-sector and informal-sector employment.

2.4 Religion

Several studies have demonstrated that religion have a significant role in the use of contraceptive methods. A study by Molyneaux [25] in Indonesia showed that religion played a major role in method use and choice. Islam was strongly correlated with the probability of choosing Injectable type of contraceptive compared to other modern methods. Robey [31] has described the success of Indonesia family planning program, with a rapid decline of TFR. One important factor was religion and the success was attributed to the fact that Islamic leaders were consulted before program implementation.

The relationship between religion and contraceptive use was observed in Kinshasa, Democratic Republic of Congo by Shapiro [34] .All Non-Catholic religious groups had slightly higher rates of contraceptive prevalence compared with Catholics. Women who

indicated no religious membership reported a definitely lower likelihood of practicing contraception.

On the other hand, the effect of religion on contraceptive use was also observed in a study in Greater Freetown, Sierra Leone, by Amin [1]. They found higher contraceptive prevalence rate among women affiliated with Catholics or another Christian religion than among those affiliated with Islam (28 percent, 24 percent and 13 percent respectively). The lower use of contraceptives among Islam women was positively associated with the desire for more children.

One important observation from research is that involving religious leaders in policy development has improved acceptance and understanding of family planning programs. A study in Bangladesh indicated the association between the practice of contraception and religion operates at the community level, but not at the individual level. A religious woman is not less likely to practice, but a woman living in a religious community is [29].

2.5 Exposure to family planning information from mass media

The study by Das [12] shows that about 45 percent of people practicing family planning were exposed to media. The results also suggest that having a radio set is potentially associated with practice of family planning methods. Oni and McCarthy [27] in their study in Ilorin, Nigeria, noted that the mass media such as radio, television and newspaper were the greatest single role in providing knowledge on family planning to women and increasing current use of contraception. Radio and television are two important mass media for disseminating family planning information in Bangladesh [18] .However, accessibility and exposure to family planning information through radio and television is still limited. The similar finding was found by Jato that women in Pakistan, India and Bangladesh who watched television regularly and exposed to explicit family planning messages use contraception [17]. They also conducted bivariate analysis to study the association between social and demographic characteristics, family planning communications campaigns and contraceptive behavior. They found that the more types of media those women were exposed, the more likely they practice contraception.

2.6 Research Problem

The latest data on the growth rates appears to confirm data from the National Coordinating Agency for Population and Development that shows married women in the arid and semi-arid north are the most active in child bearing, beating all other regions. During their child bearing age of between 15 and 49 years, the women give birth to twice the number of children by their counterparts in Nairobi [19]. On average, a northern Kenya woman would have six children during her reproductive period, compared to three for those in Nairobi. According to the data obtained from the Kenya Demographic and Health Survey [19] , overall, the proportion of married women who want no more children is highest in Eastern and Central regions and lowest in northern region. "Women in North Eastern Province and, to a lesser extent, those in Coast province, are far more pro-natalist than women in other provinces," says the 2008/9 KDHS report. The report found out that between 86 per cent and 96 per cent of married women in nearly all parts of Kenya want to stop child-bearing after the sixth child except North Eastern, where only 10 per cent of women want to stop after six births. It is factors associated with the low contraceptive use in Northern Kenya that the study intends to investigate.

2.7 Research Question

What are the individual factors influencing Contraceptive use among women aged 15-49 years in North Eastern Kenya?

2.8 Aim of the study

To determine the factors related to Contraceptive use among women aged 15-49 years in North Eastern Kenya.

2.9 Specific Objectives

The study will be guided by the following specific objectives:

1. To determine the methods of contraceptives available to women and their use in North Eastern Kenya
2. To determine the factors related to Contraceptive use by women of reproductive age in North Eastern Kenya

CHAPTER THREE: METHODOLOGY

3.1 Demographic characteristics of the study area

The North Eastern Province (NEP) is one of the eight provinces into which Kenya is divided. It occupies the eastern and north eastern parts of Kenya. The province borders Eastern province to the west, Coast province to the south, the Republic of Somalia to the east and Ethiopia to the North.

