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Factors Influencing Family Planning Uptake Among Adolescents and Postpartum Women in Kenya

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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2020

Abstract

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by

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Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Family planning (FP) is a cost-effective public health strategy, but the uptake is low with marked disparity among adolescents and postpartum women. However, data on these marginalized groups are limited. This quantitative, cross-sectional study sought to provide information on the factors that contribute to the uptake of FP among adolescents and postpartum women in Kenya. The 2014 Kenya Demographic Health Survey FP data were analyzed regarding the factors associated with FP uptake among adolescents and postpartum women as well as the differences by region. The factors were organized according to the socioecological model (SEM) and included intrapersonal, interpersonal, community, and organizational levels of influence. The logistic regression model was used to determine the contribution of different factors to the uptake of FP. The results indicated that compared to adolescents, older women have better socioeconomic status, and a higher proportion are using modern FP methods. On bivariate analysis, factors at all levels of the SEM were associated with uptake of FP in both groups. On regression analysis, factors that contributed most significantly to the uptake of FP were at the intrapersonal and organizational levels among adolescents and at the intrapersonal and interpersonal levels among postpartum women. Recommendations include further research on empowering adolescents to make informed choices in FP, FP interventions focusing on more than one level of SEM, and regional disparities being addressed. The information provided by this study can contribute to improved FP uptake and positive social change for adolescents and postpartum women, which means better health, economic benefits, and improved quality of life.

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Dedication

This work is dedicated to the marginalized women who struggle to get services, particularly skilled deliveries, and family planning, that their needs may be realized sooner than later.

Acknowledgments

First and foremost, I would like to thank the almighty God who has given me the grace and good health to be resilient throughout the period when I worked on this dissertation and throughout the very intense course work. To him, be the glory.

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To my family, my husband, Dr. Simon Ndiritu, and my children, Neema, Abby, and Joe, I am most grateful for standing with me and allowing me time to work on this, sometimes even at the expense of being with you. Your support will be cherished forever. To my extended family, particularly my siblings, whose encouragement and prayers motivated me.

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Section 1: Foundation of the Study and Literature Review

Introduction

Family planning (FP) refers to the preparation, knowledge, and methods that assist individuals and couples to plan and attain their desired family size and determine the spacing of pregnancy (World Health Organization [WHO], 2018). FP was prioritized internationally during the 1970s and 1980s with significant support, which led to an increase in contraceptive prevalence rate (CPR) with reduced fertility globally (Cleland et al., 2006; Mwaikambo et al., 2011). Kenya was among the first African countries to recognize the challenges associated with their high fertility and to embrace FP (Stiegler & Susuman, 2016). The family planning program was established when the total fertility rate was high at around eight children per woman and a low CPR of 7% in the 1970s (Cleland et al., 2006; Sibanda, 2010; Sindiga, 1985). With the establishment of the FP program, a sustained decrease in the total fertility rate with a rapid increase in contraceptive use ensued until a stagnation in the 2000s (Crichton, 2008) due to dwindling international support that led to funding cuts for FP programs (Cleland et al., 2006; Mwaikambo et al., 2011). The stall was more severe among specific subgroups such as younger women and those with low formal education.

Renewed focus on FP internationally and nationally has led to some success; however, the targets have not been met, and inequity has persisted. The discussion has broadened to include the impact of FP not only on the health and rights of the women and girls but also on socioeconomic development and demographic dividend (Cleland et al.,

2006; Hardee et al., 2014). Hence, there is a need to provide more focused evidence to support the ongoing efforts.

Description of the Research

Uptake of FP is a cost-effective public health strategy that faces many challenges (Ganatra & Faundes, 2016). Adolescents and postpartum women are priority groups because they have a higher unmet need for FP than the general population (Moore et al., 2015; Vogel et al., 2015). Unmet need refers to the proportion of sexually active, women of reproductive age who are capable of becoming pregnant but want to limit (do not want more children) or to space (postpone pregnancy) their children; however, they are not using FP methods (Kennedy et al., 2011). Unmet need is usually regardless of the reason why they are not using FP. Hence, there is a need for evidence that can support FP programs to enhance FP uptake in these priority groups. The current study was conducted on factors influencing FP uptake among adolescents and postpartum women in Kenya based on the 2014 Kenya Demographic and Health Survey (KDHS). The independent variables and covariates are based on the socioecological model (SEM) and were grouped as intrapersonal, interpersonal, community, and organizational.

Family Planning and Adolescents

The adolescence stage in life is critical for the realization of individuals' potential (Patton et al., 2016). But there has been limited investment in adolescents' health due to their generally good health despite facing risk and inequities when it comes to maternal health. Despite gaps in the data for adolescents, evidence points to disparity with adolescents' use of contraceptive services compared to older women, which varies across

and within countries (Vogel et al., 2015). Maternal health indicators such as maternal mortality and contraceptive prevalence have made improvements globally over the last several decades but not uniformly across all ages. The inequity in contraception uptake is particularly critical for adolescents because contraception contributes toward securing their future (Patton et al., 2016). Adolescents are also at significantly higher risk of maternal mortality and other adverse pregnancy outcomes, which is related to various factors such as the characteristics of the population, particularly socioeconomic status (Ganatra & Faundes, 2016).

Contraception is an effective intervention in preventing unintended pregnancies, which are associated with increased risks of poor pregnancy outcomes such as death and unsafe abortions (Chandra-Mouli et al., 2014; Glasier et al., 2006; Nove et al., 2014). But many births by women below 20 years of age in developing countries are unplanned, which may be an indicator of the widespread burden of unmet need for contraception (Bishwajit et al., 2017). Kenya is among the 10 countries with the highest teenage pregnancy globally (Loaiza & Liang, 2013). According to the KDHS, in 2014, 18% of girls between 15 and 19 years had begun childbearing, meaning they had already given birth or they were pregnant (Kenya National Bureau of Statistics, 2015). Early childbearing in Kenya is higher in some regions being highest in Nyanza followed by Rift Valley and Coast and was lowest in Central and North Eastern region. These differences may point to inequity in contraception access, but there may be other factors contributing to this state. Notably, the proportion of teenagers who had begun childbearing had not changed since the previous KDHS carried out in 2008, thus indicating no progress in the

utilization of contraception in the country among teenagers. Reports from some regions in Kenya and those from other countries suggest that adolescents face various barriers to using contraception, including lack of access, health concerns, and fear of side effects (Ochako et al., 2015; Woog et al., 2015). This study seeks to provide information on adolescents in Kenya that is nationally representative.

Family Planning Among Postpartum Women

Evidence suggests that optimal birth spacing, 2 to 3 years, enhances maternal and infant health and contributes to the reduction of maternal mortality (Ganatra & Faundes, 2016). Contraception reduces the high-risk births associated with short interval births and reduces fertility (Brown et al., 2015). However, though after the delivery of a child, many women desire to delay pregnancy for at least 2 years (Pasha et al., 2015), many do not start contraception within the first year, thus risking a closely spaced pregnancy (Rossier et al., 2015). There is a high unmet need for FP among postpartum women in low- and middle-income countries, including Kenya, with more than half of repeat births being within an interval that is too short (Moore et al., 2015). Unmet need for spacing is high at 29% and that for limiting at 28% in Kenya for postpartum women, with 50% of postpartum women having short birth intervals (Moore et al., 2015).

Importance of Family Planning

FP has health benefits as well as economic benefits.

Health Benefits

Kenya has high maternal and child mortality and morbidity. The 2014 national DHS estimated maternal mortality at 362 deaths per 100,000 live births, neonatal

mortality at 22 deaths per 1,000 live births, infant mortality 39 deaths per 1000 live births, and under-5 mortality at five deaths per 1,000 live births (Kenya National Bureau of Statistics, 2015). A maternal death often means the loss of healthy young productive women at the prime of life, resulting in economic and social losses. But FP is a cost-effective public health strategy that improves maternal and child survival (Ganatra & Faundes, 2016). Contraception has been shown to save hundreds of thousands of women's lives within a year by averting maternal deaths (Ahmed et al., 2012).

Economic Benefits

Kenya has continued to develop economically, but the progress is not uniform with some areas, particularly the hard to reach arid counties and specific segments of the population such as the youth (Kenya National Bureau of Statistics, 2018). These marginalized areas are also under-served in regard to services and have the worst maternal and child health indicators, including low FP uptake (Kenya National Bureau of Statistics [KNBS], 2018). However, FP is a public health strategy that promotes economic growth and improves maternal and child health. Fertility decline improves women's quality of life and affords them more time to participate in income-generating activities, thus improving the well-being of the family (Canning & Schultz, 2012). FP has been estimated to save billions of shillings, which can be availed for development purposes, thus stirring economic growth and contributing to the improvement of the general quality of life (Frost et al., 2014). FP saves money by preventing unintended pregnancies and their adverse outcomes such as abortions and low birth weights and by enabling women to be more productive. The government can then channel the saved

funds into other development initiatives. Thus, improving the FP uptake in the marginalized areas has the potential for positive social change. Health and economic benefits can result in better educated and healthier children, leading to less dependency in the society with overall enormous macroeconomic, demographic benefits (Canning & Schultz, 2012).

Importance of this Study

The Kenyan constitution has recognized health, including reproductive health, as a right (National Council for Law Reporting (2010). Given that FP is a cost-effective public health strategy with many benefits, it is imperative to have all the eligible people of Kenya access the service equitably. To achieve the sustainable development goal benchmark of a CPR of at least 75% by 2030 in all countries, the majority of states, including Kenya, need to accelerate the uptake of FP (Choi et al., 2015). Though the CPR in Kenya has been increasing with the 2014 Kenya DHS reporting a CPR of 58% among married women and 65% among sexually active unmarried women, it fell short of the national target of 70% (Kenya National Bureau of Statistics, 2015).

Further, though there is information focusing on the general population in Kenya, none focuses on adolescents and postpartum women. Analyzing the available data concentrate on these groups is a cost-effective and efficient way of getting critical and relevant information. Cost-effectiveness and efficiency are crucial given the limited funding for health and particularly for public health globally (Shi, & Johnson, 2014). For healthier lives, developing countries like Kenya need to develop homegrown solutions that are in line with their realities (Agyepong et al., 2017). Local research is necessary to

inform priorities and national strategies and provide evidence to support program implementation. This study provides relevant information for the FP program that will support increased FP uptake among the priority groups and thus harness the benefits associated with women's and girls' use of contraception.

Potential Positive Social Change Implications

FP is a cost-effective public health intervention with many positive social change implications. FP improves the health of women and their children and empowers adolescent girls to avoid unintended pregnancy, thus enhancing their opportunity to pursue education. Education promotes economic independency, which enhances general quality of life (Canning & Schultz, 2012). Additionally, fertility decline reduces youth dependency, further strengthening economic growth. Further, increased uptake of FP by preventing unintended pregnancies and the consequences saves millions of dollars that are made available for other social services and economic development, thus improving the general quality of life for all and not just women (Canning & Schultz, 2012).

Problem Statement

Despite the knowledge that FP is one of the most cost-effective public health strategies that can contribute to the improvement of maternal health, empower women and girls and spur economic growth, there are many challenges associated with developing successful FP programs (Stiegler & Susuman, 2016). Access to FP for all women of reproductive age has been recognized internationally for several decades, as evidenced by inclusion in various international commitments and initiatives such as the International Conference on Population and Development Programme of Action, the

millennium development goals, and most recently in the sustainable development goals and the FP 2020 (Hardee, et al., 2014a; Hardee, Kumar, 2014b; Woog et al., 2015). Despite progress, millions of women are still without access to voluntary FP (Kissoon et al., 2015).

Many studies have been undertaken to study the various factors influencing FP uptake in different geographical areas. For instance, a cross-sectional multi-country analysis of DHS data for low- and middle-income countries revealed that different factors influenced FP uptake differently. Community-level education attainment influenced FP uptake positively, whereas gender and fertility-related norms influenced contraception uptake negatively. Exposure to media did not have a positive influence on the FP uptake (David & Allan, 2018; Mutumba et al., 2018). However, these results are not uniform across all these countries, and there is a need to analyze specific country data for context-specific results. For example, in Zambia, a qualitative study revealed that health system factors such as long distances, stock-outs, and unfriendly policies negatively influenced the uptake of FP (Silumbwe et al., 2018). Community-level barriers to uptake of FP included myths and misconceptions about FP, side effects experienced by some community members, social stigma, and harmful cultural and religious beliefs (Silumbwe et al., 2018).

In Kenya, studies have been undertaken to determine the factors influencing FP uptake in different areas. Limited geographical coverage and aggregate outcomes on FP use have shown progress in the use of FP, but they tend to mask the diversity across the country (Cahill et al., 2018). Amo-Adjei et al. (2017) did a multipronged intervention to

increase FP uptake in two high fertility counties in Kenya. The interventions included improving the health service delivery through training of health service providers and supporting commodities availability. The initiative reported an increase in FP uptake in the two counties with the total fertility rate dropping from 5.4 to 4.2 in Siaya and from 5.6 to 4.7 in Busia, while the unmet need for FP also dropped from 32 to 23% and 26 to 21% in Siaya and Busia counties respectively. Despite these improvements, the total fertility rate and the unmet need are still high and need to improve further (Amo-Adjei et al., 2017). Another study focused on the factors associated with FP uptake among postpartum women in a county hospital. Sociodemographic factors such as age, marital status, and being employed, as well as the quality of the services, were found to be associated with uptake of FP among the postpartum women (Jalang'o et al., 2017). A third of women who did not want more children were not on any contraceptive, indicating a high unmet need for FP (Jalang'o et al., 2017).

As highlighted, various factors have been found to influence the uptake of FP. However, these factors vary regionally, nationally, and even sub-nationally and affect the different segments of the population differently, hence the importance of studying specific population targets (Li et al., 2019; Stiegler & Susuman, 2016). The need for studies focusing on particular contexts (priority populations, subnational, and community level) has been recommended to inform FP policy and programming (Dennis et al., 2017; Do & Hotchkiss, 2013; Patton et al., 2016). There is limited information on adolescents and postpartum women and particularly for the marginalized areas in Kenya, where FP uptake is the poorest. Thus, factors influencing FP uptake among adolescents and

postpartum women in Kenya are not well understood, and it is not known how they differ by region. The KDHS collects a lot of essential data on FP that is nationally representative and is in line with national priorities and strategies; however, the analysis is not detailed, particularly on the adolescents and postpartum women. Though these raw data are available, the analysis is limited. This study utilized the available KDHS data to provide nationally representative and specific information on the factors associated with FP uptake among adolescents and postpartum women, to support the implementation of the FP program for these priority groups.

Purpose of the Study

Given the need for focused FP data for effective program implementation to enhance uptake of contraception, this study sought to examine the factors that contribute to FP uptake among priority groups (adolescents and postpartum women) in Kenya. The data were from the Kenya DHS (KNBS, 2015). Another purpose of this study was to provide feedback that can inform subsequent KDHS questions in the future. It will also act as a baseline for comparison with future surveys on the status of factors influencing FP uptake across the counties for postpartum women and adolescents and youths.

The primary dependent variable was the uptake of FP, but other critical measures of FP utilization such as unmet need and discontinuation were examined. The independent variables included the personal, interpersonal, community, and organizational factors. These factors have been described in relation to FP uptake and the associations determined among adolescents and postpartum women. The differences by regions were also a focus. The sociodemographic characteristics included education,

wealth status, and residence (rural vs. urban), and intrapersonal characteristics included exposure to media, and knowledge of FP (Do & Hotchkiss, 2013; Jalu et al., 2019; Mutumba et al., 2018). Interpersonal factors included involvement of partners and making decisions for the woman (Shahabuddin et al., 2019; Wegs et al., 2016). Community factors included having heard FP messages from community leaders (Jalu et al., 2019; Silumbwe et al., 2018; Wegs et al., 2016). Organizational factors included mainly interaction with health workers (Kumar et al., 2020). Characteristics related to utilization of maternal and child health services such as facility delivery, seeking antenatal care (ANC) and postnatal care (PNC) were treated as covariates (David & Allan, 2018; Do & Hotchkiss, 2013; Vogel et al., 2015).

