INDIVIDUAL AND HOUSEHOLD LEVEL ASSOCIATES OF MODERN CONTRACEPTIVE USAGE AMONG MARRIED WOMEN IN WAJIR AND GARISSA COUNTIES IN KENYA

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DECLARATION

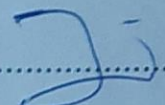This research paper is my original work and has not been presented elsewhere for a degree or any other award.

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This research paper was prepared under my supervision as a university supervisor

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This research paper is dedicated to my family for their tremendous support and encouragement throughout my studies, as well as to my mother Joyce Namakula Njakasi, who is no longer with us; we miss you.

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ABBREVIATIONS AND ACRONYMS

BMGIPRH The Bill and Melinda Gates Institute for Population and Reproductive Health

CPR Contraceptives Prevalence rate

FP Family Planning

ICRHK International Centre for Reproductive Health Kenya

KNBS Kenya National Bureau of Statistics

KDHS Kenya Demographic and Health Survey

LMIC Low- and Middle-Income Countries

MOH Ministry of Health

NCPD National Council for Population and Development

SDG Sustainable Development Goal

UNDESA United Nations Department of Economic and Social Affairs

WHO World Health Organization

WHA World Health Assembly

ABSTRACT

Kenya's birthrate is 3.4 children per woman, compared to 2.4 globally given the increasing expenditure in family planning programs and education among married women. High fertility rates can cause maternal mortality, anemia, third-trimester hemorrhage, premature membrane rupture, and puerperal endometritis. Despite improvements in contraceptive usage among married women, certain communities remain behind and have high fertility rates and unmet demand. In most nations, including Kenya, contraceptive usage has individual and population-level advantages. A fall in fertility boosts economic growth since there are fewer dependent children and more working women. This research evaluates contraceptive usage in Wajir and Garissa counties in Kenya. Kenya Demographic and Health Survey 2014 was used as the source of data. The binary logistic regression model was used to examine outcome and factor variables. Based on the findings, attaining primary education, being among those in the highest wealth quintile, ease of access to a health facility, husband's approval of Family Planning and women empowerment positively impacted modern contraceptive usage in the two counties The study recommends that men should be educated and involved in Family Planning activities, more targeted Family Planning interventions especially the poor and promotion of education in general with focus on population and family size.

CHAPTER ONE

INTRODUCTION

1.1 Background

Around 80 million people are added annually at the world population's current growth rate (1.13%) (Tripathi et al., 2019). According to the UN, "the population worldwide will increase from 7.4 billion in 2016 to 8.1 billion in 2025 and even more in 2050, with emerging nations having the highest growth, with more than half of that increase in Africa(UNDESA, 2019; UNDESA, Population Division, 2015).

The worldwide fertility rate is expected to fall from 3.2 births per woman in 1990 to 2.2 in 2050. In 2019, Sub-Saharan Africa (4.6), Oceania excluding Australia/New Zealand (3.4), North Africa and West Asia (2.9), and Central and South Asia (2.4) had above-average fertility (UNDESA, 2019).

A decline in fertility can boost economic growth because there are fewer dependent children and adolescents and more women can work (Canning & Schultz, 2012). The SDG 3 urges nations to give more children and youth health care, education, and jobs. Sub-Saharan Africa's high population expansion hinders this ambition.

In the 1970s and 1980s, family planning (FP) received significant international support, and as a result, the prevalence of contraceptives increased significantly, reducing fertility worldwide (Cleland et al., 2006; Mwaikambo et al., 2011). Additionally, it has been demonstrated that FP and contraception are crucial to ensuring the health, safety, and independence of women, as well as the growth and prosperity of the communities in which they live (World Health Organization, 2014).

In 2019, 41% of married women worldwide utilized contraception(UNDESA, Population Division, 2020). Access to contemporary FP among reproductive women (15–49) is a worldwide and LMIC concern (Guttmacher Institute et al., 2020).

It is widely acknowledged that modern family planning methods influence fertility reduction globally and improve women, children, and families' health, especially in developing nations (Darroch et al., 2008; World Bank, 2009). The Kenyan government has implemented a number of strategies and policies in collaboration with other parties involved in their delivery to boost the usage of modern contraceptives.

These interventions have raised the number of married women who use some kind of modern contraception from 53 percent in the year 2014 to 61 percent in 2018 with unmet need estimated at 11.5% in 2019 (FP2020, 2019). One in ten women still needs FP (ICRHK & BMGIPRH at The Johns Hopkins Bloomberg School of Public Health, 2018).

Kenya still has differences in how many people use contraception based on where they live and what county they live in, as shown by a number of national demographic and health surveys (Council of Governors, 2020; Wafula, 2015). Some of the reasons why women don't use modern contraceptives are lack of information, limited access to methods and options, high cost, fear of health consequences, cultural or religious opposition, and partner disapproval(Khan et al., 2008; Pav & Boadi, 2000).

1.2 Problem statement

Kenya has made progress in getting married women to use modern birth control, but in 2019, the fertility rate was still high at 3.4 births per woman, which is higher than the global average of 2.4 births per woman around the world (World Bank, 2019). By 2030, Kenya aims that every woman will have 2.6 children on average according to the NCPD (NCPD, 2012).

In comparison to other counties/regions within the country, Wajir and Garissa are among the counties with the highest fertility rates of 7.8 and 5.2 children per woman respectively; total births per woman for the north-eastern region is highest at 6.4 children per woman.(KNBS et al., 2015).