The province covers a land area of 128,124 square kilometers and with a very low density of population of 8 persons per square kilometer. The province is expansive and comprises 22 percent of Kenya's land mass but only 3 percent of the population. The province is divided into four districts namely Garissa, Mandera Wajir and Ijara. The latest Population and Housing Census conducted in 2009 recorded a population of 962,143 people in the whole of NEP. The population is distributed as follows; Garissa 392, 510, Mandera 250,372 and Wajir 319,261. Out of the total population of 962,143, males were 53 percent of the total population while women made up the remaining 47 percent. As can be noticed, males outnumber females in the entire province. Another peculiar demographic characteristic of NEP is that 48 percent of the population was below 15 years. This was the highest proportion for this age cohort in Kenya and NEP was closely followed by Western Province. Life Expectancy in the province is 52.4 which are lower than the national average of 54.7 [19].

The predominant religion in the area is Muslim. The economy of the province is predominantly dependent on nomadic pastoralism. The level of access to even basic social services such as education, health, water and sanitation is low with the consequence that poverty is deep and pervasive. Data from the Basic Report on Well-being in Kenya based on KNBS [20]; NEP posts the highest levels of rural hard core poverty at the adult-equivalent, household and individual level. The same report ranks 67 rural districts according to the level of food poverty. Garissa ranks 26th with a poverty index of 44 percent, Wajir 62nd with an index of 73 percent and Mandera 66th with an index of 84 percent.

3.2 Study Population

The study population was selected from all the women residents of North Eastern Kenya using the KDHS Data set 2008.

3.3 Study Design

This was a secondary data analysis and the study design was a cross sectional survey carried out in 2008/2009 using a population based representative sample.

3.4 Inclusion and Exclusion Criteria

A woman was eligible if she was resident and 15 years or more but less or equal to 49 years of age. This is reproductive age group of women.

3.5 Data Source

Data for this secondary data analysis was extracted from the KDHS 2008/2009 database which included information on all individuals, education level, use of any family planning method, household assets, employment status, education, religion, age, and all other variables whose effect will be investigated in this study.

3.6 Kenya Demographic and Heath Survey 2008/2009(KDHS)

The 2008-09 Kenya Demographic and Health Survey (KDHS) is a population and health survey that Kenya conducts every five years. It was designed to provide data to monitor the population and health situation in Kenya. From the current survey, information was collected on fertility levels; marriage; sexual activity; fertility preferences; awareness and use of family planning methods; breastfeeding practices; nutritional status of women and young children; childhood and maternal mortality; maternal and child health; and awareness and behavior regarding HIV/AIDS and other sexually transmitted infections.

One of the specific objectives of the 2008-09 KDHS was to measure changes in fertility and contraceptive prevalence use and study the factors that affect these changes, such as marriage patterns, desire for children, and availability of contraception, breastfeeding

habits, and other important social and economic factors. This is the objective that the analysis intends to focus on for North Eastern Kenya.

The 2008-09 KDHS information provides data to assist policymakers and programme implementers as they monitor and evaluate existing programmes and design new strategies for demographic, social, and health policies in Kenya. As in 2003, the 2008-09 KDHS survey was designed to cover the entire country, including the arid and semi-arid districts, and especially those areas in the northern part of the country that were not covered in the earlier KDHS surveys. The survey collected information on demographic and health issues from a sample of women at the reproductive age of 15-49 and from a sample of men age 15-54 years in a one-in-two subsample of households.

3.7 Sampling Procedure

The survey was household-based, and therefore the sample was drawn from the population residing in households in the country. A representative sample of 10,000 households was drawn for the 2008-09 KDHS. Compared with the other provinces, fewer households and clusters were surveyed in North Eastern province because of its sparse population. As a result of these differing sample proportions, the KDHS sample is not self-weighting at the national level; consequently, all tables except those concerning response rates are based on weighted data.

The KNBS maintains master sampling frames for household-based surveys. The current one is the fourth National Sample Survey and Evaluation Programme (NASSEP IV), which was developed on the platform of a two-stage sample design. The 2008-09 KDHS adopted the same design, and the first stage involved selecting data collection points ('clusters') from the national master sample frame. A total of 400 clusters 133 urban and 267 rural-were selected from the master frame. The second stage of selection involved the systematic sampling of households from an updated list of households. A number of clusters were updated for various surveys to provide a more accurate selection of households. Included were some of the 2008-09 KDHS clusters that were updated prior to selection of households for the data collection. All women age 15-49 years who were

either usual residents or visitors present in sampled households on the night before the survey were eligible to be interviewed in the survey.