Research Questions and Hypotheses

Secondary data analysis was done to answer the following research questions and the associated hypotheses:

Research Question 1: To what extent are intrapersonal, interpersonal, community, and organizational factors (independent variables) associated with the uptake of FP (dependent variables) among adolescents in Kenya?

$H_0$1: Intrapersonal, interpersonal, community, and organizational factors are not associated with the uptake of FP among adolescents in Kenya.

H_a1: Intrapersonal, interpersonal, community, and organizational factors are associated with the uptake of FP among adolescents in Kenya.

Research Question 2: To what extent are intrapersonal, interpersonal, community, and organizational factors (independent variables) associated with the uptake of FP (dependent variables) among postpartum women in Kenya?

$H_0$2: Intrapersonal, interpersonal, community, and organizational factors are not associated with the uptake of family planning among postpartum women in Kenya.

H_a2: Intrapersonal, interpersonal, community, and organizational factors are associated with the uptake of family planning among postpartum women in Kenya.

Research Question 3: To what extent are the intrapersonal, interpersonal, community, and organizational factors (independent variables) associated with family planning uptake (dependent variables) among postpartum women and adolescents differ by counties in Kenya?

$H_0$3: Factors associated with family planning uptake among postpartum women and adolescents in Kenya do not differ by counties.

H_a3: Factors associated with family planning uptake among postpartum women and adolescents in Kenya differ by region.

Intrapersonal factors included information and knowledge on FP, exposure to media, ability to make decisions, and perceptions on FP. Interpersonal factors included partner and other family involvement in decision. Community factors included mean age at marriage, mean age at first birth and mean age of first sexual intercourse, household decision-making norms, and the ideal number of children perceptions. Organizational factors included access and availability to the services (distance and cost) and counseling on FP. Co-variables were also analyzed: age, education level, wealth status, area of

residence, obstetric history (parity, seeking ANC and delivery services), and utilization of other maternal and child health services such as PNC and immunizations. FP uptake was evaluated in terms of those who use FP and those who do not use, in relation to their need for birth spacing or limiting births and sexual activity. Discontinuation of methods was described and related to independent variables.

Theoretical Foundation for the Study

Theory refers to the systematic explanations concerning a particular issue and attempts to answer the *why* question, particularly as regards a behavior (Babbie, 2017). Thus, theoretical frameworks or models direct research to focus on the relevant areas. Theories are built through analysis of observations that focus on making sense of occurrences, coming up with various propositions or hypotheses. These prepositions are then used as bases of research questions, and from the research, the theory is further tested (de Vaus, 2001).

This study used the SEM, which is based on the ecological model that was proposed by Urie Bronfenbrenner (Bronfenbrenner, 1989). It was introduced in the 1970s as a conceptual model for understanding human development and was further developed into a theory (Bronfenbrenner, 1977). Bronfenbrenner (1977) advocated for a broader approach in studying human beings that would consider their interaction with the changing environment, both the physical and the social context. The model posits that behavior is influenced by the interaction with the environment and implies reciprocal causation. The environment was described as micro, meso, exo, and macro, and different variations based on the model have been developed (McLeroy et al., 1988).

The SEM used in this study has been developed to describe intrapersonal (individual), interpersonal (family, friends), community, organizational, and policy level influences on behavior (McLeroy et al., 1988; National Institute of Health, 2005). This model is in line with the current thinking in health promotion that behavior change should not only focus on the individual but also on the environment created by family, friends, and the community as well as the organizational and policy interactions with the individual (National Institute of Health, 2005). This ecological approach considers a broad perspective in dealing with complex public health challenges. It has been adapted by the Centers for Diseases and Prevention for various health promotion initiatives (Sallis et al., 2008). The SEM has been used widely to study individuals in their ecological contexts, including adolescents (Neal & Neal, 2013). The use of maternal and child health services, including FP are influenced by the interaction of the individual with others (family, friends, and community), health systems, and policies (Kissoon et al., 2015). FP uptake is a complex health behavior that must, therefore, be approached from a broad perspective rather than a simplistic view.

Other studies have successfully used the SEM to study the uptake of maternal health services, including FP. For example, Shahabuddin et al. (2019) studied the maternal healthcare-seeking behavior of married adolescent girls in Nepal. They found that at the individual level, the perceptions, inadequate knowledge, low decision-making autonomy, and dependency on the husband influenced seeking services. At the interpersonal level, the partners and mother-in-laws made the decisions for many of the girls. At the community level, certain traditional practices influenced the girls' decisions

while at the health system level, unfriendly services that were difficult to access discouraged utilization of services (Shahabuddin et al., 2019). Additionally, Silumbwe et al. (2018), in a qualitative study in Zambia, found that various community-level factors and health system factors influenced the uptake of FP services. In Ethiopia, Jalu et al. (2019) identified barriers to the uptake of maternal health services, including FP in the intrapersonal, interpersonal, organizational, and the policy level. The majority of these studies are qualitatively done in different parts of Asia and sub-Sahara Africa. They have described different constructs in the SEM that are reported to influence the uptake of maternal health services, including FP. These being qualitative studies, they are not generalizable, and the association of FP uptake by different SEM level factors could not be tested statistically. Hence these studies' level of evidence is weak, but they generate hypotheses for testing.

This study focused on intrapersonal, interpersonal, community, and organizational factors, as outlined in the research questions. Figure 1 illustrates the different constructs in each level that influence FP uptake either negatively or positively. Table 1 demonstrates how different variables were used to measure the SEM construct at different levels.

Figure 1

Conceptual Framework for Factors Associated with Family Planning Services Uptake

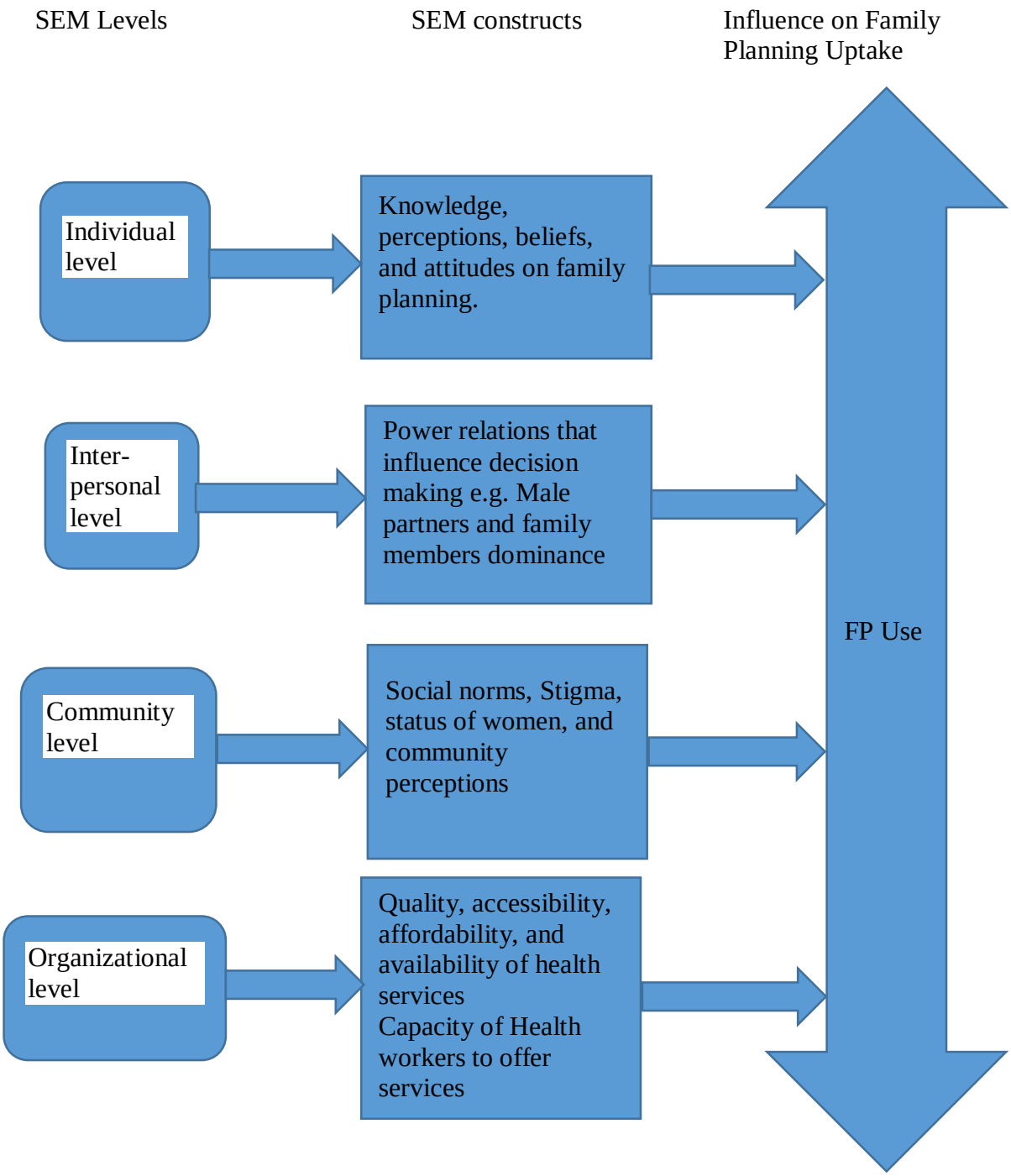

Table 1

Variables for Measuring Socioecological Model Constructs

SEM Levels	SEM constructs	Variables
Individual level	Knowledge of FP methods	Ever heard of a method Heard FP messages from various sources
	Access to information	Have access to newspaper, radio, television Access messages through a mobile phone community health workers health care providers
	Perceptions on family planning.	If given as a reason for not using FP
	Beliefs, and attitudes	If given as a reason for not using FP
	Self-efficacy	If given as a reason for not using FP
Interpersonal level	Power relations	If there was a discussion with the partner If the partner is aware of FP use If given as a reason for not using FP If the partner or another member of the family makes the health care decisions
Community	community level fertility norms community level	Having heard community leaders talk favorably on FP
Organizational level	Accessibility	If given as a reason for not seeking FP services
	Quality	If given as a reason for not seeking FP services
	Affordability	If given as a reason for not using
	Availability	If given as a reason for not seeking FP services
	Interaction with health workers	Discussed FP issues with health workers Seeking of other related services
	Capacity of health workers offer services	Provide asking clients FP needs

The KDHS has quantitative information for each of the selected levels of the SEM. Though not much information for the policy level is available from DHS questions, for this level, some of the organizational factors such as the quality of services and cost relate to policy. Hence, the policy affect FP uptake are discussed. Various research has shown that different factors influence FP uptake; however, different studies have yielded conflicting results on some factors such as age and knowledge of FP. Jalang'o et al. (2017) found younger age to be positively associated with uptake of FP, whereas Mutumba et al. (2018) found older age rather than younger to be positively associated with FP use. Though Prata et al. (2016) and Ajero et al. (2016) reported an association between knowledge and FP uptake, other studies have reported having knowledge and a positive attitude did not translate into FP use among university students (Gbagbo & Nkrumah, 2019). The extent of influence differs depending on the population and the context. This study has added to the evidence on the association of different factors at a different level of the SEM to the use of FP among adolescents and postpartum women. Unless different levels are addressed, change in a complex behavior like FP uptake will not be successful. Knowledge of the status of these factors in different regions will contribute to the determination and implementation of appropriate measures for FP uptake (Patton et al., 2016).

Nature of the Study

This was a cross-sectional quantitative survey. The study sought not only to describe the factors that are associated with FP uptake but also to determine the extent to which these factors are significant. Quantitative data are amenable to statistical

manipulation of the different variables (Creswell & Creswell, 2017). Following statistical methods, it is possible to determine if the differences in the outcome between the two groups are by chance or are due to the factors being studied. Various statistical tests, such as regression analysis, are available for manipulating quantitative data. Common assumptions to ensure sound results include a large random sample that is representative of the population for inference to be made.

Data were analyzed from the nationally representative KDHS collected in 2014. The 2014 data set was selected since the next KDHS is yet to be conducted. The DHSs are nationally representative population-based household studies conducted in many countries. They have been conducted since 1984, primarily funded by the U.S. Agency for International Development, and individual countries receive technical support from the DHS program (International Household Survey Network, 2019). So far, more than 400 surveys in over 90 countries have been done and disseminated (ICF International., n.d.). The self-reported questionnaire targets women of reproductive age, 15-49 years of age, living in the sampled households and collects a wide range of questions related to health, including fertility, FP, maternal and child health, among others. The questionnaires include sociodemographic such as education level, wealth status, access to various amenities such as water, and areas of residence. Reproductive health data include knowledge on FP methods, altitude, practice, and service utilization, including related factors. Given this range of information, the various variables of interest were identified and recoded as necessary. The KDHS data were collected by the KNBS with technical

assistance from partners such as the ICF Micro, who have experience in conducting similar surveys across many countries (KNBS, 2015).

The variables addressed in this study included sociodemographic characteristics (education attainment, wealth status, literacy level, marital status and areas of residence), intrapersonal factors (exposure to media and knowledge of FP knowledge on FP), community factors (leaders talking positively on FP), and organizational level variables included and the utilization of maternal and child health services as covariates. The study describes the different adolescent and postpartum women characteristics and the association to FP use. The factors that were found to be significantly associated with uptake of FP were analyzed further to determine if they differed by region.

Literature Search Strategy

The Walden library was used to search various databases. ProQuest Nursing & Allied Health Source, ProQuest Health & Medical Collection, and CINAHL & MEDLINE, Google, and Google Scholar were used to search general papers from professional organizations such as the world health organization and the U.S. Department of Health Services. Keywords and combined word searches were done informed by the research questions, the population, geographical area, key-dependent variables, and key independent variables, and the database. Keywords searched included:

- The primary dependent variable *family planning* and *family planning uptake*
- To get insight into the social problem and benefits of FP, *maternal mortality* and *family planning*, *family planning* and *development*, *unmet need for FP*

- The population (priority groups) *adolescent* or *adolescence* or *youth,* and *FP, postpartum FP*
- Geographical area: *Kenya* and *Sub-Saharan Africa*
- Independent variables: *Family planning uptake determinants,* and *community-based workers* (factors associated with the dependent variable),
- The database *demographic and health surveys*
- Other concepts: *FP quality of services, Rights-based FP, method mix*
- Theoretical framework: *socio-ecological*

Searches mainly focused on studies published no later than 5 years, but older studies were used in case more recent studies were limited. For example, seminal articles on the SEM, the theoretical model used for this study, and articles on the historic progress on the family program in Kenya necessitated the inclusion of older articles. Peer-reviewed articles were preferred, but publications by organizations such as the WHO, the U.S. Department of Health Services, and the government of Kenya were also used. Primary searches were done using the Walden Library, and reference lists from the selected articles were reviewed to identify any other relevant articles that had not have been identified through the initial search.

Literature Review

Family Planning Methods

Unwanted pregnancies are associated with many poor and sometimes terrible health and social outcomes as well as economic losses. FP is the primary public health strategy to prevent unwanted pregnancies (Ahmed et al., 2012; Ganatra & Faundes,

2016). According to the WHO (2018), various methods can be used for planning pregnancy to achieve desired reproductive goals. Though the term FP is often used to refer to preventing pregnancy, it does include fertility treatment to enhance conception. According to the WHO, the following FP methods are available for use: combined oral contraceptives, progestogen-only pills or "the minipill," implants, progestogen-only injectables, monthly injectables or combined injectable contraceptives, combined contraceptive patch and combined contraceptive vaginal ring, intrauterine device (IUD): copper-containing or levonorgestrel, male condoms, female condoms, male sterilization (vasectomy), female sterilization (tubal ligation), lactational amenorrhea method (LAM), emergency contraception pills (ulipristal acetate 30 mg or levonorgestrel 1.5 mg), standard days method, basal body temperature method, two day method, sympto-thermal method, calendar method or rhythm method, and the withdrawal (coitus interruptus) method.