With increased fertility rates come issues such as reduced human capital investment, slowed economic growth, increased environmental threats, as well as increased health risks for mothers and children (World Bank, 2010).

It is widely accepted that modern family planning methods influence fertility reduction worldwide and have a significant impact on the well-being of women, children, and families, particularly in low-income nations. Boosting economic growth, empowering women and girls, and enhancing maternal health are all possible with the help of one of the most affordable public health strategies, FP (Stiegler & Susuman, 2016).

Through various interventions, the number of married women in Kenya who use contraception has gone up from 53% in 2014 to 61% in 2018 with an unmet need still estimated at 11.5% in 2019 (FP2020, 2019). However, CPR for Wajir, and Garissa is at 2% and 6% respectively, among the lowest in the country (KNBS et al., 2015)

This study, therefore, attempted to comprehend the individual and household level factors affecting modern contraceptive usage among married women in Wajir and Garissa counties as an avenue to reduce fertility while also focusing on rural-urban and county disparities. Additionally, since all respondents, including men and children of school age, were part of the survey, the study concentrated on married women.

By doing this, Kenya is specifically addressing indicator 3.7.1, which measures the percentage of women of childbearing age (15–49 years) who have their family planning needs met by modern methods which in turn supports target 3.7 under SDG 3, that aims to ensure healthy lives and promote well-being for all (UN, 2015; UNDESA, Population Division, 2020).

Studies by Jalang'o et al. (2017); Lunani et al. (2018); Ochako et al. (2016) focused on individual factors that affect FP use, such as a woman's age, her education, her religion, how much she heard about FP in the media, her wealth index, and her job. These studies examined the overall contraceptive uptake in Kenya for all women of childbearing age. This study focused on married

women since the data collected had all the respondents including school going children and men as well putting emphasis on the counties that have the highest fertility rates in Kenya.

Other studies have linked significant benefits to community-level factors related to modern contraceptive usage in nations like Mozambique and Nigeria (Dias & de Oliveira, 2015; Ejembi et al., 2015; Tripathi et al., 2019). According to the research conducted in Poland, women's unique traits had less of an impact on their contraceptive behavior than do the practices of friends and family (Colleran & Mace, 2015).

The study's originality will help policymakers make strategic decisions that will enhance CPRs in the target counties while addressing the high fertility rate issue. The study is needed so that ways can be found to get more people to use modern birth control and to establish and execute FP programs in these counties and across the country.

1.3 General Objective

This study examines the individual and household level factors that influence contraceptive usage among married women in Wajir and Garissa counties in Kenya.

Specific Objectives are;

i.   To examine demographic and socio-economic factors that influence married women in Wajir and Garissa counties in Kenya, to use modern contraceptives.

ii.   To draw policy implications based on the findings

1.4 Research Question

i.   Which demographic and socio-economic factors influence married women in Wajir and Garissa to use modern contraceptives?

1.5 Contribution of the study

This study examined individual and household level factors that could be used to develop and implement more targeted FP programs to increase the use of modern contraceptives in the aforementioned counties. This information will assist policymakers, planners, profit- and non-profit organizations, and healthcare professionals develop programs to improve modern contraception use across Kenya's counties. This study will explain how socio-economic and

demographic factors affect married women's usage of contemporary contraception in this region. Concerning the usage of FP and other health services, I think that results may also apply to other counties across the nation. Counties will be able to lower fertility rates and close the unmet need gap with the help of this information.

1.5 Organization of the Study

In the subsequent sections, chapter 2 addresses the literature on both theory and practice, chapter 3 includes the model specification, data sources, variable definitions and estimation tests that were carried out. Chapter 4 brings to light the descriptive statistics, regression analysis, findings and followed by the discussion. Lastly, chapter 5 forms the summary of the study, conclusions, policy implications and areas for further research.

CHAPTER TWO

LITERARURE REVIEW

2.1 Introduction

Numerous studies have been carried out in various nations to better understand how factors at the individual and household level influence modern contraceptive acceptance, particularly in developing countries. By looking at these theoretical and empirical studies, it will provide the basis for identifying the variables to be used for the analysis.

2.2. Theoretical review

2.2.1 Health Service Utilization Behavioral Model

The study's FP concept was based on Andersen's Behavioral Model (BM). Ronald M. Andersen, a U.S. professor and researcher, created the concept in 1968. The BM considers both individual and context-specific health care determinants (Babitsch et al., 2012). Individual attributes are examined individually, but contextual attributes are aggregated. Families, health systems, and communities are examples(Andersen, 2008; Babitsch et al., 2012; Da Silva et al., 2011).

The approach attempts to understand why and how people utilize health care, assess gaps in access, and propose policies to enhance equitable access (Andersen, 1995). This model is utilized in order to assess access measures and also to understand the environment that impacts the usage and accessibility of health care (Travers et al., 2020). Critical model hypotheses are added to health and consumer satisfaction outcomes. Thus, the BM provided a helpful framework for analyzing the factors which contribute to the usage of modern contraceptives along with other health services, plus it contains three components which may be utilized as predictors of usage (Andersen, 2008; Magaard et al., 2017).

According to Andersen & Davidson (2007) the three postulates are as follows: First, predisposing variables, related to sex and age as biological demands that provide the environment for increasing the possibility of using health services. Factors such as ethnicity, education, job, and social relationships in addition to health beliefs and understanding about health and healthcare are included. Contextual factors that influence people's propensity to use healthcare facilities include organizational and communal values, cultural norms, political perspectives, and the social and demographic makeup of communities.