3.8 Description of Outcome and Explanatory Variables

Explanatory Variables:

The effect of the following explanatory variables on contraceptive use was investigated.

Educational levels were categorized into None, Primary (1-7), Secondary (8-12), Higher (over 12 years).

Wealth status was measured using an index, based on ownership of assets, water and sanitation facilities, power source and housing quality. The household characteristics and assets were included in the Principal component analysis model (PCA). Based on PCA, SES of households was assigned to the residents of those households, and the resulting households were divided into quintiles (i.e. poorest, poorer, middle, richer, and richest) that represent the proxies for SES.

Employment status: This referred to whether an individual was formally employed or unemployed. The employment status assigned to an individual was the observation during 2008 when data was collected.

Exposure to family planning information from mass media: Refers to respondents whether they had heard or seen a message about family planning in the last six months from mass media: radio, TV, and newspaper

Residence

This referred to whether a woman was a resident in the rural area or in urban

Religion

This was divided into protestant, Muslim or no religion

Outcome Variable:

Contraceptive Use: This was measured by asking the women whether they had used any form of contraceptives in the last six months. It was categorized into Yes/No. This was therefore a binary variable.

3.9 Data Cleaning and Management

The core "entity" in this model is the individual; each is computer-assigned a unique identity number when first encountered in the field. This provides a link between the "Individuals" table and the information that describes them. Cleaning and statistical analysis was done using STATA 12. Individuals' dataset contained all the variables concerning an individual woman like id, Sex, Education, Religion, Marital status, the period or last date on which this individual was still under surveillance and other variables. The second dataset contained household assets variables. Socio-economic index was constructed from the assets dataset. Cleaning involved the checking of quality of the data in terms of missing values, duplicate records, internal consistencies, and recording, renaming and generating new variables.

3.9.1 Sample for analysis

A Woman was eligible if she was resident and 15 years or older but less or equal to 49 years. A total of 608 women in 104 households were included in the analysis. A total of 18 women were using any method of contraception while 590 were not.

3.9.2 Data Analysis

3.9.2.1 Descriptive statistics

The data for analysis was exported to STATA version 12 (STATA Corporation, Texas, and USA). Descriptive statistics were used to indicate number and percentage of women in the various categories of the explanatory variables.

3.9.2.2 Univariate and Multivariate Logistic Regression Model

To assess the factors related to contraceptive use among the women, the covariates were put in the Logistic Regression Model one by one to assess their individual effect on Contraceptive use at 5% significant level. A Multivariate Logistic Regression analysis was performed to assess the possible association between the covariates and contraceptive use. Adjusted models included covariates found to be significant at $P<0.05$ in univariate analyses. This multivariate model controlled for potential confounders.

3.9.5 Ethical Approval

Ethical approval was obtained from the Human Research Ethics Committee of University of Nairobi and Kenyatta Hospital. Permission for the use of the dataset was given by University of Nairobi (UNITID) and by Measure Evaluation, University of Carolina at Chapel Hill. A copy of the findings of this report will be presented to UNITID in accordance with Institutional Review Board guidelines for conducting health research.

3.9.6 Limitation of the study

The study was based on the 2008/09 Kenya Demographic and Health Survey (KDHS). In fact, the most updated data-base the 2013 KDHS data set is not yet available. Another limitation is that the variables and information available in the KDHS are also limited. Therefore, this study has focused upon only some of the factors influencing the contraceptive use in North Eastern Kenya, although there may be other important factors influencing the use and non-use of contraception. Estimates derived from a sample survey are affected by two types of errors: 1) non-sampling errors and 2) sampling errors. Non-sampling errors are the results of mistakes made in implementing data collection and data processing. Although numerous efforts were made during the implementation of the 2008-09 Kenya Demographic and Health Survey to minimize this type of error, non-sampling errors are impossible to avoid and difficult to evaluate statistically.