Different FP methods have different levels of effectiveness based on their use (WHO, 2018). The combined oral contraceptives contains estrogen and progestogen, and even though with correct use it is > 99% effective, the effectiveness drops to 92% with the ordinary use. The progestogen-only pills can be used by breastfeeding women and is up to 99% effective with correct use but with typical use is 90–97% effective. Implants consist of progesterone and are about 99%. The injectables are 99% effective with correct use and 97% effective with ordinary use. The contraceptive patch and the contraceptive ring are relatively new, and research on the effectiveness is ongoing. The IUDs are up to 99% effective. Male condoms are up to 98% effective with consistent and correct use but

on average are 85% effective as commonly used. The female condom is 90% effective with correct use but drops to 79% with the common use. Vasectomy is more than 99% effective after 3 months, and the tubal ligation is more than 99% effective as well. LAM is as high as 99% effective with correct use, but it is a temporary FP method that utilizes the natural effect of breastfeeding on fertility. Emergency contraception pills are 98% effective when used correctly. The standard days method is a fertility awareness method that utilizes cycle beads or other aids and is up to 95% effective when used correctly and 88% effective as commonly used. Basal body temperature method is also fertility based that utilizes changes in body temperature and is up to 99% effective when used correctly and consistently, but effectiveness reduces to 75% with common use. The 2-day method is a fertility awareness method based on cervical mucous. It is 96% with correct and consistent use and 86% with common use. The sympto-thermal method is a fertility awareness method that is based on cervical mucous and body temperature. It is 98% effective with correct use. The calendar method or rhythm method is a fertility awareness method that utilizes the pattern of the menstrual cycle. It is up to 91% effective with correct use, and effectiveness reduces up to 75% with common use. The withdrawal method entails the man trying to keep sperm out of the vagina to prevent pregnancy. It is up to 96% effective when used correctly and consistently, and it is 73% effective with typical use (WHO, 2018).

FP methods can also be classified into traditional methods and modern methods (WHO, 2018). Natural methods are based on abstaining from sex to avoid pregnancy (Pallone & Bergus, 2009). Most organizations list the methods either as traditional or as

modern without stating the criterion (Hubacher & Trussell, 2015). The methods that use hormones or devices to control fertility seem to be universally accepted as modern methods. However, the fertility awareness-based methods have raised controversy, with some being classified as modern methods and others as traditional without clear guidelines (Hubacher & Trussell, 2015; United Nations et al., 2013). Some methods use technology to identify the fertile days to support abstinence, thus contributing to the controversy. The WHO (2018) listed fertility awareness methods such as the sympto-thermal method, 2-day method, basal body temperature method, and standard days as modern methods, and they classified calendar method or rhythm method and withdrawal (coitus interruptus) as traditional methods. Additionally, the United Nation Population Fund (UNFPA), the Guttmacher Institute, and the DHS Program all named the LAM as a modern method (International Household Survey Network, 2019; Singh, Darroch & Ashford, 2014). Traditional methods are generally not as effective as modern methods in preventing pregnancy (Pallone & Bergus, 2009).

The DHS collects information on the most common methods in a country and on both natural and modern methods of contraception and thus provides relevant information on the different methods that are used in a population (DHS Program, 2019). LAM is of particular interest since it is freely available, does not need to be provided by a health worker, and it is effective and with no side effects. All the women need is to have proper knowledge of how to use it. It is considered a modern contraceptive method for postpartum mothers who meet the criteria of its use (International Household Survey Network, 2019; Singh et al., 2014). When used correctly, LAM is up to 98% effective.

Three sets of criteria must be set to ensure protection: mother must have amenorrhea, be fully or almost fully breastfeeding, and the infant must be less than 6 months. However, there is concern that many postpartum mothers do not have the right knowledge on how to apply this freely available method and hence miss out on the potential benefits. Fabic and Choi (2013) found that only 26% of LAM users met the criteria for correct and valid LAM.

Method Mix

In considering the uptake of FP, the method mix significant, as it reflects on the right of women to make an informed choice (Bertrand et al., 2014). Method mix refers to the distribution of the FP methods by users, and reliance on one method by a vast proportion of the users is considered skewed. Access to diverse methods enhances the choice a woman has and is an essential component of voluntary contraception, which is a right (Hardee et al., 2014b). Skewed method mix may indicate inadequate access to other methods either due to limitations in supplies and health worker's skills, provider bias, or even community bias (Bertrand et al., 2014). The most used method in Kenya is the injectable among youths and adolescents as well as the older women (Dennis et al., 2017). The longer-acting methods, such as the intrauterine copper device and the implants, are more cost-effective and are associated with less discontinuation compared to the short-acting methods (Benson et al., 2017; Keesara et al., 2018; Ochako et al., 2015). Besides the user characteristics, the technology, including the logistics associated with the use of the longer-acting methods, contribute to the reduced likelihood of discontinuation (Hubacher et al., 2017). It would, therefore, be more desirable to have

women use the longer-acting methods. Organizational factors like social franchising have provided more access to FP services, and more women took up the more cost-effective, longer acting, and permanent methods (Chakraborty et al., 2016). Further, in various urban cities in Kenya, a project designed to increase FP uptake increased the overall use of FP, and the use of LAM increased considerably (Benson et al., 2017). There were tailored messages and improved access to a wide range of methods during the project, which positively influenced the uptake (Benson et al., 2017). However, information on the method mix among adolescents and postpartum women are limited in the Kenyan context, though the DHS has information on the methods being used and the reasons.

This study will describe the method mix among adolescents and postpartum women and relate this to different factors to determine which ones influence the use of particular methods. The information on whether the method mix is appropriate among the adolescents and postpartum women is critical for the FP program. Such information will be useful to enhance the effectiveness of reaching these groups. It will also inform the policymakers and program managers if changes are needed, for example, in terms of access to the different methods to support a better method mix. A more comprehensive range of method mix increases the use of FP as well as enhances the benefits by having clients use the methods that best suit them as well as the more cost-effective methods (Jain & Winfrey, 2017).

Unmet Need for Family Planning

Unmet need for FP has been significantly associated with the total number of pregnancies, the number of children alive, approval of contraception by the partner, and

discussion of FP within the couple (Ajong et al., 2016). Unmet need for FP is an indicator in assessing the performance of FP programs (Vogel et al., 2015). Reducing the unmet need for FP is one of the cost-effective public health strategies in low- and middle-income countries with significant benefits for both mothers and infants, reducing demand for abortion as well as vertical transmission of HIV (Zakiyah, et al., 2016). Investing in access to modern contraception, reducing unmet need for contraception is more cost-effective than retaining the status quo of limited access (Zakiyah, et al., 2016). Evidence is needed to support favorable decisions to support FP uptake at all levels to reduce the unmet need. FP use is related to the unmet need. By describing the uptake of FP among adolescents and postpartum women, this study will provide information that could be helpful in reducing unmet need in these groups.

Adolescents

Adolescents form a significant and growing proportion of the population in Sub-Saharan Africa and Kenya, yet their health needs have not received adequate attention. It is important to curb adolescent pregnancies to contribute to ending preventable maternal deaths. Various factors such as physical immaturity, low socioeconomic status, and sociocultural norms and practices make adolescent pregnancies in the developing world riskier with poor outcomes. The majority of these pregnancies are unintended; some result from early and forced marriages with unmet need for contraception (Vogel et al., 2015).

Different researchers have studied the use of FP among youths and adolescents and have documented different results. Gbagbo and Nkrumah (2019) did a study among

young unmarried women in a tertiary institution in Ghana and established that the students had knowledge of FP and a positive attitude; however, the knowledge and a positive attitude did not translate into FP use because of availability and accessibility. The emergency contraceptive was the most used since it was widely available without the need to go to a health facility that the they would rather avoid due to perceived stigma (Gbagbo & Nkrumah, 2019). These results suggest that there may need to restructure the information content on FP by FP programs targeting youth. Additionally, these results point to the need to target more than one level of the SEM in interventions to increase FP uptake.

In another study on FP, Shahabuddin et al. (2019) explored married adolescents' maternal health care services, including FP seeking behavior in Nepal. They interviewed community health workers, family members, and government officials. They used the SEM to analyze and report the findings. Intrapersonal factors such as knowledge on the services, dependency on partners, and low autonomy in decision-making influenced their use of FP. At the interpersonal level, the mothers-in-law, partners, and other family members influenced whether these adolescents used FP. At the organizational level, unfriendly, inaccessible services, and inflexible operating hours negatively influenced the uptake of services. In contrast, supportive community environment such as the availability of female community workers and women groups through which information is shared positively influence the uptake of services (Shahabuddin et al., 2019). The findings may not be generalized to Kenya due to differences in the context; however, the

study provided information on variables that can be used to determine the significance of these factors within the specific context.

Finally, Woog et al. (2015) analyzed adolescent women's need for and use of adolescent health services, including FP in developing countries such as Kenya. They used the KDHS 2008–2009. The adolescents reported not using contraception due to intrapersonal factors, not being married, and infrequent sex. However, sexually active adolescents are at the risk of unwanted pregnancy despite the frequency of sex and marital status. The adolescents also reported organizational factors, lack of access, health concerns, and fear of side effects as reasons for the non-use of FP (Woog et al., 2015). The KDHS 2008–2009 is a nationally representative survey in Kenya; the more recent KDHS 2014 was used for this study to provide detailed information on the use of contraceptives by adolescents in Kenya.

Postpartum Women and Postpartum Family Planning

The postpartum period is the time soon after delivery up to 6 weeks after, but for contraception, up to 1 year is considered (WHO, 2013). It is a critical period because if not protected, a sexually active woman is at the risk of pregnancy, leading to too close spacing of pregnancy (Rossier et al., 2015). In a multi-country prospective study to assess fertility intentions, contraceptive use, and unmet need for FP among postpartum women 6 weeks post-delivery, Pasha et al. (2015) found that of the 36,687 women in the study, only 5% wanted to have a pregnancy within the first year after delivery. Despite the majority not desiring to get pregnant, there was a huge unmet need for FP ranging from 25% to 96%. Of those using modern methods, only a small proportion was on the more

effective long-acting reversible contraceptives. In this study, factors associated with high unmet included; young age of fewer than 20 years (adolescents), low parity of two or three, low education level, and women delivered at home (Pasha et al., 2015). Pasha et al. (2015) analyzed several countries' data; however, for more specific national and sub-national data, secondary analysis of the national data is critical. This research provided specific information on the factors associated with FP uptake among the Kenyan postpartum women.

Rossier et al. (2015) analyzed data from 5732 women, some being from sub-Saharan Africa. They found that 43 percent of the women had an unmet need for FP at six weeks postpartum, while 32 percent had an unmet need at the end of amenorrhea during the first year of delivery. There is the challenge of women relying on LAM even when they are not protected (have not met the criteria) (Rossier et al., 2015). Though DHS are nationally representative, the results of this study are according to regions rather than countries. For specific information at the national and subnational levels, it is crucial to analyze country-specific data.

An analysis of DHS data from 21 low and middle-income countries, including Kenya, revealed high unmet need among postpartum, with more than half of the repeat births being within an interval that was too short (Moore et al., 2015). Though the DHS data is nationally representative, specific, and more recent and detailed information for Kenya was obtained by analyzing the latest Kenyan DHS. Another study in Northern Tanzania revealed that though only 11% of postpartum women wanted pregnancy within two years of delivery, 56% were at risk of pregnancy, and 36% of the new pregnancies

during the follow-up period were unwanted (Keogh et al., 2015). The study involved the intervention of targeted counseling during the ANC and in the postpartum period. Therefore, the results may not be generalized to a population that receives routine services (ANC and PNC) and may not be applicable in another country.

Muamah et al. (2015) found that 15.9% of women were not protected against pregnancy by the end of their first postpartum year. Though most postpartum women wanted to space pregnancy by at least two years, most were using short-acting methods. In another study, as many as 80% of the postpartum women used the less cost-effective short-term FP methods (Moore et al., 2015). Analysis of the 2014 DHS has provided more evidence.

The concept of unwanted pregnancy is not appreciated among married women as it is seen as applying more to unmarried adolescents and young women (Capurchande et al., 2017). Hence, married women may not appreciate spacing given the many misconceptions around contraceptives and fear of side effects making some women feel like the risks of contraception outweigh the benefits. Factors Influencing Family Planning Uptake (Independent Variables)

Many studies have looked at the factors that influence the uptake of FP, particularly in the developing world, where CPR remains low with high unmet needs. Most of these studies are not nationally representative for Kenya, but they provide useful insights on what to study for context-specific information.

Intrapersonal (Individual) Factors

Intrapersonal or individual factors, as described in the SEM, influence FP uptake. Intrapersonal factors are the intrinsic individual characteristics that influence behavior (National Institute of Health, 2005). They include characteristics such as knowledge, attitudes, beliefs, values, and personality traits.

Fertility and how to control it either using natural or modern methods is a technical subject that requires correct information and skills. The subject is made more complicated by myths, misconceptions, and wrong information (Silumbwe et al., 2018). Like many other modern drugs, modern contraceptives have documented side effects such as irregular bleeding and nausea, and the clients need correct information. Information on the potential side effects and how to address them is critical. The risk of side effects is low for modern methods and, in most cases, minor. Unfortunately, misunderstanding the small risk and exaggeration has led to unwarranted fear of modern methods. Women may recognize the need for spacing pregnancies, but fear of real side effects and misconceptions greatly influences contraceptive use. Fear of side-effects is associated with contraception non-use (Ajong et al., 2016; Nanvubya et al., 2015). Misconceptions such as contraceptives leading to malformed babies, IUD penetrates the body, infertility, paralysis, and need for hysterectomy are reasons for non-use of FP (Keesara et al., 2018; Ochako et al., 2015). Some fear that though they would be willing to use contraceptives against their partners' approval, side effects such as irregular and excessive bleeding and loss of libido would expose them.

Prata et al. (2016) conducted a household survey to document factors associated with modern FP methods among Angolan women of reproductive age. The analysis was stratified between adolescents and youths (15-24 years) and older women (25-49 years) to determine the effect of age with different variables. Among all ages, the intrapersonal factors associated with FP uptake were contraceptive accessibility perception, contraceptive knowledge, and self-efficacy. Being exposed to FP information from various sources such as media self-efficacy of FP and marital status was positively associated with contraceptive use among adolescents and youths. Among the older women receiving information about FP from a pharmacy was associated with contraceptive use (Prata et al., 2016).

Despite increasing reports of growing widespread FP knowledge in Kenya and other countries, some areas, particularly in the rural setting, where correct knowledge is low (Jalu et al., 2019; Mutombo et al., 2014). In a cross-sectional qualitative study done in the Somali region in Ethiopia, Jalu et al. (2019) explored the factors affecting health-seeking behavior. They interviewed women of reproductive age and their partners, health extension workers (HEWs), health care providers, and health administrators. They found that there was limited knowledge of modern methods. The limited knowledge of contraception and fear of modern health practices negatively influenced contraceptives use (Jalu et al., 2019). In Nepal, Shahabuddin et al. (2019) found that women, particularly adolescents, had little knowledge of FP, which negatively influenced FP's uptake.

Additionally, though knowledge is critical in the use of FP, studies have demonstrated a discrepancy between knowledge of FP and use. Despite immense knowledge of FP or the need to avoid pregnancies, clients' practices on use do not march the knowledge. In a qualitative study in Mozambique by Capurchande et al. (2017), they found very high levels of knowledge of FP, but this did not translate to the use of FP. Thus, knowledge alone is not enough to change behavior.

Other individual factors that negatively influence FP uptake include perceptions of FP and fertility. In a qualitative study done in Uganda by Nanvubya et al. (2015), women's desire for more children negatively influenced contraception. Some women consider it their religious requirement to follow the husband's decision on whether or not to use FP (Jalu et al., 2019).