Second, organizational factors include components such as the kind and source of care, the amount of time invested in the facility, and travel time to and from the center. At the community level, funding consists of the resources for health care, including the per capita income of the neighborhood, the distribution of health services and staff members, the relative costs of services and goods, the ways in which healthcare providers are compensated and healthcare expenditures. At this level, location, diversity, quantity, distribution and structure of health facilities and personnel are organizational factors. This also consists of a number of providers, office hours, the number of hospitals and doctors, supervision of quality management, in addition to public relations and training initiatives.

The need factors, or variables which deal with perceptions of a difference in an individual's overall health condition, come in third. Andersen & Davidson (2007) distinguish the actual needs for health care that respond and the perceived requirements for the services at the individual level. They also talk about how individuals view and experience their general well-being, functional status, disease signs and required assessments, which are expert assessments & measurements of a patient's health condition and demand for medical attention. They made a distinction between population health indices and environmental requirement factors at the contextual level. These are just a few of the examples of environmental needs which relate to the health of the environment. Water, air, and housing standards are only a few examples. The index of population health is a comprehensive measure of the health of a community.

Through the above model, this study highlights the determinants of contraceptive use as a health care service categorized into predisposing factors to use contraception, these are the individual and household characteristics that make an individual more likely to use contraceptives and they usually include demographic characteristics such as age, educational attainment, etc. Secondly, the use of contraceptives can be determined by enabling factors such ease of access to the health facility as pertaining to this study. Thirdly, under the need for services which represents actual and perceived needs of an individual to use contraceptives, factors such as the husband's desire to have more children, total number of children alive and medical conditions to mention but a few are part of this study.

2.3 Empirical Review

Numerous studies have examined modern contraceptive utilization at the individual level as follows:

According to Ajmal et al.(2018); Fagbamigbe et al.(2015); Satyavada & Adamchak, (2000); and Wasswa et al.(2021) educated women used modern contraceptives most often than those who were not educated. Women who are educated had access to information and resources on contraception, and education strengthens their bargaining power and decision-making ability. In the Northeastern region which encompasses Wajir and Garissa counties, married women had a low decision-making capacity (63.3%)(KNBS et al., 2015, p. 281). Women in high-education communities used modern contraception more often, according to Wasswa et al. (2021). This implies that formation of a community affects people's health and search activities, including health awareness and family planning access. This study evaluated education's impact on contemporary contraceptive usage in Wajir and Garissa counties.

Many other findings revealed that women who reported that the ease of access to healthcare facilities was not a problem in their specific communities were more inclined to seek out and utilize modern contraception than those who reported difficulties (Gurmu & Etana, 2014; Silumbwe et al., 2018; Wasswa et al., 2021). The proximity of healthcare facilities to individuals influenced their health-seeking behavior for healthcare services such as access to modern contraception in a community (Ettarh & Kyobutungi, 2012). Long commutes to healthcare facilities discouraged women from using family planning consistently, which led to abandonment and intermittent use (Silumbwe et al., 2018). Another study found that neither social media nor a community health center improved contraceptive use (Colleran & Mace, 2015). This study seeks to find out whether the ease of access to a health facility impacts usage of modern contraception in the counties of interest.

Modern contraception is more likely to be used in places with more married women in the workforce than in places where few women have jobs. In communities with more working married women, more women used modern contraception (Wasswa et al., 2021). Additionally, people who lived in areas with a lot of poverty were less inclined to using modern birth control than those living in areas with less poverty (Wasswa et al., 2021; Abate & Tareke, 2019). In Belarus and Kazakhstan, women in the lowest income quintiles rarely used contemporary contraception

communally and individually, even though neither was related to contraceptive usage (Janevic et al., 2012). The trip to the hospital may be long in economically impoverished communities with poor health services. It was discovered that in Ethiopia, women in higher-educated groups were more confident in their decision-making processes, which reflected in their choice of access to health services such as modern contraceptives, whereas in poorer communities, investment in women's empowerment and education was very low, resulting in low decision-making powers in areas such as health (Abate & Tareke, 2019). The study used this information to determine whether poverty contributed to the low CPR rates in the counties studied as most studies captured were focusing on countries as a whole.

Individual access to family planning messaging didn't affect married women's use of modern contraception, but communal exposure did (Wasswa et al., 2021). Married women in high-exposure environments used modern contraception more. In East and West Africa, only women's permission to use FP within communities was substantially connected to contraceptive usage. In Ghana and Tanzania, community family planning permission influenced contraceptive use more than a woman's partner's assent (Stephenson et al., 2007). It should be mentioned that one of the key elements influencing the usage of contemporary contraceptives is a person's knowledge about family planning. Individuals or couples can postpone or prevent childbirth if they know the methods, how to utilize them, and how to get resources. Furthermore, research by Mohammed et al. (2014) found a link between low family planning awareness and variables including spouse approval, apprehension over side effects, and a desire for more children. This study looked into whether this is also true for the counties of interest, and if so, then policy should be able to find better ways to improve FP information dissemination.

According to research in Ethiopia, Uganda, Tanzania, Zimbabwe, and Kenya, urban women utilized contraception more frequently than rural women (Alemayehu et al., 2010; Bigala et al., 2015; Towriss & Timaeus, 2018). Alemayehu et al. (2010) discovered that adolescent fertility is strongly predicted by women's education and place of residence, especially for those staying in Addis Ababa and other urban areas, which are associated with low fertility due to contraceptive use. Female fertility is lower in cities due to better decision-making skills, higher living standards, easier access to contraception, and greater autonomy than in rural areas.