CHAPTER FOUR: RESULTS

This chapter presents the results of the analysis of this study. Analysis was done for the 2008/2009 KDHS dataset. The analyses were in four parts. The first part reported the baseline characteristics of the women in the various categories of the selected variables. The second part involved the Use of Print media and Audio-Visuals by women in Northern Kenya to access family planning messages. The third part analyzed Family Planning Methods currently used by women and preferred future method and source of contraceptives for women in North Eastern Kenya. The fourth part of the analysis focused on the reasons for non contraceptive use by women in the county. The fifth part investigated the factors associated with contraceptive use by women using Logistic regression model taking into account potential confounders.

4.0 Socio-Demographic Characteristics

The socio-demographic characteristics of the women in the study are shown in table 1. A total of 608 women were included in the study. There were 460 (75.66%) in rural compared to 148 (24.34%) in urban. More than three quarters of the women [465(76.48%)] had no education while only about 15% had primary level of education. About 70% of the women were in the age group 15-34 years of age. The religion of women in this county was predominantly Muslim, accounting for over 97% of the sample with Somali being the dominant tribe. The literacy levels of women were also low with over 77% not able to read at all. Most of the women came from poor households with over 66% in the lowest wealth quintile.

Table 1 Background characteristics of women included in the Contraceptive use analysis –KDHS 2008(Age: 15 years or older but less or equal to 49 years; n = 608)

Variables	Frequency (n)	Percentage (%)
Residence		
Rural	460	75.66
Urban	148	24.34
Education		
None	465	76.48
Primary	88	14.47
Secondary	43	7.07
Higher	12	1.98
Currently Working		
NO	500	82.24
YES	108	17.76
Age Category		
15-19	140	23.03
20-24	113	18.59
25-29	107	17.60
30-34	74	12.17
35-39	81	13.32
40-44	48	7.89
45-49	45	7.40
Religion		
Protestant/Christian	11	1.81
Muslim	593	97.53
No religion	4	0.66
Ethnicity		
Embu	1	0.16
Kamba	2	0.33
Kikuyu	5	0.82
Luhya	1	0.16

Luo	2	0.33
Somali	595	97.86
Other	2	0.33
Literacy		
Cannot read at all	469	77.14
Able to read only parts of a sentence	31	5.10
Able to read whole sentence	106	17.43
Blind/Visually impaired	2	0.33
Wealth Index		
Poorest	405	66.61
Poorer	36	5.92
Middle	40	6.58
Richer	61	10.03
Richest	66	10.86

Table 2: Access of Print media and Audio-Visuals by women in Northern Kenya (n = 608)

Variables	**Frequency (n)**	**Percentage (%)**
Frequency of reading newspaper		
Not at all	539	88.65
Less than once a week	21	3.45
At least once a week	28	4.61
Almost everyday	20	3.29
Frequency of listening to radio		
Not at all	393	64.64
Less than once a week	50	8.22
At least once a week	64	10.53
Almost everyday	101	16.61
Frequency of watching television		
Not at all	528	86.84
Less than once a week	15	2.47

At least once a week	15	2.47
Almost everyday	50	8.22
Number and percentage of women who obtained information on Family planning through radio, television and newspapers.(Knowledge and use of family planning methods)		
Heard family planning on radio last month		
No	542	89.14
Yes	66	10.86
Heard family planning on television last month		
No	582	95.72
Yes	26	4.28
Heard family planning on newspaper last month		
No	587	96.55
Yes	21	3.45

4.1 Access to information on family planning

Information access is essential for increasing people's knowledge and awareness of what is taking place around them, which may eventually affect their perceptions and behaviour. It is important to know the persons who are more or less likely to be reached by the media for purposes of planning programmes intended to spread information about health and family planning. In the survey, exposure to the media was assessed by asking how often a respondent reads a newspaper, watches television, or listens to a radio. Table 2 shows that a majority of the women 539 (88.65%) did not read newspaper at all while only about 28 (4.61%) read newspaper at least once a week. The frequency of listening to radio was also low with 393 (64.64%) not able to listen to radio at all. Only 15(2.47%) were able to listen to the radio at least once a week. Women in North Eastern Kenya had lower access to televisions with 528(86.84%) not able to watch television at all.