Besides knowledge and perceptions of FP, Women's agency and self-efficacy in deciding whether to use contraception or not is critical and relates to a woman's empowerment (Prata et al., 2016; Wegs et al., 2016). Empowerment, as shown by access to money, freedom of movement to seek services, and making fertility decisions, is a critical personal factor that positively influences FP uptake (Reed et al., 2016). Being able to make household decisions is part of women's empowerment. Those women who make general household decisions are more likely to use modern contraceptives (OlaOlorun & Hindin, 2014). These studies are not specific to Kenya; this study has looked at intrapersonal factors are proxies to women empowerment and the association with using FP in Kenya.

Self-efficacy is an important aspect that influences the use of FP. It encompasses the capability to use contraceptives correctly and consistently and the ability to negotiate with a partner. The ability to discuss with partners, tell the husbands they want to use FP, use FP, and use it even without the partner's approval is an integral part of empowerment (Wegs et al., 2016). Having controlling husbands has been associated with an unmet need for FP (Meiksin et al., 2015). Women who are empowered to make decisions concerning FP use are more likely to utilize contraceptives (Belay et al., 2016). Dependency on husbands and other family members, such as the mothers-in-law and limited decision-making autonomy, negatively influences services' uptake (Shahabuddin et al., 2019). Various factors (sociodemographic characteristics) such as women's educational and employment status, occupation, and partner's educational status are associated with women empowerment for FP's decision making power. Employed women and those with higher education status are more likely to have higher decision-making power concerning their fertility, either individually or together with their partners, than the unemployed and those with less education (Belay et al., 2016). Women who can communicate with their partners on FP and those with control over earnings are more likely to use contraception (Wegs et al., 2016). Most of these studies exploring the individual factors, as noted, are qualitative, have been done in other countries, or have covered a small geographical area in Kenya, mainly focusing on the general population. This study used nationally representative data to focus on adolescents and postpartum women. The KDHS has data on why women do not use contraceptives and sociodemographic characteristics. This

study described the sociodemographic characteristics of adolescents and postpartum women and determined the association to FP use.

Interpersonal Factors

The SEM's interpersonal level focuses on the individual interaction with the primary groups, including family, friends, and peers who are part of society and influence their decision-making (National Institute of Health, 2005). These interactions provide social support, identity, and role definition, which in turn influence behavior. On decision making for FP, studies have shown that many women depend on their partners' approval to use FP. In a study among the fishing communities in Uganda, Nanvubya et al. (2015) found that women depended on their husbands' approval to use FP. Harrington et al. (2016), in a qualitative study in Western Kenya, found that gender roles were involved with many men viewing FP as the responsibility of the women since they carry the pregnancy and take care of the children. However, the ultimate decision making still rested with the men despite their little interest in the subject. Even when men want to use contraception, they tend to rely on women. Ochako et al. (2015) did a secondary analysis of the KDHS to document contraception determinants among sexually active men in Kenya. This analysis revealed that men mainly rely on their partners for contraception use. Factors found to influence their contraception use included; the area of residence, marital status, religion, wealth, health care provider interaction, fertility preference, number of sexual partners, and access to media (Ochako et al., 2015).

Nevertheless, in most cases, for women to use contraception, they need the partners' approval. In a study in Ethiopia, Jalu (et al., 2016) found male dominance in decision making, particularly the husband's influence, as barriers to FP use.

Withers et al. (2015) did a qualitative study in the Kenyan Nyanza region. They found that as gender roles and relations change, some men are reluctant to support FP. They fear that FP enhances female sexual agency and promiscuity and further weakens the male's power and role in society (Withers et al., 2015). On the one hand, some husbands perceive FP as a woman business and do not consider it their business. On the other hand, as a study in Nigeria revealed, some husbands fear that women who use FP may become promiscuous, which negatively affects the FP demand (Adanikin, McGrath, & McGrath, 2017).

Approval of contraception by the partner and discussion of FP within the couple increases the likelihood of uptake of FP (Ajong et al., 2016; Prata et al., 2016). Communication with a partner about FP positively influenced FP's uptake (Prata et al., 2016). There is a significant and positive association of the utilization of postpartum FP services husband's approval of contraception (Bwazi et al., 2014). However, some religious beliefs discourage couples from discussing and deciding the number of children they would want to have (Jalu et al., 2019). They consider getting children as from God, and hence there should be no interference.

Besides the partners, friends influence the use of FP. Women may be more comfortable sharing their contraceptive issues with friends and trusted women rather than health workers. Depending on their knowledge and perceptions of FP, the friends may discourage FP's use, as documented in a qualitative study in Mozambique (Capurchande et al., 2017).

The majority of these studies are qualitative and therefore documented concepts of the interpersonal level factors influencing FP uptake that need testing in quantitative studies. The quantitative studies were done either in other countries or in a small geographical area in Kenya, focusing on adolescents and postpartum women. It is, therefore, vital to get nationally specific data for the priority groups in Kenya. This study has provided evidence-based on quantitative data that is representative nationally. Therefore, the evidence from this study will be more reliable to support national FP programming than that from either qualitative studies or from studies that covered a limited geographical space.

Community Factors

According to the SEM community, factors including the social networks, norms, or standards, which exist either as formal or informal, among individuals, groups, and organizations influence behavior (National Institute of Health, 2005). Community factors such as disapproval of FP use by the community members may discourage women from using contraception (Wegs et al., 2016). Withers et al. explored men's perspectives of gender roles and cultural norms about FP use. They found that misconceptions on the side effects hinder men from supporting FP's use by their partners (2015).

In a study done in Kenyan and Nigerian cities, many misconceptions at the community level associated contraception with woman's potential ill health and loss of fertility, and they negatively influenced the uptake of FP (Gueye et al., 2015). Withers et al. 2015 found that even men who expressed their support for FP in their study spent more time discussing FP's negative aspects rather than the positive effects. Thus it is possible for men to verbally express support but not necessarily have enough confidence in contraception to support their spouses. A qualitative study in Togo suggested that sharing information with men on FP benefits such as financial gains and dispelling myths on the side effects could positively influence contraception support (Koffi et al., 2018). Withers et al. 2015, found that FP dialogues at the community level to address the common myths and misconceptions and the adverse effects of the gender roles imbalance may positively shift norms to support the use of contraception in a community (Withers et al., 2015). An intervention in Papua New Guinea showed that by engaging the community's gatekeepers and reaching the members, particularly the men, with information on the benefits of birth spacing, the values and norms might transform to prioritize FP (David & Allan, 2018). In engaging the community, it is critical to consider their values and beliefs. For example, where they value children, highlighting FP's health benefits to the mothers and their children enhances positive attitudes towards contraception.

Silumbwe et al. (2018) conducted a qualitative study that explored the factors that facilitated and those that hindered FP services uptake at community and health systems levels. The community-level factors that influenced FP uptake negatively included experience with side effects, rumors, myths, misconceptions, community stigma, and negative traditional and religious beliefs. However, community characteristics such as functional structures, desire to delay pregnancy, and knowledge on contraceptives supported FP use.

Mutumba et al. 2018, in a multicounty analysis of DHSs, found that the social context, including socio-cultural and gender community, norms significantly shape decision making on FP. Communities with a higher average age at first marriage, those with higher education where women have greater autonomy of household decision making, and wealthier communities had higher use of modern contraceptives (Mutumba et al., 2018). Jalu et al. 2019, in a qualitative study in Ethiopia, found that pressure from social norms and expectations continue to influence the desired family size, with members preferring larger family sizes to conform. In another qualitative study in Mozambique, Capurchande et al. 2017, found that traditional expectations of a large family, which a source of pride and a guarantee of future sustenance, encouraged high fertility (Capurchande et al., 2017). However, the changing economic times have caused some conflict among some members who feel many children are difficult to sustain.

Society's knowledge and understanding of FP influence their perception and use of FP. Those who report having heard of FP do not necessarily have adequate knowledge to support utilization. Information is understood through the social context, including gender roles. Where a community has functional structures, they have been used to positively reach the members with information to change their views on contraception positively, thus promoting the use of contraception (Amo-Adjei et al., 2017; Silumbwe et al., 2018).

In Capurchande's study, gender role perceptions influenced FP-related behavior (Capurchande et al., 2017). Contraception was widely a female's responsibility, with many men not attending counseling sessions despite being decision-makers. The females had more knowledge of FP compared to men. The men with more information tended to support the use of contraceptives by their partners. Unfortunately, men did not accompany their women to the counseling sessions. FP has not primarily been their business, and facilities have not had the infrastructure to accommodate them. When men attempt to accompany their women, they may experience teasing from their peers with other women stigmatizing them. Their involvement thus contradicts their gender roles. Thus men were not involved in FP issues, yet their perceptions were critical in FP uptake as decision-makers.

Speizer et al. (2018) using data from two cross-sectional data from four urban centers in Senegal, noted that when men were exposed to FP messages. For example, through mass media and community outreach activities, they are more likely to discuss FP with their partners and to support modern contraception use (Speizer et al., 2018). An individual living in a tightly neat community rural setting is more likely to be influenced by existing negative attitudes and perceptions of the community than a woman living a more solitary life in the urban setting. In a mixed-method approach, Wegs et al. found that community perceptions influence FP uptake (2016). Community discussions on FP facilitated the shift of norms to make FP more acceptable in a community.

FP is generally looked at as for the married. In southwest Nigeria, a mixed-methods study by Sieverding et al. (2018) revealed that unmarried adolescents face social stigma due to the community's view of sexuality. They faced discrimination at the service level due to provider bias. Many health workers were reluctant to provide unmarried adolescents with longer-acting methods, and some dissuade the adolescents from using FP altogether. These are community norms that influence the provision of services at the organizational level since many health providers are members of the community and share their norms and beliefs.

Though the above studies provide some information on the community-level factors that influence FP uptake, many are qualitative; hence there is a need for quantitative studies for more robust evidence. Most of the studies are over small geographical areas and mainly outside Kenya. A nationally representative quantitative study is therefore critical to establish the status in Kenya. This study has provided nationally representative information on community factors associated with FP uptake.

Organizational Factors

Though personal and community factors are critical in utilizing FP, women may fail to use the service due to various organizational factors such as access and availability of the services (Prata et al., 2016). In a qualitative study, Jalu et al. found that one's residence determines services' utilization (Jalu et al., 2019). Challenges include physical inaccessibility. The rural setting services tend to be far in many rural areas and inconveniently located with low and costly transport compared to the urban setting (David & Allan, 2018; Silumbwe et al., 2018). In some cases, the facilities exist, but the commodities and supplies to support service provision are inadequate, and the opening hours not flexible to suit the needs of different clients (Benson et al., 2017). Silumbwe et al., 2018, found that long physical distances to the facilities, stock out of the method of choice, and poor provider attitudes contributed to low utilization.

Besides geographical access, financial costs can be a barrier, particularly for long-term and permanent methods. Where programs have been implemented to provide financial support for FP methods, the uptake of these methods increased significantly compared to areas with no support (Oyugi et al., 2017).

The quality of services influences the uptake of FP services, as noted by Woog et al., in a secondary analysis of national quantitative surveys from 70 developing countries (Woog et al., 2015). Health workers' ability to communicate with clients may influence the FP understanding and use by the clients. Health workers should be able to offer culturally relevant counseling. Their ability to serve the different categories of clients (adolescents, postpartum mothers, and other women) appropriately is also critical. In a qualitative study, realities such as the challenging economic times and the effects of large families on the environment when well-articulated influenced men's fertility desires (Kock & Prost, 2017). Balanced discussions on contraception are therefore critical in encouraging FP use. When health workers emphasize the need for a health service and offer supportive follow-up, they are encouraged to seek services. A program in Embu that entailed close postpartum follow-up led to an increase of FP uptake from 6% to 56%, thus demonstrating the importance of follow-up (Warren et al., 2010). Bwazi et al., in a hospital in Malawi, found a significant and positive association of utilization of postpartum FP services with the provision of clear FP information (2014).

In some studies, in different parts of Africa, clients admitted having limited discussions with the health workers and their spouses (Ajong et al., 2016; Prata et al., 2016). Some clients felt that despite spending much time waiting to see the health workers, they had limited interaction with them, and they were not able to ask many questions. Thus the quality of counseling may influence the knowledge levels and adequacy for clients to make decisions. Therefore, myths and misconceptions about FP continue despite interactions with health workers.

When women find contraception challenging to obtain, they are unlikely to use it (Keogh et al., 2015). Integration of contraceptive services, provision of couples counseling, and availability of skilled health care workers to provide a wide range of methods contribute positively to the uptake of services (Amo-Adjei et al., 2017; Silumbwe et al., 2018). Jalang'o et al. 2017 reported that ready access to contraceptives at a health facility and favorable perception of the services encourages FP uptake (Jalang'o et al., 2017). The approach to offering FP services can influence the uptake of particular methods, affecting the method mix. Social franchising in Kenya increased the likelihood of using LAPM, which is considered more cost-effective (Chakraborty et al., 2016). Focused programs that combine different approaches such as dissemination of information to the community and improved availability and accessibility of different methods seem to increase the overall uptake of FP and the method mix (Benson et al., 2017).

Though these studies provide useful insights on FP uptake issues across many developing countries, mainly in Africa, only a few are specific to Kenya. However, even those done in Kenya are not nationally representative and do not focus on adolescents and postpartum women. Hence the need for more a focused study; this study focused on determining the association between organizational factors and FP uptake in Kenya.

Covariates

Covariates are those factors that are an individual’s characteristics that are not captured in the research questions as either dependent or independent variables but may have an influence on the outcome of interest. Independent variables in this study are the

various influence levels in SEM. Socio-demographic factors may influence FP uptake through independent variables, hence the need to measure their potential contribution. For example, the level of education may influence FP's uptake because an educated woman can understand the FP messages more than a non-educated one. A higher economic status may mean that the woman can afford the contraceptives. Various socio-demographic characteristics have varying influences on FP uptake. Ochako et al. 2017, found the area of residence, marital status, religion, and wealth status to influence contraception use (Ochako et al., 2017). Jalang'o et al. 2017, found younger age, being married, higher education level, and being employed as being associated with FP uptake (Jalang'o et al., 2017). However, in some studies, older age rather than younger was found to positively influence FP uptake (Mutumba et al., 2018). The realization that age is a critical factor in FP uptake has led to the need to look at age-specific factors to unveil specific needs, particularly for the youth (Prata et al., 2016). Johnson, 2017 analyzed Nigeria's 2013 DHS and found socio-demographic characteristics such as education, age, and residency area to influence the uptake of contraception (Johnson, 2017). Once adjustment for other factors (such as education and wealth), there was little disparity in FP uptake between the rural and urban areas of residence. However, in other studies, one's residence has been noted to be a significant determinant of access for FP (Oyugi et al., 2017). The residence affects the access to the FP services, with those living in the rural setting having less access due to various factors (Jalu et al., 2019). For example, services tend to be far in many rural areas compared to urban settings. Besides, those in

the urban area are likely to have more exposure to information, including mass media and the internet (Jalu et al., 2019)

Education level and marital status were positively associated with current modern contraceptive use among women aged 15–24 (Prata et al., 2016). Less-educated women are less likely to use FP (Asaarik, & Adongo, 2015; Prata et al., 2016). In another study, Mutumba et al., 2018 found that higher education, wealthier status, urban residence, and exposure to mass media positively influenced FP uptake (Mutumba et al., 2018). Even among postpartum women, the level of education has a significant and positive association with the utilization of postpartum FP services (Bwazi et al., 2014).

However, some studies have shown mixed results as far as the association of socio-demographic characteristics with FP uptake is concerned. Ajong et al., 2016, found some degree of association though statistically insignificant between the unmet need for FP and level of education, religion, and number of years of cohabitation. According to Prata et al. (2016) young people tended to have more knowledge of condoms than other methods and thus was the preferred method.

The discussed studies provide critical insights on the covariates that may be associated with FP uptake. They demonstrate that it is crucial to study the covariates to establish if they are confounders to the independent variables of interest. However, these studies are not specific to Kenya, and some are qualitative, hence not suitable for inference. This study will provide information that is specific to Kenya. Establishing the association between the covariates with FP uptake will provide valuable evidence on addressing the FP needs of the different groups in the Kenyan population.