Alemayehu et al. (2010) also noted that residency misclassification could occur, as the assumption that women currently living in cities were also living in cities at the time their children were born could be incorrect. In the same study, 14% and 25% of respondent mentioned that the place where they currently stayed differed from where they lived before in Ethiopia and Zimbabwe, respectively. This study sought to determine whether such differences exist and whether they are the primary causes of the low CPRs in the focus counties This study will also look at age, religion, husband consent, and the number of children who are alive in relation to the usage of modern contraception.

2.4 Section Summary

The research evaluated focused on individual-level characteristics of different nations, citing education, poverty level, exposure to FP messaging, ease of access to the health facility, female employment, and religion as drivers of modern contraceptive usage.

Studies by Ajmal et al.(2018); Fagbamigbe et al.(2015); Satyavada & Adamchak, (2000); Wasswa et al.(2021) indicated that women who are educated may use modern contraceptives more than the illiterate ones.

Research by Ettarh & Kyobutungi (2012) demonstrated that the existence of health facilities within reach had a crucial effect in individuals' health-seeking behavior and was similar to the findings from Gurmu & Etana, (2014) & Silumbwe et al., (2018) studies.

Janevic et al. (2012) reported that in Belarus and Kazakhstan, women in the lowest wealth quintiles used modern contraception less individually and communally level even though neither was related to contraceptive usage. The focus on each county will lead to a unique understanding and could then be applied across the country.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section discusses the model, data sources, variable definitions and measurements, data analysis, and econometric concerns.

3.2 Econometric Model Specification

There is a binary decision about a closed set of two choices: either to use a contraceptive or not to use it. Guided by this idea, the study used a binary logistic regression model to evaluate the social and demographic factors that impact the likelihood of contraceptive usage. Taking the binary logistic regression model in its natural form, we considered the observable variable $y_i = contraceptives\ uptake$, which takes on a value of $y_i = 1$ if under contraceptives and otherwise $y_i = 0$ if not under contraceptives. Let us also consider the existence of a latent variable y_i^* which informs the probability of using contraceptives. This invisible influence was modeled as follows:

$$y_i^* = x_i\alpha + \varepsilon_i \ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \ (3.1)$$

Where x_i contains a vector of the variables predicting y_i, α contains the vector of parameters to be predicted while ε_i is a random error term. Additionally, the following formalization was used to express the link between the unobserved variable and the response variable.

$$y_i = \begin{cases} 1\ if\ y_i^*\ is > 0 \\ 0\ if\ y_i^*\ is\ \leq 0 \end{cases} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. \ (3.2)$$

Guided by the information on Equation (3.1) and (3.2), we specified an estimable binary logistic regression model for contraceptive use as follows:

$$y_i^* = \alpha_0 + \alpha_1 AGE + \alpha_2 EDUC + \alpha_3 HWI + \alpha_4 WS + \alpha_5 AFB + \alpha_6 MEFPM + \alpha_7 AHF +$$
$$\alpha_8 NCB - RGN + \alpha_9\ WE + \alpha_{10} CR + \alpha_{11} RS + \alpha_{12} HAFP + \alpha_{13} HDC + \alpha_{14} NLC + \varepsilon_i \dots\dots\dots(3.3)$$

Where, y_i^* is the latent continuous variable, $\alpha_0\ \dots\ \alpha_{10}$ are the parameters of interest to be estimated. Age of the woman, education level, household wealth index, employment status, media exposure to FP messages, access to health facilities, number of children ever born, religion, women's empowerment, county of residence, place of residence, husbands' approval for family planning, husbands' desire to have more children, and the number of children alive are all represented by the variables AGE, EDUC, HWI, WS, AFB, MEFPM, AHF, NCB, RGN, WE, CR,

RS, HAFP, HDC, NLC in the equation. ε_i is the disturbance term that captures other variables omitted from the model.

3.3 Data sources

This study utilized data from 2014 KDHS as its data source from KNBS. Totaling 40,300 households, 31,079 women of reproductive age completed the interviews. From that, data for 268 married women from the counties of interest was considered for this study. This data set includes married women as well as the modern contraceptive information that was required to answer the study's research question.

3.4 Variable definition and measurement

This study's dependent variable was the use of contraception by married women of childbearing age (15 - 49 Years). Modern methods of birth control include male and female sterilization, the pill, intrauterine devices (IUDs), injectables, implants, male and female condoms, lactation amenorrhea, and emergency contraception ((KDHS et al., 2015).

The research developed a binary outcome based on the responses on whether a woman was using a modern contraceptive method, labeled 1 for yes and 0 for no.

The following are the independent variables for the study: Age, education level, household wealth index, total number of living children, exposure to mass media, employment status of women, the number of births a woman has had, hearing family planning messages through the media, visit to a health facility in the previous 12 months, and husband's desire to have more children. The variables have been described in Table 1 below.