The table also indicates that access to information about family planning through the radio, television and newspaper was equally low. In the last month prior to the survey, 542(89.14%) of the women did not obtain information on family planning through the radio. During the same period 95.72% and 96.55% did not obtain information on family planning on television and newspaper respectively.

Table 3: Family Planning Methods currently used by women in North Eastern Kenya (n=608)

Method	**Number of women who have used method**	**% of women who have used method**
No method	594	97.7
Pill	1	0.16
Injections	9	1.48
Norplant	3	0.49
Lactation Amenorrhea	1	0.16
TOTAL	608	100

4.2 Methods of family planning currently used

Table 3 shows the methods of family planning currently used by the women in North Eastern Kenya. It is evident that over 97% of the women use no method of family planning. Injections are used by 9 (1.48%) of the women while Norplant is used by 3 (0.49%) of the women. Only 1(0.16%) of the women use the Pill and Lactation Amenorrhea. Development of a profile regarding knowledge of family planning methods was one of the major objectives of the survey, because knowledge of methods is a prerequisite for making a decision to initiate contraceptive use. Information on knowledge of contraception was collected during the survey by asking women and men to name ways or methods by which a couple could delay or avoid pregnancy. If the respondent failed to mention a particular method spontaneously, the interviewer described the method and asked if the respondent recognized it.

Table 4: Last source for current users of contraceptives

Last Source for current users of contraceptives		
	Frequency	**Percentage**
Government hospital	8	61.54
Government dispensary	1	7.69
Mission church hospital	1	7.69
Health centre	1	7.69
Private hospital	1	7.69
Pharmacy	1	7.69
Total	13	100

4.3 Source of Contraception

Information on where women obtain their contraceptives is useful for family planning programme managers and implementers for logistic planning. In the 2008-09 KDHS, women who reported using a modern contraceptive method at the time of the survey were asked where they obtained the method the last time they acquired it. Because some women may not know in which exact category their source falls (e.g., government hospital, private health centre, etc.), interviewers were instructed to note the full name of the source or facility. Table 4 shows the percent distribution of users of modern contraceptive methods by the most recent source of method. It indicates that public (government) facilities provide contraceptives to 61.54 while other sources took 7.69% each as indicated in the table above. The most common single source of contraceptives in Kenya is government hospitals, which supply more than half of all users of modern methods.

Table 5: Preferred future method of Contraceptive

Preferred future method of contraceptive		
	Number	**Percentage**
Pill	11	42.31
IUD	1	3.85
Injection	12	46.15
Norplant	1	3.85
Don't Know	1	3.85

4.4 Preferred Future Method

An important indicator of the changing demand for family planning is the extent to which non-users of contraception plan to use family planning in the future. In the KDHS, currently married women age 15-49 who were not using a contraceptive method were asked about their intention to use family planning in the future.

Table 5 presents data on the preferred method of contraception for future use for currently married women who are not using but say they intend to use in the future. The largest percentage of prospective users reported injectables as their preferred method (46.15 percent), with 42.31 percent citing pills, and 3.85 percent favouring IUD and Norplant each.

Table 6: Main reason for not using a method of contraception

	Frequency	Percentage
Not married	28	5.31
Infrequent sex	1	0.19
Menopausal, hyster	2	0.38
Subfecund, infecund	49	9.30
Wants more children	136	25.81
Respondent opposed	58	11.01
Husband opposed	14	2.66
Religion prohibit	199	37.76
Knows no method	16	3.04
Knows no source	1	0.19
Health concerns	6	1.14
Fear side effects	11	2.09
Lack of access	2	0.38
Other	2	0.38
Don't know	2	0.38
Total	527	100

4.5 Reasons for non Use

The reasons why women are not using any family planning method are of great interest to programme managers. Table 6 presents the distribution of currently married non-users who do not intend to use a contraceptive method in the future by the main reason why they do not intend to use. The table shows the main reasons given by women in North Eastern Kenya for not using contraceptives. As indicated in the table, the main reason was religion accounting for over 37% of the women. This was followed by responds mentioning that they wanted more children (25.81%), respondent opposed to family planning (11.01%), sub fecund/fecund (9.3%) and respondent not married (5.31%). The

data show that religion was the most commonly cited reasons for not intending to use family planning in the future.