Utilization of care, particularly maternal and child health services such as delivery, ANC, PNC, and immunizations for the infant, may be related to personal characteristics such as socioeconomic status, attitudes, and perceptions. They could also be related to organizational factors such as availability and quality of services. They have been discussed together with organizational factors due to their close association. However, they will be considered covariates, and strictly speaking, they do not fit in either the organizational level or the intrapersonal level in the SEM.

Definitions

Family Planning

Family planning is the term used to refer to the preparation, knowledge, and methods that assist people to plan and attain their desired family size and to determine the spacing of pregnancy (WHO, 2018). It involves making decisions. Therefore, FP services include the provision of counseling to vail the necessary information to make informed choices. Though the term FP often refers to pregnancy prevention, strictly speaking, it does include fertility treatment to enhance conception. In this paper, the term FP refers to pregnancy prevention. Some methods of FP are modern, while others are traditional.

Contrac**eptives**

Contraceptives are the methods used to prevent pregnancy for achieving the desired family size and spacing (WHO, 2018). Thus contraceptives are used to assist individuals and coupes to implement their FP decisions. This relationship may explain why the terms contraception and FP are used interchangeably in many write-ups. The majority of the available contraceptive methods are for women, with men having a

limited choice of modern methods, mainly limited to male condoms and sterilization (vasectomy) (WHO, 2018). The limited availability of FP methods for men may explain why most of the FP discussion refers to women.

Modern Methods of Family Planning

The definition of modern methods has varied across organizations; in most cases, organizations list the methods without a clear criterion (Hubacher & Trussell, 2015). The hormonal methods and devices, such as the intrauterine contraceptive device (IUCD) used to control fertility, seem universally accepted as modern methods. However, methods based on fertility awareness have raised controversy. World health organization has listed fertility awareness methods such as the sympto-thermal method, two-day method, basal body temperature method, standard days method, and the LAM as modern methods. In contrast, it has classified the calendar method or rhythm method and withdrawal (coitus interruptus) as traditional methods (WHO, 2018). Hubacher and Trussell, 2015 propose a definition of modern methods as a product or medical procedure that interferes with reproduction from acts of sexual intercourse (Hubacher & Trussell, 2015). With this definition, a method such as LAM does not qualify as a modern method. This study considered the following methods as modern methods; the combined pill, the mini-pill, the IUD, injectables, condoms, female sterilization, male sterilization, implants, lactational amenorrhea, and female condom as classified by the DHS program (2019).definition of modern methods has varied across organizations; in most cases, organizations list the methods without a clear criterion (Hubacher & Trussell, 2015). The hormonal methods and devices, such as the intrauterine contraceptive device (IUCD)

used to control fertility, seem universally accepted as modern methods. However, methods that based on fertility awareness have raised controversy. World health organization has listed fertility awareness methods such as the sympto-thermal method, two day method, basal body temperature method, and standard days method as well as the LAM as modern methods. In contrast, it has classified the calendar method or rhythm method and withdrawal (coitus interruptus) as traditional methods (WHO, 2018). Hubacher and Trussell, 2015 propose a definition of modern methods as a product or medical procedure that interferes with reproduction from acts of sexual intercourse (Hubacher & Trussell, 2015). With this definition, a method such as LAM does not qualify as a modern method. In this study, the following methods are considered as modern methods; the combined pill, the mini pill, the IUD, injectables, condoms, female sterilization, male sterilization, implants, lactational amenorrhea, and female condom as classified by the DHS program (2019).

Contraceptive Prevalence Rate

CPR is a critical indicator used to measure the access of FP in a population. International frameworks such as the millennium development goals use CPR, which measures married women's proportion on an FP method (United Nations, 2017). The restriction to married women or those in unions allows for comparable data across the countries (United Nations, 2017). Often CPR measures the modern methods used by married women, but CPR for other categories of women is calculated and specified as such. For example, CPR for all sexually active or CPR for all methods (including the

traditional ones) is determined. In this study, CPR for the various categories will be calculated and specified appropriately.

Unmet Need for Family Planning

Unmet need refers to the proportion of sexually active women of reproductive age who are capable of becoming pregnant, who want to limit (no more children) or to space (postpone pregnancy) their children, but are not using contraception (Kennedy et al., 2011). It has been used as a measure of FP programs' effectiveness and was the millennium development goals indicator 5.6 for monitoring target 5.B, which aimed at achieving universal access to reproductive health by 2015 (United Nations 2015).

Method Mix

Method mix refers to how the distribution of FP among users. It is a proxy indicator of the availability of different methods to the women and is therefore critical in supporting FP's informed choice (Bertrand et al., 2014).

Adolescents

Young people refer to the age group between 10 and 24 years, which is further divided into adolescents and youths; adolescents encompass ages 10 to 19, while 20 to 24 are young adults (Patton et al., 2016). Adolescence is further divided into early (10 to 14) and late (15 to 19). The DHS contains reproductive health data for women aged 15 and 49 years. This study considered adolescents between 15 and 19 years (DHS Program, 2019).

Postpartum Women and Postpartum Family Planning

The postpartum period and the postnatal period are closely related, and the two terms are often used interchangeably. However, strictly postpartum refers to the mother's issues, and postnatal refers to those concerning the baby (WHO, 2010). The postpartum period is the period soon after delivery up to six weeks after delivery. Hence, postpartum women are those within six weeks of delivery of a young one. However, for FP, up to one year is considered (WHO, 2013). Since this study focuses on FP, postpartum women will be considered as those within one year since the delivery of a young one, regardless of whether the young one is alive or not.

Assumptions

This study's primary assumption is that the sample is nationally representative, given the large sample size, the experience of the organizations conducting the study, and the high response rates with minimal missing data. This study has analyzed KDHS 2014 data, a population-based nationally representative survey conducted through the cooperation of many international organizations and Kenya's government (International Household Survey Network, 2019). Its overall objective was to evaluate and monitor the health of the Kenyan population. Some of the specific objectives included estimating the fertility and measure changes in fertility and contraceptive prevalence. The KNBS was the leading implementing organization and thus led to the survey's planning and the analysis and dissemination of the survey results. The KNBS, supported by other organizations, was responsible for the survey's operations and received technical assistance from the ICF International staff (Kenya National Bureau of Statistics, 2015).

The questions' response rate was high; of the selected demographic and health questions, the average missing response was less than 1%, and missing anthropometry information for children was 2.41%. That of women was 5.61%. These proportions indicate high data validity given the high response rate.

Scope and Delimitations

The study participants were women aged 15 to 49 years found in the pre-selected households; the total number of women age 10 to 54 who had slept in the households that were visited the night before the interview was 32,247. Women younger than 15 years and those older than 49 were excluded. There was a high response rate of 96.1%. This high response rate may be attributed to the quality training that the interviewers had received and the mass publicity the survey received in the country.

This study analyzed adolescents and postpartum women. The analysis will provide information that is specific to these priority groups in Kenya. The KHDS was not per any theory. However, the secondary analysis used SEM.

Significance, Summary, and Conclusions

FP is a well-known public health intervention that reduces the unmet need for limiting and spacing pregnancies. Reducing the unmet need for FP has been highlighted as one of the cost-effective public health strategies in low and middle-income countries with significant benefits for both mothers and infants, reduces demand for abortion as well as vertical transmission of HIV (Zakiyah et al., 2016). For contraception to significantly reduce maternal mortality, it must reach the most at risk and those with an unmet need (Ganatra & Faundes, 2016). A literature review has shown that adolescents

and postpartum women are priority groups due to their high unmet need for FP and the high risk of poor pregnancy outcomes they carry. It takes political (organizational factors) as well as socio-cultural (individual and community/societal factors) decisions to have contraception used or not used (Stiegler & Susuman, 2016). A unique challenge is associated with reaching postpartum women and adolescents, resulting in marked disparities and inequities within these groups (Dennis et al., 2017; Sonalkar et al., 2013; Vogel et al., 2015). Besides the health benefits of FP, there are related development gains. Various international and national targets for health and development, including the sustainable development goals, have been set. To achieve these targets by 2030, the majority of countries, including Kenya, need to accelerate the uptake of FP (Choi et al., 2015). Evidence is needed to support favorable decisions to support FP uptake at all levels. Though there are many studies internationally, regionally, and nationally, there lacks nationally representative data in Kenya for adolescents and postpartum women despite their high unmet need for FP. Many studies have not examined the factors contributing to FP use holistically by considering all SEM levels. This study will bridge this gap and provide information that will support better programming for the adolescents and the postpartum women, to enhance their FP uptake.

Increased use of FP can improve the health of women and their children and empower adolescent girls to avoid unintended pregnancy, thus improving their opportunity to pursue education. Education will enhance the girls' chance of being economically independent. Improved health and economic status will, in turn, enhance

the general quality of life (Canning & Schultz, 2012). Additionally, fertility decline reduces youth dependency, further strengthening economic growth.

Increased uptake of FP can prevent unintended pregnancies and all their consequences, thus saving millions of dollars that are made available for other social services and economic development, thus improving the general quality of life for all, not just women (Canning & Schultz, 2012). These gains are very significant positive social changes in society.

KDHS secondary analysis tested the significance of various factors and determined their association with FP uptake for adolescents and postpartum women. The KDHS is a nationally representative survey done using international standards to ensure quality information is collected. The sampling frame used is from the country's census, following international standards to ensure its internal and external validity. The analysis in this study followed statistically sound methods to ensure quality information. The reporting is relevant to the Kenyan context.

Section 2: Research Design and Data Collection

Introduction

This study examined the factors that contribute to FP uptake among priority groups (adolescents and postpartum women) in Kenya. The primary dependent variable was the uptake of FP, and various independent factors were analyzed. The uptake of FP has been expressed as the proportion of adolescents or postpartum women who reported to have been using a modern method of FP during the survey. The independent variables included the intrapersonal, interpersonal, community, and organizational factors. Sociodemographic characteristics and characteristics on utilization of services were considered as covariates. Analysis was done to establish their association with FP uptake among adolescents and postpartum women and how they differ by regions. Data from the KDHS were used. The results of this study will provide important information on improving FP programming for adolescents and postpartum women in Kenya. The results of this study will also provide feedback that can inform subsequent KDHS questions in the future. It will provide a baseline for comparison on the factors associated with FP among adolescents and postpartum women for future KDHS data as well as future surveys on the status of factors influencing FP uptake across the regions for postpartum women and adolescents.

Research Design and Rationale

Study Variables

This quantitative study sought to establish the factors that are associated with the uptake of FP among adolescents and postpartum women. The dependent variable was FP

uptake, which was measured by the current use of FP. From the data, the proportion of adolescents and postpartum women of modern methods of FP was determined. The independent variables were the various factors that influence FP uptake, which were organized according to the different SEM levels. The intrapersonal factors included knowledge on FP and exposure to different sources of FP information. Perceptions on FP were extrapolated from reasons given for not using FP. Interpersonal variables included partner and other family involvement in decision-making as well as influence from friends. Community-level variables included mean age at marriage, mean age at first birth, and mean age of sexual debut, household decision-making norms, community perception on the ideal number of children, and community partner violence attitudes. At the organizational level, the variables included access to the services (distance and cost), counseling on FP, availability, and utilization of maternal and child health services such as ANC, delivery, postnatal care and immunizations. Covariates included sociodemographic characteristics such as education level and wealth status and use of maternal and child health services (seeking care during pregnancy, delivery, and postpartum period, and immunizations for the infant).

Research Design

This study was a quantitative, correlational research utilizing a cross-sectional survey design. Its aim was to answer the question regarding the factors that are associated with FP uptake (use) by adolescents and postpartum women. Secondary analysis of the KDHS has provided information on the different factors that influence the uptake of FP in Kenya. The chi-square of association was used to determine which factors significantly

influence the uptake of FP. Logistic regression model was used to determine the contribution of various factors. The factors were grouped according to the SEM levels. Models were created for adolescents and for the postpartum mothers.

The DHS is a massive data set that required time and sufficient knowledge and expertise in statistics as well as FP. It was critical to identify the relevant questions that answer the research questions from the different sections of the survey. Understanding the way the questions were asked and the coding of each variable was required to ensure proper interpretation for validity. Recoding was necessary for the analysis to answer particular specific research questions. No payments were required to obtain the data.

FP access is used as a proxy indicator of access to reproductive health services. FP access is a priority that was in the millennium development goals and is now in the sustainable development goals, and CPR is used as the indicator (United Nations, 2017). Despite much progress made in women getting FP and other maternal health services, there is a need to go beyond the traditional programming for universal access to be realized (Kissoon et al., 2015). One area of concern is inequity across and within countries where some geographical areas or some segments of the population are left behind (United Nations, 2017). FP programs need to be evidence-based to promote equitable access to all. The KDHS is done scientifically and provides nationally representative quantitative data on women of reproductive age and now covers all geographical areas. This study has been done according to the scientific standards, the data have provided specific information on adolescents and postpartum women, thus filling critical gaps on these priority groups.

Methodology

Population

The KDHS 2014 collected information from women aged 15–49 years and from men aged 15–54 years. According to the 2009 population census, women of reproductive age were 9,375,784 with 2,045,890 being 15 to 19 and 2,020,998 being 20 to 24 years of age (Kenya National Bureau of Statistics, n.d.). The number of households that were enumerated was 40,300 up from 9,936 households in the previous DHS (PopulationPyramid.net, n.d.).

The total population as per the latest census is 47,564,296, of which 23,548,056 were males, 24,014,716 were females, and 1,524 were intersex (Kenya National Bureau of Statistics, 2019). The population grew from 37.7 million in 2009 to 47.6 million in 2019. The population between 15-24 years was 19.61% of the population, and 34.27% were 25-54 years old (CIA World Factbook, 2019). From these data, the female adolescents and youths (15-24 years) were about 4,752,896. The KDHS 2014 interviewed 6,078 females who were 15 to 19 years old and 5,405 females 20 to 24 years of age (Kenya National Bureau of Statistics, 2015). Despite the increase in population, this is a sample size that will still be representative given the sampling design applied and the increased number of households compared to the previous surveys.

Sampling Strategy and Procedure

The KDHS utilized a multistage sampling strategy. First, clustering was done following geographical representative units, then probability random sampling within the clusters followed. Thus, samples were selected independently from each sampling

stratum. During the first stage, a total of 1,612 enumeration areas were selected with an equal probability of being selected from the sampling frame. For the second stage, the listed households within the clusters served as the sampling frame. From each cluster, 25 households were selected randomly.

There was an increase in the number of households from 9,936 in the previous 2008 KDHS to 40,300. The increase was due to the need to capture data at the county level, which are much smaller units, whereas previously the segregation was up to the provincial level (now considered as regions, in the 2014 KDHS). To ensure data quality, given this considerable increase, only priority indicators at the county level were collected; hence, there were full questionnaires and short questionnaires. The sample was divided into halves; one half received the full Household Questionnaire, the full Woman's Questionnaire, and Man's Questionnaire, and the other half received the short Household Questionnaire and the Short Woman's Questionnaire. In each cluster, one in every two households was selected for the full questionnaires, and the remaining households were selected for the short questionnaires. The short questionnaires were a subset of the long questionnaires. Data collected in both the long and short questionnaires can produce estimates at the national, rural/urban, and regional levels, but the data only in the long questionnaires is not suitable for making estimates at the county level.

Sampling Frame

The sample for the KDHS was drawn from the master sampling frame, the Fifth National Sample Survey, and Evaluation Programme. The frame contained a total of 5,360 clusters, which were divided into four equal subsamples. The clusters were drawn

using a stratified probability proportional to size sampling methodology based on the 2009 Kenya Population and Housing Census. For this survey, two subsamples of the frame that were developed in 2013 and updated in 2014 were used. Each of the 47 devolved units of administration called counties was stratified into urban and rural strata. Two of the counties, Nairobi and Mombasa, have only urban areas; hence, the total sampling strata was 92. The design aimed at producing nationally representative indicators at the national level for urban and rural areas separately, at the regional (former provinces) level, and for selected indicators at the county level. The sample had 40,300 households from 1,612 clusters spread across the country, with 995 clusters in rural areas and 617 in urban areas. In each sampling stratum, a two-stage sample design was used to select the samples independently. For the second stage of selection, the households from listing operations served as the sampling frame, and 25 households were selected from each cluster.