Table 1 Operationalization and Measurement of the Study Variables

Variable	Measurement of description	Expected sign
Dependent Variable		
Modern contraceptive uptake	Yes = 1 No = 0	
Independent Variables		
Age	Fifteen_TwentyFour=1, otherwise=0 TwentyFive_ThirtyFour=1, otherwise=0 ThirtyFive -FortyNine=1, otherwise=0	Positive (+)/Negative (-)
Place of residence	Urban = 1 Rural = 0	Negative (-)/Positive (+)
Highest educational level	No_formal_education=1, otherwise=0 Primary=1, otherwise=0 Secondary=1, otherwise=0 Higher=1, otherwise=0	Negative (-)/Positive (+)
Religion	Protestants=1, otherwise=0 Muslims=1, otherwise=0	Positive (+)/Negative (-)
Household wealth index	Poorest =1, otherwise=0= Poorer =1, otherwise=0 Middle=1, otherwise=0 Richer=1, otherwise=0 Richest=1, otherwise=0	Negative (-)/Positive (+)
Number of children ever born	A continuous variable measured as the total number of children a woman has given birth to.	Negative (-)/Positive (+)
Number of children alive	A Continuous variable measured as the total number of children alive	Negative (-)/Positive (+)
Ease of access to a health facility	Yes = 1 No = 0	Positive (+)/Negative (-)
Husband's desire to have more children	Yes = 1 No = 0	Negative (-)/Positive (+)
Current working status of women	Not working – 0 Working - 1	Negative (-)/Positive (+)
women's empowerment	Yes = 1 No = 0	Negative (-)/Positive (+)
County	Wajir – Yes =1, Otherwise (Garissa)No = 0 Garissa – Yes =1, Otherwise (Wajir) No = 0	Positive (+)/Negative (-)
Media exposure to FP messages	Yes = 1 No = 0	Positive (+)/Negative (-)
Exposure to FP messages on phones	Yes = 1 No = 0	Positive (+)/Negative (-)
Husband's approval for Family Planning	Yes = 1 No = 0	Negative (-)/Positive (+)

Source: Author computations, 2022

3.5 Data Analysis and Econometric Issues

The analysis in this study was performed entirely with Stata using 5% significance level. To avoid biased results, relevant statistical tests were performed in terms of binary logistic regression models. The Variance Inflation Factor (VIF) results were used to check whether the study's variables exhibit multicollinearity and the Breusch-Pagan test was employed to determine whether the residuals have a constant variance over time.

3.6 Section Summary

This section gives a general overview of how the study was conducted and the data sources. The derivation and specification of the econometric model together with the relevant econometric questions are also explained in the section. This section discusses the statistical tools used for data analysis as well as the measurement and operationalization of the research variables.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.0 Introduction

This section talks about the descriptive statistics, their discussions, regression results, and their discussions, and the relevant diagnostic tests underlying the model robustness used in the study.

4.1 Descriptive Results

From Table 2 the study's descriptive results show that 6.7% of married women in Wajir and Garissa counties take modern contraception with a standard deviation of 25.1% indicating that usage of modern contraception among married women in Wajir and Garissa widely varies. Majority of the married women (50.4%) were between the ages of 25 to 34 followed by those in the age bracket of 35 to 49 years at 29.5% and the only 20.1% of the married women between 15 to 24 years. For the place of residence, 43.3% of these married women resided in an urban area while 56.7% were from rural areas. In addition, 82.8% had no formal education, 10% attained primary level education, 3.4% secondary and 3.7% higher education. A significant number of married women (95.5%) were Muslims, 4.5% were protestants. For the wealth index, 52.2%, 6.7%, 13.4%, 12.7% of married women were in the poorer, middle, richer and richest categories respectively. Furthermore, 17.5% of the married were working while the majority (82.5%) were not working. A vast number of these married women (75%) were empowered whereas the rest (25%) were not empowered. The maximum number of children ever born and those alive were 13 and 12 respectively.

The county representation was as follows; 63.4% of the married women were from Garissa and 36.6% were from Wajir. 5.6% of these married women had media exposure of FP messages while

1.5% had been exposed to FP messages on the phones and lastly about 28% of the married women

had their husband's approval for FP.

Table 2 Descriptive Statistics

Variable	Observations	Mean	S. D	Min	Max
Modern contraceptive Uptake	268	0.067	0.251	0	1
Fifteen_twentyfour (15-24 years)	268	0.201	0.402	0	1
TwentyFive_ThirtyFour (25-34 years)	268	0.504	0.500	0	1
ThirtyFive_FortyNine (35-49 years)	268	0.295	0.457	0	1
Place of residence (1 if Urban)	268	0.433	0.496	0	1
No_formal_education	268	0.828	0.378	0	1
Primary	268	0.100	0.302	0	1
Secondary	268	0.034	0.180	0	1
Higher	268	0.0373	0.189	0	1
Protestant Christian	268	0.045	0.207	0	1
Muslim	268	0.955	0.207	0	1
Poorest	268	0.601	0.192	0	1
Poorer	268	0.522	0.222	0	1
Middle	268	0.067	0.251	0	1
Richer	268	0.134	0.342	0	1
Richest	268	0.127	0.333	0	1
Number of children ever born	268	0.452	0.282	0	13
Number of living children	268	0.413	0.254	0	12
Access to Health Facility	268	0.496	0.500	0	1
Husband's desire for more children (1 if yes)	268	0.307	0.245	0	1
Working status (1 if yes)	268	0.175	0.381	0	1
Women empowerment (1 if yes)	268	0.75	0.434	0	1
Garissa	268	0.634	0.483	0	1
Wajir	268	0.366	0.483	0	1
Media exposure (1 if yes)	268	0.056	0.230	0	1
Exposure to FP messages on mobile Phones (1 if yes)	268	0.015	0.121	0	1
Husband 's approval of FP (1 if yes)	268	0.279	0.449	0	1

4.2 Diagnostic tests

4.2.1 Multicollinearity test

To assess the multicollinearity status of this dataset's variables, this study computed VIF. This is

important since the VIF shows if the predictor variable has a strong linear relationship with the

model's other regressors. Hair et al. (2019) suggest that if VIF is less than 10, then collinearity is

inconsequential and does not pose a problem. From Table 3, variables with VIF above 10 have not

been included in any further analysis.