4.6 Univariate Analysis

In a Univariate Logistic regression model shown in table 7 below, rural women were 89% less likely to use contraceptives compared to their urban counterparts [crude OR = 0.11,P < 0.000, 95% CI (0.04,0.33)]. Muslims were 98.98% less likely to use contraceptives compared to protestants [crude OR = 0.02, P < 0.000, 95% CI (0.004, 0.595)]. Women with primary, secondary and higher education were 2.72 times, 4.28 times and 19.04 times more likely to use contraceptives respectively compared to those with no education. The trend was similar in the case of socio economic status where the poorer, middle, richer and richest were 3.83 times, 10.86 times, 6.93 times and 18.48 times more likely to use contraceptives respectively compared to the poorest category. Respondents who were currently working were 3.2 times more likely to use contraceptives compared with those that were not working [crude OR = 3.2, P < 0.019, 95% CI (1.21, 8.48)].

Table 7: Univariate Logistic regression model for the analysis of determinants of Contraceptive use among women in North Eastern Province of Kenya (Age: 15 years or older but less or equal to 49 years; n = 608)

Variable	**Odds Ratio(OR)**	**95%CI**	**P-value**
Type of place of residence			
Urban (Reference)	1		
Rural*	0.11*	(0.04, 0.33)	0.000
Religion			
Protestant/Other Christian(Reference)	1		
Muslim*	0.02*	(0.004, 0.595)	0.000
No religion	0.83	(0.408, 16.99)	0.906

Education			
None (Reference)	1		
Primary	2.72	(0.80, 9.24)	0.109
Secondary*	4.28*	(1.09, 16.79)	0.037
Higher*	19.04*	(4.33, 83.80)	0.000
Socio-economic status			
Poorest (Reference)	1		
Poorer	3.83	(0.39, 37.78)	0.250
Middle*	10.86*	(2.12, 55.75)	0.004
Richer*	6.93*	(1.37, 35.16)	0.019
Richest*	18.48*	(4.77, 71.66)	0.000
Respondent currently working	1		
No (Reference)	3.2*	(1.21, 8.48)	0.019
Yes*			
Heard Family Planning on radio	1		
No (Reference)	11.91*	(4.52,31.43)	0.000
Yes*			
Heard Family Planning on television	1		
No (Reference)	25.42*	(8.97,72.02)	0.000
Yes*			
Read Family Planning on newspaper	1		
No (Reference)	9.63*	(2.87,32.34)	0.000
Yes*			

*** Significant at 5% significance level**

Women who heard family planning on radio were 11.91 times [crude OR = 11.91, P = 0.000, 95% CI (4.52, 31.43)] more likely to use contraceptives compared to those who did not. Women who heard family planning on television were 25.42 times [crude OR = 25.42, P = 0.000, 95% CI (8.97, 72.02)] more likely to use contraceptives compared to those who did not. Women who read family planning on newspaper were 9.63 times [crude OR = 9.63, P = 0.000, 95% CI (2.87, 32.34)] more likely to use contraceptives compared to those who did not. The above Odds Ratios in all the categories were statistically significant.

4.7 Multivariate Analysis

Multivariate analysis of the determinants of contraceptive use allows a precise exploration of the relationship between the various covariates, while controlling for other variables. This is illustrated in table 8 below. In a multivariate Logistic regression model adjusted for all the covariates, the observed association between the various factors and contraceptive use was attenuated. The model is shown in table 8 below.

In this model, holding other variables constant, rural women were 73% less likely to use contraceptives compared to their urban counterparts [Adjusted OR = 0.27, P < 0.181, 95% CI (0.039, 1.84)]. This was not statistically significant. Holding other variables constant, women with primary and secondary education were 2% and 52% less likely to use contraceptives respectively, compared to those with no education. Again holding other factors constant, women with higher education were 3.8 times more likely to use contraceptives compared to those with no education. However, all these were not statistically significant. The trend was similar in the case of socio economic status where holding other variables constant, the poorer, middle and richer were 2.68 times, 3.82 times, and 1.45 more likely to use contraceptives respectively compared to the poorest category. The richest category was 75% less likely to use contraceptives compared to the poorest category, holding other variables constant. Again there was no statistical significance in this category. Holding other variables constant, respondents who were currently working were 28% less likely to use contraceptives compared with those that

were not working [Adjusted OR = 0.72, P < 0.691, 95% CI (0.146, 3.57)].This was not statistically significant.