Sample Size

Many factors are considered in determining the sample size, such as the methodology and the effect size or the prevalence of the outcome of interest. Descriptive studies require a larger sample size compared to experimental studies, and a one-tailed hypothesis requires less sample compared to a two-tailed hypothesis. Simple random sampling requires fewer sample subjects compared to other designs. The outcome of interest is also an important consideration (Kaliyadan & Kulkarni, 2019). The KDHS was a descriptive cross-sectional study that had a two-sided hypothesis, utilized multistage sampling, and the many outcome variables were categorical.

Another consideration for the sample size was the need to have regional representation as per the administrative units. With the promulgation of a new constitution in 2010, the counties were much smaller units compared to the previously used provinces; hence, a bigger sample size was needed. The determination of a nationally representative sample was done with all these factors taken into consideration. The sample size for women age 15–49 years was 32,172, with 16,855 for the short questionnaires and 15,317 for the long questionnaires. The sample for men aged 15 to 54 years was 14,217 14. According to the KDHS report, 6,078 females who were 15 to 19 years old were interviewed (Kenya National Bureau of Statistics, 2015). Since the sample was nationally representative, it was used as such to retain generalizability. However, to be sure that the sample size for the subgroups of interest (adolescents and postpartum mothers) were within the minimum acceptable sample size, sample size calculation was done. The following formula was used (Suresh & Chandrashekara, 2012):

$$N = \frac{Z^2_{\alpha/2} * P * (1-p) * D}{E^2}$$

N= 1.96 x 0.532 x (1- 0.532) x 1.503/ 0.0532^2 = 1.96x 0.532 x 0.468 x 1.503/ 0.00283=0.73345/0.00283 = 259.16 = 260

N is the sample size. P is the prevalence or proportion of event of interest for the study. According to the 2014 DHS the proportion of currently married women of reproductive age using a modern method is 53.2%. E is the Precision (or margin of error); generally, E is 10% of P. Zα/2 is normal deviate for two-tailed alternative hypothesis at a level of significance; for 5% level of significance, Zα/2 is 1.96. D is the design effect,

which reflects the sampling design; for cluster random sampling is taken as 1.5 to 2. The design effect for the 2014 KDHS, for women currently using a modern method is given as 1.503.

Procedure

The self-reported questionnaire targeted women of reproductive age, 15–49 years of age, and men aged 15–54 years. The interviewers visited only the preselected households for data collection. Information was collected for individuals who had slept in the household the night before the survey. The Household Questionnaires and the Woman's Questionnaires were administered in all households, but the Man's Questionnaire was administered in every second household. The resulting data were weighted to be representative at the national, regional, and county levels.

Identification of participants eligible for individual interviews was done using information from the household questionnaire. The household questionnaire was used to list all the members of the household who regularly stayed there and visitors who stayed in the household the night before the survey. The questionnaire collected personal details such as the sociodemographic characteristics and the relationship to the head of the household. Household characteristics such as the source of water, type of toilet facilities, materials used for the floor and roof of the house, and ownership of various durable goods were collected. The data were collected face to face.

After the eligible men and women in the household were identified, the relevant questionnaire was administered. Men aged 15–54 years living in every second household in the sample were interviewed using the Man's Questionnaire. The Man's Questionnaire

collected information similar to that contained in the Woman's Questionnaire. However, it was shorter because it did not contain questions on maternal and child health, nutrition, mortality, female circumcision or fistula. These excluded questions are not of interest in answering the research questions for this study.

The questionnaires were prepared in English. After finalization they were translated into 16 local languages. The translated questionnaires were pretested to detect any possible to ensure proper flow as well as to gauge the length of time required for interviews.

Gaining Access to the Data Set

The KDHS data are available online on the DHS website. The requirement is to register as a user of the website and then request for the data. The information required is the purpose of the data, the name of the project, and the specification of the particular survey data requested. The requesting person agrees to abide by several conditions, including maintaining the confidentiality and only use the data for the purpose stated in the request. The request is then processed, and feedback is received via email within 48 hours. The permission is granted via email with an attached letter authorizing one to download. This process was done for this study. There were no charges; the data are free to access.

Instrumentation and Operationalization of Constructs

The 2014 KDHS questionnaires were developed on the bases of the previous survey questionnaires. The DHSs are nationally representative population-based household studies conducted in many countries, including Kenya (International

Household Survey Network, 2019). They have been conducted since 1984, primarily funded by the primarily by the U.S. Agency for International Development and individual countries receive technical support from the DHS program. In Kenya, previous DHSs were done in 1989, 1993, 1998, 2003, and 2008–2009 (International Household Survey Network, 2019).

For this survey, the questionnaires were developed through consultation of many stakeholders; a two-day workshop was held. Desk reviews were done to ensure that the country's needs were being met. This included considering the objectives of the relevant population and health policies and programs. The objectives of a new population and national development policy released by the government in 2012 were considered. Such objectives included reducing population growth rate to be in tandem with economic growth and social development goals envisioned in the Kenyan Vision 2030, fertility and mortality rates reduction, provision of equitable and affordable quality reproductive health services, including FP among other objectives. The 2010 Kenya constitution devolved the health function to the county governments, with distinct functions being assigned to the national and county governments. The Kenya Health Policy 2014–2030 objectives and principles, which include equity in the distribution of health services and interventions, were considered in the development of the instrument. Hence, there was the need to have data that could be segregated to the county levels unlike in the past.

Priority indicators were selected based on policies and programs' objectives and with the input of the stakeholders. Questionnaires were developed for the household, for the individual woman, and individual man. The household questionnaire had information

on identification, usual members and visitors in the selected households, background information on each person listed, such as relationship to head of the household, age, sex, marital status, survivorship and residence of biological parents, and highest educational attainment. It also had characteristics of the household's dwelling unit, such as water source, type of toilet facilities, materials used for the floor, roof, and house walls. The ownership of various durable goods (these items are proxy indicators of the household's socioeconomic status) was also included. The individual woman questionnaires collected information on background characteristics (education, marital status, media exposure), reproductive history, FP knowledge and practices, sexual activity, husbands' background characteristics, awareness, and behavior regarding HIV and other sexually transmitted infections. The individual man questionnaires had information on the respondent's background characteristics, reproduction, contraception, marriage, sexual activity, fertility preferences, employment and gender roles, HIV/AIDS, and other health issues.

Reliability and Validity of the Study Instrument

Reliability refers to the consistency and stability of measurements, while validity has to do with measuring what is intended. Care has been taken over the years by the DHS program to ensure that the survey questionnaires are reliable and valid in their measurements.

The KDHS used self-reported questionnaires, targeted women of reproductive age, 15–49 years of age, and men aged 15–64, living in the sampled households, and collected a wide range of health questions, including fertility, FP, maternal and child

health among others. The questionnaires included sociodemographic factors such as education level, wealth status, access to various amenities such as water, and residential areas. Reproductive health data include knowledge on FP methods, altitude, practice, and service utilization, including related factors. The man's questionnaire had questions similar to the woman's but did not include the maternal and child health, nutrition, adult and maternal mortality, or female circumcision or fistula experience.

Data quality in a survey can be affected by either sampling or non-sampling errors. The survey methods, the respondents, and the instruments or measurements can introduce measurement error (Boo & Froelicher, 2013). It is challenging to evaluate non-sampling errors statistically. Multistage sampling was done to minimize sampling errors to ensure the data was nationally representative, as detailed in the sampling section. Sampling errors can be computed statistically. For the DHS, sampling errors are computed in either Integrated System for Survey Analysis or Statistical Analysis System, using ICF Macro programs (Kenya National Bureau of Statistics, 2015). The Taylor linearization method of variance estimation for survey estimates was used for means, proportions, or ratios. Simultaneously, the Jackknife repeated replication method was used for variance estimation of complex statistics such as fertility and mortality rates.

To ensure non-sampling errors were minimized, stringent measures were taken, including training all personnel involved in data collection and processing and strict data cleaning procedures.

One week-long training was conducted to ensure that the interviewers understood the study instruments and used them as intended for validity. The training focused on the

survey design concepts and the content of the questionnaires. Adult teaching techniques were used. The trainers continued to support the process; they led the pre-test exercise and served as coordinators during data collection. After the training pre-test of the questionnaires, including the translated ones, was done. Pre-testing was done but within the clusters not included in the survey data collection. The lessons learned from the exercise were used to improve the questions and enhance the logistics of the data collection. For quality data collection, several personnel categories were recruited and trained thoroughly to ensure a full understanding of the study design, the questionnaires, and the logistics involved in data collection. These personnel included 48 supervisors, 48 field editors, 144 female interviewers, 48 male interviewers, 28 quality assurance personnel, and 20 reserves.

Completed questionnaires were sent to the Data Processing Centre in Nairobi. Here, cluster and household numbers were verified to ensure that they were consistent with the sampled list and that each cluster had questionnaires for 25 households. Training for data entry was done before starting the entry. For verification, all data were double entered using the CSPro software. As entry is done, secondary editing, including further data cleaning and validation, was done simultaneously.

Low response rates and missing data can reduce the sample size and hence reduce the validity. The selected sample consisted of 39,679 households, and 36,812 were found occupied at the time of the data collection, and a total of 36,430 were successfully interviewed. Thus, an overall household response rate of 99percent. The majority of the households that were not interviewed were due to structures found vacant or destroyed,

and others where occupants were absent for a long time. A total of 31,079 women age 15 – 49 were interviewed out of 32,172 of the eligible women giving a response rate of 97%. 14,741women out of the eligible 15,317were interviewed using the long questionnaire giving a response rate of 96%. 12,819 men out of 14,217 eligible men were interviewed, giving a response rate of 90%. For the short questionnaires, 16,338 women out of 16,855 eligible women were interviewed, translating into a 97% response rate. The response rate was lower in urban areas, particularly for men, due to failure to find them at home despite several visits. Missing data on variables of interest can affect the data quality and validity of the results. In this survey, great care was taken to ensure minimal missing data.

The questions have been studied carefully to understand what they measured and the scale to ensure that the questionnaires sufficiently answer the research questions. The data codebook has also been studied to ensure that the variables can be analyzed to answer the intended questions.

Operationalization of Variables

When conducting secondary analysis, it is critical to ensure that data are operationalized and coded appropriately to allow for the intended analysis. The database evaluation was done by reviewing the survey's purpose and reports and examining the manual's codebooks and operations manual. One of the main objective s of the KDHS was to collect FP information, including determining the fertility rates and some factors related to FP utilization.

Data Analysis Plan

SPSS (v. 24) was used for analysis to answer the research questions.

Research Question 1: To what extent are intrapersonal, interpersonal, community, and organizational factors (independent variables) associated with the uptake of family planning (dependent variables) among adolescents in Kenya?

$H_0$1: Intrapersonal, interpersonal, community, and organizational factors are not associated with the uptake of family planning among adolescents in Kenya.

H_a1: Intrapersonal, interpersonal, community, and organizational factors are associated with the uptake of family planning among adolescents in Kenya.

Research Question 2: To what extent are intrapersonal, interpersonal, community, and organizational factors (independent variables) associated with the uptake of family planning (dependent variables) among postpartum women in Kenya?

$H_0$2: Intrapersonal, interpersonal, community, and organizational factors are not associated with the uptake of family planning among postpartum women in Kenya.

H_a2: Intrapersonal, interpersonal, community, and organizational factors are associated with the uptake of family planning among postpartum women in Kenya.

Research Question 3: To what extent are the intrapersonal, interpersonal, community, and organizational factors (independent variables) associated with family planning uptake (dependent variables) among postpartum women and adolescents differ by counties in Kenya?

$H_0$3: Factors associated with family planning uptake among postpartum women and adolescents in Kenya do not differ by counties.

H_a3: Factors associated with family planning uptake among postpartum women and adolescents in Kenya differ by region.

Descriptive analysis was carried out first for the socio-demographic characteristics such as age, level of education, wealth status, use of FP, and the different factors of interest such as exposure to FP messages. Splitting into adolescents and older women was done, followed by splitting by regions for various variables. The chis square test of association was used to test which factors (variables) were significantly associated with FP use for adolescents and postpartum women. Logistic regression analysis was done to assess the contribution of different factors to the uptake of FP.

According to the SEM framework (intrapersonal, interpersonal, community, and organizational levels), the results have been reported for the different independent factors for the adolescents and postpartum mothers. For each significant variable, the odds ratios were examined to get the probability to use or not to use FP.

Interpretation of Results

The dependent variable is family planning uptake, which is measured by getting the proportion of adolescents and postpartum women who reported being on a method during the interview. The pattern of use, including those who have ever used and future intention to use a method, was described. The discontinuation pattern was described as well as the reasons for the discontinuation. FP use was related to the different independent variables and covariates, and the association reported among adolescents and postpartum women. The distribution of the different factors was analyzed and discussed in the report.

Threats to Validity

The respondents may want to give answers that are socially acceptable and may be affected by recall bias. The instrument needs to be reliable for accurate data. The wording and order of questions in the instrument and the timing of data collection can influence the responses' reliability and validity (Bierman & Bubolz, 2003). The questionnaires were pre-tested, and the interviewers trained well to minimize any errors.

Ethical Procedures

Secondary analyses of nationally representative surveys are cost-effective, raise few ethical issues, and are a fast way of doing nationally representative researcher (Boo & Froelicher, 2013). The DHS Program follows strict standards to protect respondents' and household members' privacy in all DHS surveys (DHS Program, 2019). The ICF Institutional Review Board (IRB) reviews the country's specific survey protocols, including the questionnaires, and gives ethical approval. Additionally, an IRB in the host country reviews and gives ethical review independently. ICF IRB ensures compliance with the U.S. Department of Health and Human Services regulations to protect human subjects (45 CFR 46). The host country IRB ascertains that the survey complies with the host's laws and norms country. Before each interview, an informed consent statement is read to the respondent, and they are allowed to accept or decline to participate. In Kenya, the survey materials are translated into various relevant languages to ensure the respondents understand. The statement outlines the interview/test's purpose, the expected duration of the interview, the interview procedures, any potential risks and benefits to the respondent, the contact information for more information about the interview, and

emphasizes the voluntary nature of participation. Privacy and confidentiality are strictly observed due to some questions' sensitive nature, such as those on sexual activity. After data processing, the identifiers are destroyed. The geographic coordinates of each survey are displaced at a random distance and in a random direction. Where testing such as for HIV or anemia is done, treatment and referral services are made available as appropriate. For data access, there are well laid down procedures and declarations to ensure the data's further ethical use. For this secondary analysis, the necessary approvals for the data's access have been made, and the Walden IRB approval was obtained before any analysis was done.

Summary

This study is a cross-sectional quantitative research that involved secondary analysis of the 2014 KDHS. It has determined the independent variables and covariates significantly associated with FP uptake among adolescents and postpartum women in Kenya. The logistic regression model was used to establish how different factors contribute to the uptake of the FP and by the adolescents and postpartum women. The independent variables were categorized according to the SEM levels of influence and association of different FP use factors described.

Results are organized into descriptive analyses of various characteristics and inferential statistics describing the relationship between the dependent and independent variables. The multi-variable analysis has reported the degree to which various variables contribute the uptake of FP. The findings are organized by research questions to answer the hypothesis associated with each research question.