Table 3 The VIF test

Variable	VIF	1/VIF
Number of children ever born	13.74	0.072778
Number of children alive	13.43	0.074451
No_formal_education	7.77	0.128624
Primary	5.26	0.190061
Wealth index	3.31	0.302159
Place of residence	2.92	0.342259
Garissa	2.44	0.410053
ThirtyFive-FortyNine (35-49)	2.29	0.436609
Secondary	2.19	0.456153
TwentyFive-ThirtyFour ((25-34)	2.18	0.458106
Wajir	2.16	0.464028
Muslim	1.99	0.503693
Media Exposure	1.66	0.601211
Working status	1.47	0.678938
Husband's approval for FP	1.34	0.74784
Exposure to FP messages	1.2	0.834529
Women empowerment	1.17	0.854735
Ease of access to a health facility	1.17	0.856063
Husband's desire to have more children	1.13	0.887015

Source: Author computations, 2022

4.2.2 Heteroskedasticity test

Under heteroscedasticity, residuals at each level of the explanatory variables display a systematic change in the range of measured values. Its existence renders the predicted coefficients inefficient and thus unreliable. The study used a Breusch–Pagan test for heteroskedasticity.

Results in Figure 1 reveal that heteroskedasticity was a serious problem in our data set and as such, we used robust standard errors in our regression.

Figure 1 The Breusch-Pagan Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of Modern_contraceptive_uptake

chi2(1)   =   279.79

Prob > chi2 = 0.0000
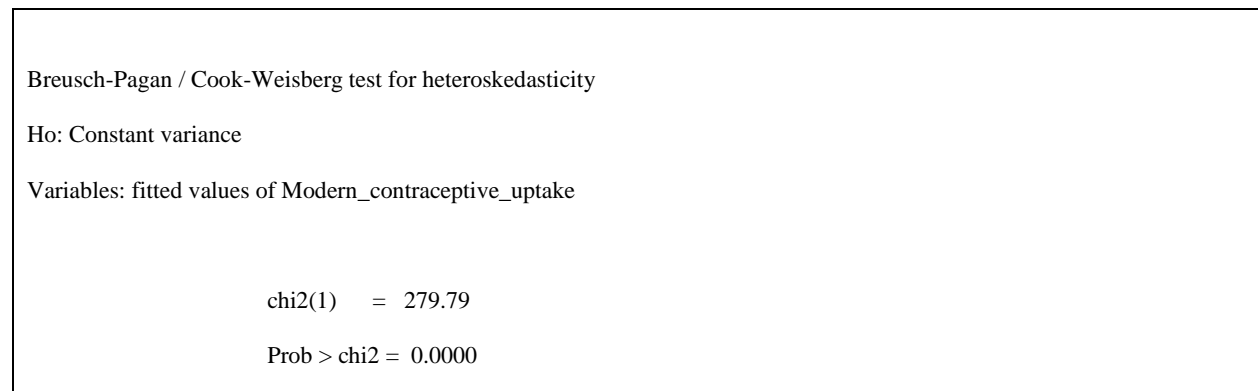
Source: Author computations, 2022

4.3 Regression analysis

The purpose of this study was to identify the factors that affect the usage of contraception among married Kenyan women residing in Wajir and Garissa counties. From our regression analysis in Table 4, the Pseudo r-squared = 0.5248 implies that about 52.48% of variations in the dependent variable (modern contraceptives uptake among Kenyan women who are married in Wajir and Garissa) are explained by the model's independent variables. The overall significance test indicates that at least one model coefficient is non-zero (Prob > chi2 = 0.000). The implication of this finding is that jointly, the study variables were jointly significant in explaining the response variable.

The coefficients and marginal effects of the independent variables from the logit model are shown in Table 4. In terms of marginal effects, obtaining a primary and secondary level education

increased the likelihood of using modern contraceptives by 15.2% and 7.9% respectively. These findings are in line with the studies of Ajmal et al.(2018); Fagbamigbe et al.(2015); Satyavada & Adamchak (2000) which found that as women's education increases, they become more knowledgeable about advanced methods of contraception and the significance of having a manageable family size.

The uptake of modern birth control among Kenyan married women in Wajir and Garissa was positively influenced by being in highest wealth quintile. Keeping other factors constant, modern contraceptive uptake for married women in the richest group increased by 14.9% in comparison to those in the poorest group. This finding is consistent with the hypothesis that households with a higher wealth index have knowledgeable women who understand the significance of family planning. Moreover, these women tend to be either formally or informally employed, which necessitates the usage of family planning methods so that they can devote more time to their jobs rather than to procreating and caring for children. The research of Alvergne et al. (2011), Fagbamigbe et al.(2015), and Shaweno & Kura (2020) also supports this conclusion.

At a significance level of 10%, the ease of access to health facilities had a positive impact on the use of modern birth control among married women in Wajir and Garissa by approximately 6.9%. This result is anticipated because, as more health facilities become available to women, the supply of modern contraceptives increases and usage increases as well. This, in turn, increases their accessibility, resulting in an increase in subscriptions. It has been revealed that the proximity of healthcare facilities to individuals influenced their health-seeking behaviour for healthcare services such as access to modern contraception in a community (Ettarh & Kyobutungi, 2012). However, long commutes to healthcare facilities discouraged women from using family planning consistently, which led to abandonment and intermittent use (Silumbwe et al., 2018).