Holding other factors constant, Muslims were 98.8% less likely to use contraceptives compared to protestants [Adjusted OR = 0.02, P < 0.003, 95% CI (0.002, 0.0267)]. This was statistically significant. Holding other factors constant, women who heard family planning on radio were 3.61 times [Adjusted OR = 3.61, P = 0.110, 95% CI (0.749, 17.43)] more likely to use contraceptives compared to those who did not. This was not statistically significant.

Table 8: Multivariate Logistic regression model for the analysis of determinants of Contraceptive use among women in North Eastern Province of Kenya (Age: 15 years or older but less or equal to 49 years; n = 608)

Variable	**Odds Ratio(OR)**	**95%CI**	**P-value**
Type of place of residence			
Urban (Reference)	1		
Rural	0.27	(0.039, 1.84)	0.181
Religion			
Protestant/Other Christian(Reference)	1		
Muslim*	0.02*	(0.002, 0.0267)	0.003
No religion	1.42	(0.4017, 121.34)	0.9877
Education			
None (Reference)	1		
Primary	0.979	(0.194, 4.956)	0.980
Secondary	0.479	(0.051, 4.544)	0.522
Higher	3.835	(0.223, 66.00)	0.354
Socio-economic status			
Poorest (Reference)	1		

Poorer	2.68	(0.2329, 30.95)	0.428
Middle	3.82	(0.440, 33.14)	0.224
Richer	1.45	(0.124, 16.82)	0.768
Richest	0.25	(0.012, 4.68)	0.350
Respondent currently working			
No (Reference)	1		
Yes	0.723	(0.146, 3.57)	0.691
Heard Family Planning on radio			
No (Reference)	1		
Yes	3.61	(0.749,17.45)	0.110
Heard Family Planning on television			
No (Reference)	1		
Yes*	10.65*	(1.23,91.84)	0.031
Heard Family Planning on newspaper			
No (Reference)	1		
Yes	0.468	(0.044,4.897)	0.526

*** Significant at 5% significance level**

Women who heard family planning on television were 10.65 times [Adjusted OR = 10.65, P = 0.031, 95% CI (1.23, 91.84)] more likely to use contraceptives compared to those who did not, holding other factors constant. This was statistically significant. Women who read family planning on newspaper were about 54% [Adjusted OR = 0.468, P = 0.526, 95% CI (0.044, 4.897)] less likely to use contraceptives compared to those who did not holding other factors constant. This was not statistically significant.

CHAPTER FIVE: DISCUSSION

5.0 Introduction

This is one of the few population based studies in North Eastern Kenya to investigate the relationship between various covariates and contraceptive use among women of reproductive age. The study also sought to find out the methods of contraceptives available to women and their use in North Eastern Kenya. The study illustrates that contraceptive use is very low in the community and that the only methods available are the Pill, Norplant and Injections. Of the methods available, injections appear to be popular with some women. Religion was cited as the main reason for non use of contraceptives. Religion was found to be the single most important factor associated with contraceptive use in the province. Watching television was also associated with contraceptive use.

5.1 Factors associated with Contraceptive Use in Women

The most preferred method of contraception in this community was injectables. A study by Molyneaux [25] in Indonesia showed that religion played a major role in method use and choice. Islam was strongly correlated with the probability of choosing Injectable type of contraceptive compared to other modern methods. It also revealed that women in North Eastern province of Kenya have the lowest uptake of contraceptives in the country. This is in agreement with other studies that reported low prevalence of contraceptive use by women. For example, according to the Kenya Bureau of Statistics and ICF Macro [20], the province presented grim statistics which showed North Eastern is the region with the least acceptance and use of contraceptives with 96 percent of women not using family planning in controlling population growth.