Section 3: Presentation of the Results and Findings

Introduction

This study examined the factors that contribute to FP uptake among adolescents and postpartum women in Kenya. The analysis sought to answer three research questions and hypotheses related to the extent that intrapersonal, interpersonal, community, and organizational factors are associated with the uptake of FP among adolescents and postpartum women in Kenya as well as the differences across the regions. The primary dependent variable was the uptake of FP, and various independent factors were included. The independent variables were categorized according to the socioecological levels (intrapersonal, interpersonal, community, and organizational factors). Sociodemographic characteristics were considered as covariates. These characteristics are described and their association with FP uptake among adolescents and postpartum women including how their distribution by regions reported. Data from Kenya DHS 2014 were used. Based on the findings, recommendations to inform subsequent KDHS questions on FP in the future are made. The results provide a baseline for comparison on the factors associated with FP among adolescents and postpartum women and their distribution across the regions using future KDHS data.

Data Collection of Secondary Data Set

This study involved the secondary analysis of the KDHS 2014 data. It is a population-based survey that was conducted through the cooperation of many international organizations and the government of Kenya (International Household Survey Network, 2019). Its overall objective was to evaluate and monitor the health of

the Kenyan population. Some of the specific objectives included estimating the fertility and measure changes in fertility and contraceptive prevalence. The KNBS was the leading implementing organization in partnership with the Ministry of Health and thus led in the planning of the survey and the analysis and dissemination of the survey results. The KNBS was also supported by other organization and received technical assistance from the ICF International staff but was responsible for the operations of the survey (Kenya National Bureau of Statistics, 2015). The other organizations that partnered with the KNBS included the National AIDS Control Council, the National Council for Population and Development, and the Kenya Medical Research Institute). The survey was conducted from May 2014 to October 2014.

Sampling and Sample Characteristics

A multistage sampling strategy was used first clustering following geographical representative units, followed by probability random sampling within the clusters. Thus, samples were selected independently from each sampling stratum. During the first stage, a total of 1,612 enumeration areas were selected with an equal probability of being selected from the sampling frame. In the second stage, the listed households within the clusters served as the sampling frame with 25 households being selected randomly from each cluster. During data collection, the interviewers visited only the preselected households for data collection. Information was collected for individuals who had slept in the household the night before the survey. The self-reported questionnaire targeted women of reproductive age, 15–49 years of age, and men aged 15–54 years. The total number of eligible women was 32,172 out of whom 96.6% were interviewed, giving a

total of 31, 079. The response rate to the questions was high; the average missing response was less than 1%, and missing anthropometry information for children was 2.41% and 5.61% for women. These proportions indicate high data validity given the high response rate. This high response rate may be attributed to the quality training that the interviewers had received and the mass publicity the survey received in the country. For this study, the analysis focused on adolescents and postpartum women, and various factors were tested to determine if there was a statistically significant association with uptake of FP. The factors were organized into the various SEM levels.

Analysis

Discrepancies from Initial Plan

Though not in the initial analysis plan, analysis for adolescents included a comparison of their characteristics to those of older women rather than just focusing on the group itself. This approach was adopted to give more information on differences between the adolescents and the older women, which could point to inequities. Hence, the results provide critical information for the policy makers and program implementers to support the empowerment of adolescents.

Some factors such as the personal and community perceptions on FP (myths and misconceptions) were not evaluated because there were no suitable variables in the data set. To facilitate analysis, recoding was done for several variables. To get the sample for adolescents the categorical age variable was recoded with 15 to 19 years as adolescents and the rest as older women. For postpartum women, the variable “births in the past year” was used with those who had no birth within the past year being coded as other women

and those with a birth within the year being coded as the postpartum women. First bivariate analysis was done using the chi-square test to determine the factors that were significantly associated with FP uptake, both for the adolescents and for the postpartum women. The assumptions of the chi-square test were met in all the cases where the results are reported. Thus, variables used in the chi-square tests were all independent observations (mutually exclusive), frequencies, categorical measured as nominal, measured at one point in time, and no cell had an expected value of less than one. The factors were organized by the SEM levels.

To characterize the sample, various sociodemographic characteristics were analyzed including marital status, education level, literacy, area of residence and the wealth index. Characteristics related to utilization of services such as place of delivery and seeking various services are as a results of the interaction of the different factors in the SEM level. They were included as covariates to provide more insights about the study population and to test if they are associated with use of FP. Their results are reported with the rest of the results.

Additionally, for the sociodemographic characteristics, marital status was coded into those who had never been in a union, those currently in union, and those who were no longer in a union. The education achievement was coded into those who have primary school and below, those with secondary level, and those with aabove secondary. On the wealth index, the recoding was done into poor, middle, and rich. For literacy, the recoding was done to cannot read, able to read, and not applicable (where no cards were available or the visually impaired).

In order to test the association between use of modern methods and for inclusion in the binary logistic model, some characteristics were also recoded further. Level of education was recoded into primary level and below (incomplete secondary education and below) and those with secondary level and above. On wealth status the poorest and poorer were coded as poor and the middle, richer, and richest were coded as not poor. On literacy, those who could not read were one category, and those who could read parts of a sentence and those who could read whole sentences were classified as can read with those where no card for reading or the blind were classified as missing.

Some of the independent variables and covariates were also recoded. For the place of delivery those who delivered in any facility whether public or private were coded as having delivered in a facility while those who delivered either in their home or any other home were categorized as having delivered at home. For taking their infants for immunization the first DPT was used. Those who reported not to have taken them remained as *no*, those who reported to have taken them were all grouped as *having been taken*, and any other response such as *don't know* was considered missing. All those who reported to have attended ANC whether once or more were coded as having attended (yes), and those who reported not to have attended were coded as *no* and the rest as missing.

The dependent variable was the current use of FP. It was recoded to those using modern FP methods and those not using. Those who used pills, IUD, injectables, diaphragm, condom, male and female sterilization, implants, lactational amenorrhea, and foam were classified as using a modern method while the rest were classified as not using

a modern method. Binary logistic regression model was used to determine the contribution of various characteristics in the use of FP. The assumptions for binary logistic model were met; the dependent variable was categorical and dichotomous and nominal in nature, the independent variables were categorical and nominal, the observations were mutually exclusive, and any variable that had categories with cases less than 15 was not included in the model.

Results

Adolescents

To answer the first research question regarding the extent to which intrapersonal, interpersonal, community, and organizational factors are associated with the uptake of FP among adolescents in Kenya, first baseline sociodemographic and other descriptive characteristics of the adolescents were analyzed. Second, the bivariate analysis using chi-square test was done. Finally, the significant factors that met the assumptions of the logistic regression model was done.

Baseline Descriptive and Demographic Characteristics of the Adolescents

The total number of respondents among women of reproductive age was 31,079; out of these 6,078 (19.6%) were adolescents, and the postpartum women were 4,338 (14.0 %) with 495 being adolescents; thus, 8.2% of the adolescents were in the postpartum period.

The Rift valley region had the highest number of adolescents (27.9%) followed by Eastern at 107%. Nairobi region has the lowest with 2.1%. Most of the adolescents (85.8%) had never been in any marital union compared to only 13.4% of the older

women who had never been in a marital union. Eight hundred and sixty-four (864) of the adolescents reported to have been in union, and over 2,000 (36.7%) had had sexual encounters. More than half of the adolescents (68%) lived in the rural areas compared to 61.3% of the older women. More than half of the adolescents 57.6% had primary level education, and an even higher percentage of older women (65.2%) have a similar level. More adolescents (40.8%) had secondary level education compared to the older women (24.5%), but only 1.6% went beyond secondary school compared to 10.4% of the older women. The proportion of adolescents in the poor wealth quintile is higher than that of the older women, whereas the proportion of the older women in the rich wealth quintile are higher than that of the adolescents. A higher percentage of the adolescents (85.3%) were able to read compared to 69.8% of the older women. The sociodemographic characteristics of the adolescents and those of the older women are shown in Table 2.

The mean age at first birth for all the respondents was 19.42 years, with that of the adolescents being 16.43 years and that of the older women being 19.54 years. The mean age at first birth for the postpartum women was 19.42 years 19.37 and 19.44 years for the other women. Four-point five percent of the adolescents were pregnant during the survey time compared to 7.3% of the older women. The mean age of adolescents at first birth is 16.4 years, mean age at first sex is 14.5 years and mean age at first cohabitation is 16.1 years. The mean age of older women at first birth is 19.5 year mean age at first sex ix 15.4 years and their mean age at first cohabitation is 19.1 years.

Table 2

Sociodemographic Characteristics of the Respondents

Variable		Adolescents		Older women	
		Frequency	Percent	Frequency	Percent
Region		(*n* = 6078)			(*n* = 25001)
	Coast	807	13.3	3095	12.4
	North Eastern	358	5.9	1306	5.2
	Eastern	1032	17.0	4215	16.9
	Central	482	7.9	2632	10.5
	Rift Valley	1698	27.9	7361	29.4
	Western	676	11.1	2164	8.7
	Nyanza	900	14.8	3354	13.4
	Nairobi	125	2.1	874	3.5
Marital Status		*n* = 6078		*n* = 25001	
	Never in union	5214	85.8	3361	13.4
	In union	788	13	18248	73
	No longer in union	76	1.2	3392	13.5
Residence		*n* = 6078		*n* = 25001	
	Urban		32.0		38.7
	Rural		68.0		61.3
Educational attainment		*n* = 6078		*n* = 25001	
	Primary school and below		57.6		65.2
	Secondary		40.8		24.5
	Above secondary		1.6		10.4
Wealth Status		*n* = 6078		*n* = 25001	
	poor		46.6		41.6
	middle		21.5		18.6
	rich		31.9		39.9
Literacy		*n* = 6057		*n* = 24957	
	Cannot read		14.5		29.9
	Able to read		85.3		69.8
	Not applicable		0.1		0.3

On bivariate analysis, there was a statistically significant difference between the adolescents and older women for all the sociodemographic characteristics tested as follows: marital status, chi-square with 2 degrees of freedom equals 12814.6 *p* is less than .001; the areas of residence between the adolescents and older women is statistically significant; chi-square with 1 degrees of freedom equals 91.91 *p* is less than 00; chi-square with 2 degrees of freedom equals 952.680 *p* is less than 001; wealth status, chi-square with 2 degrees of freedom equals 132.2 p is less than 001; and for literacy, chi-square with 2 degrees of freedom equals 597.01 *p* is less than 001.

Family Planning Use Among Adolescents and Associated Characteristics

Only 7.8% of the adolescents were found to be using modern methods of FP compared to 42.2% of the older women. The mean age at first sex of adolescents using a modern method was 16.58 years, and those not using a modern method was 16.18 years. The most popular modern method among adolescents and older women was the injectable. Some methods such as sterilization and the lactational amenorrhea were not being used by adolescents. Table 3 shows the pattern of use, and Table 4 shows the current use by the specific method.

Table 3

The Pattern of Family Planning by the Adolescents and Older Women

	Adolescents	Older women
	Percent (*n* =6,078	Percent (*n* = 25,002
Currently using	8.6	46.0
Used since last birth	49.7	33.9
Used before last birth	1.3	5.3
Never used	40.5	14.7

On the intention to use, 63.2% of the adolescents reported that they intended to use some FP later compared to 49.9% of the older women. Twelve percent of the adolescents were not sure whether they would use in the future, and 24.2% did not intend to use FP in the future. The injectables were the preferred future method by most of the adolescents (50% of those on any method), followed by condoms (23.3% of users). Among the older women, 45.7% reported the injectable to be their preferred future method, followed by implants.

Table 4

Current Use of Family Planning by Adolescents and Older Women by Specific Method

Method	Adolescents		Older Women	
	Frequency	percent	Frequency	percent
Not using	5558	91.4	13489	54.0
Pill	24	.4	1415	5.7
IUD	2	.0	612	2.4
Injections	259	4.3	5257	21.0
Condom	124	2.0	662	2.6
Periodic abstinence	38	.6	775	3.1
Withdrawal	7	.1	136	.5
Other	1	.0	50	.2
Implants/Norplant	60	1.0	1909	7.6
Female condom	4	.1	7	.0
Other modern method	1	.0	14	.1
Female sterilization	0	0	652	2.6
Male sterilization	0	0	3	.0
Lactational amenorrhea (LAM)	0	0	20	.1
Total	6078	100.0	25001	100.0

Discontinuation of Family Planning Among Adolescents

Respondents were asked on the last method of FP they had discontinued within the last 5 years of the survey. Among the adolescents, 85.9% had discontinued a modern method with more than half discontinuing the injection and 22.2% discontinuing the pill. Table 5 shows discontinuation rates by method, and Table 6 shows the reasons for

discontinuation. The reasons for discontinuation were classified into two: those associated with the method (side effects, health concerns, need for a more effective method and inconvenience to use) and the rest. Among the adolescents, 22.7% had discontinued the use of FP due to method related reasons. The association between discontinuation of a modern method and method related reasons was not statistically significant; chi-square equals 1.60 with 1 *p* equals .206.

Table 5

Family Planning Methods Discontinuation by Adolescents and Older Women by Specific Method

	Adolescents	Older women
Method	Percentage *n* = 149	*n* = 4330
Pill	12.8	22.2
Injections	27.5	52.9
Condom	40.3	6.4
Periodic abstinence	12.1	7.7
Withdrawal	2.0	1.7
Norplant	4.0	5.4
IUD	-	2.2
Other modern method	1.3	0.3
0thers	-	1.2

Table 6

Reason for Discontinuation of Family Planning Methods Discontinuation by Adolescents and Older Women by Specific Method

Reason	Adolescents	Older Women
	Percent *n* = 132	Percent *n* = 4057
Became pregnant	9.8	6.5
Wanted to become pregnant	24.2	30.1
Husband disapproved	5.3	1.2
Side effects	15.2	30.4
Access, availability	1.5	1.1
Wanted more effective method	4.5	8.0
Inconvenient to use	3.0	2.6
Infrequent sex, husband away	29.5	8.5
Others	6.9	6.5

Reasons for not Using Family Planning Methods

Various reasons were given for not using FP. At the intrapersonal level, a few of the respondents' themselves reported being opposed to using FP methods; only 1.1% of the adolescents and 4.4% of the older women. Fear of side effects and health concerns were also cited by 5.6% of the adolescents and 20.8% of older women. Methods being inconvenient to use was given by 0.2 of the adolescents and 0.9% of the older women. In comparison, fear of interfering with the body's processes was cited by 1.7% of adolescents and 2.9% of older women. Not knowing of a method was cited by 1.5% of adolescents and 2.4% of older women, while not knowing any source of the method was given to not use FP by 0.8% of the adolescents and 1.0% of older women. (how can I do cross tabs to see if there is any significant difference between the adolescents and older women)

At the interpersonal level, various reasons were given for not using FP methods. Husbands or partner's opposition was cited by 0.9% of the adolescents and 4.0% of the older women. At the community level, an equal percentage (0.1%) of adolescents and older women indicated that they did not use FP methods due to opposition from other people and a similar proportion between both groups cited religious prohibition as the reasons. At the organizational level, various reasons were given for not using FP; lack of access or the services being too far, 0.1% of the adolescents and 0.3% of the older women; high cost, 0.2% of the adolescents and 0.8% of the older women; unavailability of the preferred method, 0.1% of the adolescents and 0.3% of older. Table 7 summarizes the various reasons given by adolescents for not using FP.

Table 7

Reasons for not Using Family Planning Methods by Adolescents

Variable		Adolescents		Older Women	
		Frequency	Percent	Frequency	Percent
Respondent opposed	No	1389	98.9	3444	95.6
	Yes	16	1.1	160	4.4
husband/partner opposed	No	1393	99.1	3461	96.0
	Yes	12	.9	143	4.0
others opposed	No	1403	99.9	3600	99.9
	Yes	2	.1	4	.1
religious prohibition	No	1391	99.0	3487	96.8
	Yes	14	1.0	117	3.2
knows no method	No	1384	98.5	3516	97.6
	Yes	21	1.5	88	2.4
knows no source	No	1394	99.2	3567	99.0
	Yes	11	.8	37	1.0
fear of side effects/health	No	1326	94.4	2856	79.2
concerns	Yes	79	5.6	748	20.8
lack of access/too far	No	1404	99.9	3592	99.7
	Yes	1	.1	12	.3
costs too much	No	1402	99.8	3576	99.2
	Yes	3	.2	28	.8
interferes with body	No	1402	99.8	3570	99.1
	Yes	3	.2	34	.9
inconvenient to use	No	1381	98.3	3499	97.1
	Yes	24	1.7	105	2.9
preferred method not	No	1404	99.9	3592	99.7
available	Yes	1	.1	12	.3

Information on Family Planning for Those Who Obtained Family Planning Methods

For the respondents who took an FP method, information was given to them on FP. Among the adolescents, 47.7% of them were told about side effects compared to 54.3% of the older women. Three-point eight percent of the adolescents were told about side effects by health or FP worker adolescents compared to 11.8% of the older women. Information on any other method (besides the one they took) was given to 59.6% of the adolescents compared to 69.6% of the older women. Health or FP worker told 15.3% of adolescents about other FP methods compared to 26.1% of the older women. See Table 8 for a summary of these results.