Similarly, husband's approval of FP was found to increase the likelihood that Kenyan married women in Wajir and Garissa will use modern contraceptives by approximately 4.6%, when all other factors were held constant. This result supports the findings of Khan et al.(2008) in which a number of women stated that they did not use a particular method because their husbands opposed it.

In summary, the findings showed that attaining primary education and being part of the wealthiest quintile, attaining secondary education, ease of access to health facilities, women empowerment and husband's approval of FP positively influenced the use of modern contraception among married women in the counties of interest while the other variables didn't affect contraceptive usage.

Table 4 Logit model estimation results and the robust standard errors in parentheses

Variable	Logit Model	
	Coefficients	**Marginal effects**
Fifteen_TwentyFour	0.259 (1.437)	0.0086 (0.0477)
TwentyFive_ThirtyFour	0.205 (0.964)	0.0068 (0.0320)
ThirtyFive_fortyNine	-	-
Place of residence (1 if Urban)	0.131 (1.674)	0.004 (0 .056)
No_formal_ education	2.908 (1.766)	.0967 (0.057)
Primary	4.557*** (1.759)	.152*** (.0547)
Secondary	2.377* (1.587)	.079* (0.051)
Higher	-	-
Protestant Christian	1.863 (1.314)	.0619 (0 .042)
Muslim	-	-
Wealth Index Poorer Middle Richer Richest	1.766 (1.698) 2.607 (1.839) 1.770 (1.655) 3.581** (1.805)	.040 (0.047) .079 (0.078) .040 (0.042) .149** (0.108)
Ease of access to a health facility (1 if yes)	2.080* (1.097)	.069* (0.036)
Husband's desire for more children (1 if yes)	-0.0693 (0.190)	-.002 (0.006)
Working status (1 if yes)	1.502 (1.088)	.049 (0.036)
Women empowerment (1 if yes)	1.825* (1.175)	.061* (0.039)
Garissa	-0.192 (1.006)	-.006 (0.033)
Wajir	-	-
Media exposure (1 if yes)	0.0375 (1.256)	.001 (0.041)
Exposure to FP messages on mobile Phones (1 if yes)	2.358 (1.995)	.078 (0.066)
Husband 's approval of FP (1 if yes)	1.392* (0.895)	.046* (0.029)
Constant	-12.07*** (3.345)	

| Observations | 268 | 268 |

Pseudo R^2 = 0.5248

Source: Author computations, 2022

CHAPTER 5

SUMMARY, CONCLUSIONS, AND POLICY IMPLICATIONS

5.1 Summary and conclusions

In Sub-Saharan Africa, sustained rapid increment in the population poses challenges to the achievement of the Sustainable Development Agenda for 2030. It is widely accepted that modern family planning methods influence fertility reduction worldwide and have a significant impact on the health of women, children, and families, particularly in emergent nations.

The study's major purpose was to assess the individual and household level determinants of modern contraceptive use among married women in the Kenyan counties of Wajir and Garissa. Data from the 2014 KDHS was used to form a binary logistic regression model to analyse the determinants of modern contraceptive uptake by married women in the counties of interest.

The findings showed that attaining primary education and being part of the wealthiest quintile positively influenced the use of modern contraception among married women in Wajir and Garissa at 5% level of significance. In addition, at 10% level of significance, attaining secondary education, ease of access to health facilities, women empowerment and husband's approval of FP positively affected the usage of modern birth control among married women in the counties of interest. All other factors (the age of the woman, level of education (higher), household wealth index (poorer, middle, richer), working status, media exposure, exposure to FP messages, religion, county of residence, place of residence, the spouse's desire for an extra child) in the study didn't have an impact on modern contraceptive uptake.

5.2 Policy Implications

Based on the pronounced findings and the need to have a manageable family size in the three counties, this study's findings suggest that, in order to get more married women to use modern birth control in Garissa and Wajir counties, education in general should be promoted especially in these counties but also throughout the nation, with a focus on population and family size being taught in schools and different communities. This will also help in empowering these women with more knowledge.

In addition, men should also be included and educated about contraceptive usage and its benefits since their involvement plays an important role in a couple's decision-making about FP. The household wealth index should be increased through formal or informal employment but also extend targeted FP campaigns to the poor.

5.3 Suggestions for Further Research

A similar study on individual associates of modern contraceptive usage should be done using the most recent data and a comparison of the results be made. Using the current data, more detailed research that includes all women of childbearing age in these counties and any other variables not included in this study may shed more light on the subject at hand in the counties listed above.

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Appendix

1.1 VIF results 1

```
. vif

    Variable |      VIF       1/VIF
-------------+----------------------
Number_chi~n |    13.74    0.072778
Number_chi~e |    13.43    0.074451
No_education |     7.93    0.126160
     Primary |     5.38    0.186013
ThirtyFive~_ |     4.28    0.233898
wealth_index |     3.34    0.299161
  place_of_r~e |     2.93    0.341320
TwentyFive~r |     2.88    0.347759
      garissa |     2.55    0.392761
    Secondary |     2.22    0.450949
        wajir |     2.21    0.452044
       muslim |     2.01    0.498271
 Media_expo~e |     1.66    0.600633
 working_st~s |     1.48    0.673740
  roman_cath~c |     1.48    0.677689
 Husband_ap~P |     1.34    0.746300
 Exposure_F~S |     1.21    0.827261
   access_H_f~y |     1.20    0.836124
 Women_empo~r |     1.17    0.852820
 Husband_de~n |     1.13    0.886265
-------------+----------------------
     Mean VIF |     3.68

.
```