Education was found to be associated with contraceptive use in this community but the association disappeared when other factors were controlled for. According to Cochrane [11], women with no education have the highest fertility rate at 5.8 births per woman while those with secondary education or higher have the lowest at 3.5 births per woman. Studies carried out in other parts of the world also found a positive relationship between education and contraceptive use [2, 24, 26, 31, 32, 34, 38]. It has been postulated that education

facilitates the acquisition of information about family planning; it increases husband-wife communication and increases couple income potential, making a wide range of contraceptive methods affordable. Furthermore, Cochrane [11] explained that women's education is linked to rise in the age at marriage and reduce the probability of ever marrying. Education is also positively related to more favourable attitudes towards birth control and great knowledge of contraception. Similarly, Martin and Juarez [26] emphasized that education could increase knowledge of fertility, increase socioeconomic status, and change attitudes.

However, in North Eastern province of Kenya, there was no association between education and contraceptive use. This could be due to the fact that women in this community are generally illiterate. The data shows that over 76% of the women have no education. This means that there are no education differentials among women in this community that could bring about any significant effect.

The single most important factor which was found to be associated with contraceptive use was religion. This factor was both significant in the Univariate and Multivariate models. Muslims were about 98.98% less likely to use contraceptives. This is in agreement with other studies. Robey [31] has described the success of Indonesia family planning program, with a rapid decline of TFR. One important factor for the success was that Islamic leaders were consulted before program implementation. On the other hand, the effect of religion on contraceptive use was also observed in a study in Greater Freetown, Sierra Leone, by Amin [1]. They found higher contraceptive prevalence rate among women affiliated with Catholics or another Christian religion than among those affiliated with Islam (28 percent, 24 percent and 13 percent respectively). The lower use of contraceptives among Islam women was positively associated with the desire for more children. A study in Bangladesh indicated the association between the practice of contraception and religion operates at the community level, but not in the individual level, a religious woman is not less likely to practice, but a woman living in a religious community is [29]. All these studies agree with the findings of this study. It means that for

effective uptake of contraceptives, Islamic leaders must be consulted and the importance of family planning explained to them.

Another important factor that was found to be associated with contraceptive use is the mass media, particularly the watching of television. This was statistically significant in the unadjusted and the adjusted models. Women who watched family planning messages on television were more than 10 times more likely to use contraceptives compared to those who did not, holding other factors constant. The similar finding was found by Jato [17] that women in Pakistan, India and Bangladesh who watched television regularly and exposed to explicit family planning messages use contraception. He also found that the more types of media those women were exposed, the more likely they practice contraception.

Other factors investigated such as residence, socioeconomic status and whether respondent was currently working were only significant in the unadjusted model but the statistical significance disappeared in the adjusted model. This could possibly be explained by the fact that most women live in the rural areas and the community consists of pastoralists and so very few live in the towns long enough to interact with modern methods of family planning through available means. There are also no marked differences in socioeconomic status among the women since over 66% of the women fall under the lowest socioeconomic quintile. Other studies have shown that women's occupation is positively associated with contraceptive use. A study in Indonesia by Soeradji [33] found that proportion of women who were working had a higher acceptance rate of contraceptive use. Another study done in Indonesia focused only on the woman's status and family planning found that working women had a slightly higher level of contraceptive use than non-working women.

However, the difference was not significant, although women did perceive benefits from practicing family planning [15]. Dharmalingam and Morgan [13,] who conducted the study in India, revealed that women's work give women autonomy that led to limit and space birth and contraceptive use. However, there was no relationship between contraceptive

use and whether a woman was working or not. This could be partly explained by the fact that very few women could be classified as currently working at the time of the survey. The homogeneity of women in terms of working status could not therefore allow for any statistical significance to be detected.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

Religion and mass media particularly the use of television may be predictors of contraceptive use among women in North Eastern Kenya. In this region, women who were Muslims were less likely to use contraceptives compared to Protestants. In addition, women who watched family planning messages on television were more likely to use contraceptives compared to those who did not. The women in the North Eastern Kenya prefer the use of injection to other methods such as the pill as a method of family planning.

6.2 Recommendations

One major recommendation is that family planning programs in North Eastern Kenya should involve Muslim leaders in their planning and implementation in order to create a possible buy in by the women.

Secondly, injection as a method of family planning should be promoted as a method of family planning among the women in North Eastern Kenya.

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