1.2 VIF results 2

Variable	VIF	1/VIF
No_education	7.77	0.128624
Primary	5.26	0.190061
wealth_index	3.31	0.302159
place_of_r~e	2.92	0.342259
garissa	2.44	0.410053
ThirtyFive~_	2.29	0.436609
Secondary	2.19	0.456153
TwentyFive~r	2.18	0.458106
wajir	2.16	0.464028
muslim	1.99	0.503693
Media_expo~e	1.66	0.601211
working_st~s	1.47	0.678938
roman_cath~c	1.44	0.694911
Husband_ap~P	1.34	0.747840
Exposure_F~S	1.20	0.834529
Women_empo~r	1.17	0.854735
access_H_f~y	1.17	0.856063
Husband_de~n	1.13	0.887015
Mean VIF	2.39	

1.3 Logistic Regression Output from Stata

```
Logistic regression                              Number of obs   =        268
                                                 LR chi2(19)     =      69.27
                                                 Prob > chi2     =     0.0000
Log likelihood = -31.357023                      Pseudo R2       =     0.5248
```

Modern_contraceptiv~e	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
fifteen_TwentyFour	.2589941	1.436554	0.18	0.857	-2.556599	3.074588
TwentyFive_ThirtyFour	.2048825	.9635327	0.21	0.832	-1.683607	2.093372
ThirtyFive_fortyNine_	0	(omitted)				
place_of_residence	.1305638	1.674151	0.08	0.938	-3.150713	3.41184
No_formal_education	2.908322	1.766389	1.65	0.100	-.553737	6.37038
Primary	4.55739	1.758675	2.59	0.010	1.110451	8.004329
Secondary	2.376745	1.587193	1.50	0.134	-.7340959	5.487586
Higher	0	(omitted)				
protestant_christian	1.863304	1.314115	1.42	0.156	-.7123147	4.438922
muslim	0	(omitted)				
wealth_index						
poorer	1.766109	1.698402	1.04	0.298	-1.562698	5.094916
middle	2.607014	1.839236	1.42	0.156	-.9978216	6.21185
richer	1.769599	1.654993	1.07	0.285	-1.474128	5.013326
richest	3.581381	1.80506	1.98	0.047	.0435289	7.119234
access_H_facility	2.080242	1.097171	1.90	0.058	-.0701743	4.230659
Husband_desire_chil~n	-.0692533	.1904016	-0.36	0.716	-.4424336	.303927
working_status	1.501964	1.088027	1.38	0.167	-.6305311	3.634458
Women_empower	1.82508	1.175282	1.55	0.120	-.4784307	4.128591
garissa	-.1915622	1.005985	-0.19	0.849	-2.163257	1.780133
wajir	0	(omitted)				
Media_exposure	.0374934	1.256266	0.03	0.976	-2.424743	2.499729
Exposure_FP_SMS	2.357612	1.99485	1.18	0.237	-1.552222	6.267445
Husband_approval_FP	1.39169	.8952283	1.55	0.120	-.3629257	3.146305
_cons	-12.07382	3.344553	-3.61	0.000	-18.62902	-5.518615

1.4 Marginal Effects

```
Expression   : Pr(Modern_contraceptive_uptake), predict()
dy/dx w.r.t. : fifteen_TwentyFour TwentyFive_ThirtyFour ThirtyFive_fortyNine_
               place_of_residence No_formal_education Primary Secondary Higher
               protestant_christian muslim 2.wealth_index 3.wealth_index
               4.wealth_index 5.wealth_index access_H_facility Husband_desire_children
               working_status Women_empower garissa wajir Media_exposure
               Exposure_FP_SMS Husband_approval_FP
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf. Interval]	
fifteen_TwentyFour	.0086082	.0477438	0.18	0.857	-.0849679	.1021843
TwentyFive_ThirtyFour	.0068097	.0320393	0.21	0.832	-.0559862	.0696056
ThirtyFive_fortyNine_	0	(omitted)				
place_of_residence	.0043395	.055708	0.08	0.938	-.1048462	.1135253
No_formal_education	.0966638	.0569011	1.70	0.089	-.0148604	.208188
Primary	.1514738	.0547063	2.77	0.006	.0442515	.2586962
Secondary	.0789958	.0513685	1.54	0.124	-.0216845	.1796761
Higher	0	(omitted)				
protestant_christian	.0619306	.0416358	1.49	0.137	-.0196741	.1435352
muslim	0	(omitted)				
wealth_index						
poorer	.0400308	.0467006	0.86	0.391	-.0515008	.1315624
middle	.0785949	.0782448	1.00	0.315	-.0747621	.2319518
richer	.0401565	.0414499	0.97	0.333	-.0410837	.1213967
richest	.1498195	.1075566	1.39	0.164	-.0609875	.3606265
access_H_facility	.069141	.0364483	1.90	0.058	-.0022964	.1405783
Husband_desire_chil~n	-.0023018	.0063392	-0.36	0.717	-.0147263	.0101227
working_status	.0499207	.0360068	1.39	0.166	-.0206514	.1204928
Women_empower	.0606601	.0387597	1.57	0.118	-.0153074	.1366277
garissa	-.0063669	.0334125	-0.19	0.849	-.0718542	.0591203
wajir	0	(omitted)				
Media_exposure	.0012462	.0417419	0.03	0.976	-.0805665	.0830588
Exposure_FP_SMS	.0783599	.0663381	1.18	0.238	-.0516605	.2083802
Husband_approval_FP	.0462555	.029336	1.58	0.115	-.0112419	.103753