Table 8

Information on Family Planning given to Adolescents who Obtained Family Planning Methods

Variable		Adolescents		Older Women	
		Frequency	Percent	Frequency	Percent
Told about side effects	No	79	52.3	1793	45.7
	Yes	72	47.7	2128	54.3
Told about side effects by health or FP worker	No	76	96.2	1584	88.2
	Yes	3	3.8	211	11.8
Told how to deal with side effects	No	11	15	287	14.7
	Yes	64	85	2051	85.3
Told about other FP methods	No	61	40.4	1194	30.4
	Yes	90	59.6	2731	69.6
Told about other FP methods by health or FP worker	No	50	84.7	870	73.9
	Yes	9	15.3	308	26.1

Association of Various Factors with the Uptake of Family Planning Among Adolescents in Kenya

Various sociodemographic characteristics were tested for association with the use of FP using the chi-square test. For literacy, 95.5%. of the adolescents using a modern

method can read compared to 91.8% of those not using. The association between being able to read and using a modern method is statistically significant; X^2 (1, N = 6049) = 8.32, p = .004. Of the adolescents using a modern method of FP, 12.9 % had education attainment of secondary education and above compared to 8.6% of those not using a modern method. The association between having a secondary education level education and higher and use of modern method is statistically significant; X^2 (1, N = 31079) = 9.69, p = .002. Of those using modern methods, 58.2% were in the not poor category compared to 52% of those not using. The association between wealth status and use of modern method was statistically significant X^2 (1, N = 6078) = 4.8, P =.028. of those using modern methods, 53% were in union currently or had ever been compared to 10.9% among those not using. The association of ever having been in union and using FP is significantly significant; X^2 (1, N = 6078) = 632.65, $p < .01$. Of those using modern methods, 40.3% were living in the urban areas compared to 31.3% of those not using. The association between using a modern method and place of residence is statistically significant; X^2 (1, N = 6078) = 16.12, $p < .01$.

There was a statistically significant difference between the mean age of adolescents at first birth of those using a modern method and those not using a modern method; t 896 degrees of freedom is equal to -2.287 p equals .022, two-tailed. The mean age at first cohabitation of adolescents using a modern method was 16.12 years and that of those not using a modern method was 16.35 years. The difference in the mean age of adolescents at first cohabitation of those using a modern method and those not using a

modern method is not statistically different; *t* 586.03 degrees of freedom is equal to -.503 *p* equals .615, two-tailed. The results are summarized in Table 9.

Table 9

Summary of Chi-Square Results for Sociodemographic Characteristics and Use of Modern Methods of Family Planning Among Adolescents

Sociodemographic Characteristics	Not using a modern method	Using a modern method	Statistical results using chi-square
Wealth			
Poor	2634 (47%)	198(41.8%)	X^2 (1, N = 6078) = 4.8 , P=.028
Not poor	3246 (53%)	276(58.2%)	
Education Level			
Below Secondary	5121 (91.4%)	413(81.1%)	X^2 (1, N = 6078) = 9.69, P=.002
Secondary and above	483 (8.6%)	61(18.9%)	
Literacy level			
Cannot read	457 (8.2%)	21(4.5%)	X^2 (1, N = 6049) = 8.32, P=.004
Can read	5121 (91.8%)	450(95.5%)	
Marital status			
Never been in union	4991 (89.1%)	223(47%)	X^2 (1, N = 6078) = 632.65, p < .01
Ever been in union	613 (10.9%)	251(53.0%)	
Place of residence			
Urban	1756 (31.3%)	191(40.3%)	X^2 (1, N = 6078) = 16.12, p < .01
Rural	3848 (68.7%)	283(59.7%)	

Intrapersonal Characteristics

Ninety-four point six percent of adolescents reported knowing of a modern method of FP while 97.4 of older women said they knew a modern method of FP. Among the adolescents 8.2% of those who knew a modern method, were actually using one, none of those who reported not knowing a method was using. The association between knowing a modern method and using one is statistically significant; chi-square equals 29.23 with 1 degree of freedom *p* is less than 0.01.

The survey assessed the means by which the respondents were getting FP messages over the last few months preceding the survey. They evaluated the radio, TV and newspapers/magazines. Majority of the respondents had heard FP messages through the radio with 59.7% of adolescents and 69.3% of older women having heard. Of the adolescents using a modern method, 76.2% had heard FP messages through the radio. The association between hearing the messages through the radio and using a modern method was statistically significant; chi-square equals 25.48 with 1 degree of freedom *p* is less than .001. Those who reported having heard FP messages on TV were fewer than those hearing from the radio; 32% of the adolescents and 38.4% of the older women had heard. Of the adolescents using modern FP method 43.8% had heard FP messages through the TV. The association between hearing FP messages on TV and using and using a modern method is statistically significant; chi-square equals 114.42 with 1 degree of freedom *p* is less than .001. Less than a quarter of the respondents had seen FP messages in the newspapers/magazines with 23.4% of adolescents and 23.9% of older women having seen. Of the adolescents using modern FP methods, 31.9% had seen FP

messages in the newspaper/magazine. The association between seeing FP messages in the newspaper/magazine and using a modern method was statistically significant; chi-square equals 19.04 with 1 degree of freedom *p* equals .03.

Thirty-five point seven percent (35.7%) of the adolescents reported to have seen FP informational materials compared to 45.2% of older women. The association between using a modern method and having seen FP informational materials is statistically significant; chi-square equals 33.92 with 1 degree of freedom *p* is less than 0.01.

Nine point two percent (9.2%) of the adolescents received FP messages through social media compared to 11.0% of the older women. The association between receiving messages through social media and using a modern method is not statistically significant; chi-square equals 2.84 with 1 degree of freedom p equals 0.09. Four point eight percent of the adolescents received FP messages through the mobile via text/email compared to 6.3% of the older women. The association between receiving FP messages via text/email is statistically significant; chi-square equals 3.86 with 1 degree of freedom p is equal to 0.05.

Slightly over half of the adolescents (52.8%) reported being the main decision makers on FP compared to 73% among the older women. Among the adolescents using a modern method 52.9% reported to be the main FP decision makers compared to 50% among those not using a modern method. The association between using a modern method and making own decision on FP is not statistically significant; chi-square equals 0.01 with 1 degree of freedom *p* equals 0.94.

Interpersonal Level

More than half of the adolescents, 58.5% of adolescents reported that their Husband / partner approves use of FP compared to 68.7 of the older women. Of the adolescents using a modern method, 89% reported that their husband/partner approved the use of FP. The association between using a modern method and having a husband/partner who approves the use of FP is statistically significant; chi-square equals 47 with 1 degrees of freedom *p* is less than 0.01. Thirty-eight percent of the adolescents reported having never talked to their husband / partner on FP compared to 30% of the older women. Of the adolescents using the modern method, 90.1% reported of having talked to their husbands/partners on FP. The association between using a modern method and talking to the husband/partner on FP is statistically significant; chi-square equals 42.1 with 1 degree of freedom *p* is less than 0.01. Ninety-one percent of the adolescents reported that their husband/partner knew you they were using FP compared to 90.7% of the older women.

Community Factors

Seventeen point four percent of the adolescents heard FP messages at public forums compared to 36.5% of the older women. Of the adolescents using modern methods, 27.6% had heard FP messages in a public forum. The association between using a modern method and hearing FP messages in a public forum is statistically significant; chi-square equals 16.33 with 1 degree of freedom *p* is less than 0.01.

Nineteen point six percent (19.6%) of the adolescents reported having heard political, religious, or community leaders talk favorably at bout FP compared to 32.8% of

the older women. The association between having heard political, religious, or community leaders talk favorably at bout FP is statistically significant; chi-square equals 16.85 with 1 degree of freedom *p* is less than 0.01.

Organization Factors

Very few of the respondents were visited by a FP worker; 4.8% of adolescents and 7.8% of older women, in the preceding last 12 months. Of the adolescents using a modern method of FP, 11% were visited by a FP worker. Only 3.5% of the adolescents were visited by a health worker to discuss FP compared to 8.2% of the older women. The association between using a modern method and having been visited by a health worker to discuss FP is statistically significant; chi-square equals 14.19 with 1 degree of freedom *p* is less than 0.01. The association between being visited by a FP worker and using a modern method of FP is statistically significant; chi-square equals 19.23 with 1 degree of freedom *p* is less than 0.01.

Eleven point three percent (11.3%) of the adolescents were told about an FP method at the facility compared to 28.6% of the older women. Of the adolescent using a modern method, 33.3% were told about a method at the health facility. The association between being told of an FP method at the facility and using a modern method is statistically significant; chi-square equals 67.56 with 1 degree of freedom *p* is less than 0.01. Forty-four point three percent (44.3%) of the adolescents reported to have visited the health facility within the preceding 12 months of the interview compared to 68.7% of the older women. Of the adolescents who were using a modern method of FP 65.7% had visited the health facility. The association between visiting the health facility and using

FP method is statistically significant; chi-square with 1 degrees of freedom equals 42.18 *p* is less than 001. Thirty-six point seven percent (36.7%) were asked of their FP needs after the delivery of their last baby compared to 48.8% of the older women. Of the using a modern method 49.6% were asked of their FP needs after delivery compared to 30.1% of those not using a modern method. The association between using a modern method and having been asked of the FP needs after delivery is statistically significant; chi-square equals 14.24 with 1 degree of freedom *p* is less than 0.01.

Utilization of Services (Covariates)

The survey enquired on various services utilization aspects for the last delivery within the preceding five years. Among the adolescents 65.1% delivered in a health facility compared to 58.9% of the older women. Of the adolescents who were using a modern method of FP, 72.3% delivered in a facility. The association between using a modern method and having delivered in a facility is statistically significant; chi-square equals 11.74 with 1 degree of freedom *p* is less than 0.01.

Five point eight percent of the adolescents had delivered by caesarean section (C/S) compared to 7.9% among the older women. Among adolescents had delivered by C/S 36.5% were using a modern method compared to 36.9% among those who did not deliver by C/S. The relationship between having delivered by C/S and the use of a modern method is not statistically significant; chi-square equals .003 with 1 degree of freedom *p* equals 0.96.

Eighty-seven percent (87.6%) of the adolescents reported having taken their infants for the first DPT immunization compared to 93.2% of the older women. Among

the adolescents using a modern method, 97.8% had taken their infants for the first DPT compared to 81.5% among those not using a modern method. The association between using a modern method and having taken the infant for DPT immunization is statistically significant; chi-square equals 49.61 with 1 degree of freedom *p* is less than 0.01.

Sixty-five percent of the adolescents reported having taken their infants for PNC and 63.2% of the older women had taken babies for the PNC. Among the adolescents using a modern method 71.1% had taken their infants for PNC compared to 61.9% of those not using a modern method. The association between using a modern method and having taken the infant for PNC is not statistically significant; chi-square equals 3.41 with 1 degree of freedom *p* equals 0.07.

Among the adolescents, 92.8% had attended ANC during their last pregnancy. Of those using a modern method 96.3% had attended ANC compared to 90.7% of those not using a modern method. The association between using a modern method and having attended ANC is statistically significant; chi-square equals 9.73 with 1 degree of freedom *p* equals 0.002. Sixty-five percent had delivered in a health facility. Of the adolescents using a modern method 72.3% had delivered in a facility compared to 60.9% of those not using a modern method. The association between using a modern method and having delivered in a facility is statistically significant; chi-square equals 11.74 with 1 degree of freedom *p* equals 0.001. From these results the Ho 1 that intrapersonal, interpersonal, community, and organizational factors are not associated with the uptake of FP among adolescents in Kenya was rejected.

Extent of Association of Family Planning Use with Various Characteristics Among Adolescents

To determine the extent of various variables in contributing to the uptake of FP among adolescents, a binary logistic regression was performed. The logistic regression model was statistically significant, $\chi^2(11) = 44.02$, $p < .001$. The model explained 15.0% (Nagelkerke R^2) of the variance in the use of FP and correctly classified 67.5% of cases. The sensitivity was 29.8%, and the specificity was 87%. The following predictor (independent) variables were statistically significant: the place of delivery ($p = .029$), having seen FP informational materials ($p = .011$), having been visited by a health worker to discuss FP ($p = .029$), having heard FP messages through the T.V ($p = .018$), and having been asked of their FP needs after delivery ($p = .003$). The adolescents who delivered at a facility had increased odds of using FP compared to those who did not, OR = 1.78; 95% CI [1.06, 2.98]. Those who had seen FP informational materials had higher odds of using FP than those who had not seen, OR = 1.93; 95% CI [1.16, 3.20]. Having seen FP messages on T.V increased the odds of using FP, OR = 1.89; 95% CI [1.12, 3.21], while having been asked of one's FP needs after delivery increased the odds of using FP, OR = 2.04, 95% CI [1.27, 3.28]. Table 10 summarizes the significant associations.

Table 10

Extent of Association of Family Planning Use Among the Adolescents and Various Characteristics

Characteristics					95% C.I.	
	Wald	df	Sig.	Exp(B)	EXP(B)	Wald
Organizational level						
Place of delivery	4.762	1	.029	1.778	1.060	2.983
Visited by health worker to discuss FP	4.703	1	.030	.256	.075	.877
Asked about your FP needs after delivery	8.791	1	.003	2.044	1.274	3.278
Intrapersonal level						
Seen FP informational material	6.414	1	.011	1.926	1.160	3.198
Heard FP on TV last few months	5.610	1	.018	1.894	1.116	3.211

These results indicate that among the adolescents in Kenya, factors at the intrapersonal and organizational level of the SEM contribute most significantly to the uptake of FP.

Postpartum Women

To answer the second research question regarding the extent to which intrapersonal, interpersonal, community, and organizational factors are associated with the uptake of FP among the postpartum women in Kenya, first baseline socio-demographics and other descriptive characteristics of postpartum women were analyzed. Second the bivariate analysis using chi-square test was done and finally the significant factors that met the assumptions of the logistic regression model was done.

Baseline Descriptive and Demographic Characteristics of the Postpartum Women

Of all the respondents 14% (4338) of the women had delivered within one year of the interview, thus for the purposes of this study, they are considered to be within the postpartum period. Those who did not deliver within one year prior to the study were

classified as other women. Of these postpartum women, 11.4% were adolescents while among the other women 29.5% were adolescents. Majority of the pot-partum women (29%) were in the age group 20 to 24 years old followed by age group 25 to 29 years (28.1%). The postpartum women mean age was 29.28 years while that of the other women was 26.84 years.

The highest percentage of postpartum women was from the Rift Valley region (33.8%) followed by the Eastern region (14.7) and 66.9% were living in the rural areas. The other women had a similar pattern with the Rift Valley region having the majority at 28.4% followed by Eastern region with 17.2% and 61.9% were from rural areas. Of the postpartum women, 83.8% were in marital unions compared to 57.6% of the other women. Majority (72.6%) of the postpartum women had primary level education and below with only 6.8% having an education level of beyond secondary school. The other women had a similar pattern with 62.2% having a primary school education level and below and 8.9% having education attainment above secondary More than half (55.6%) of these women were in the poor wealth quintile with 16.7% being in the middle and 27.7% in the rich status. The other women had 40.5% in the poor wealth status, 19.5% in the middle and 40.0% in the rich wealth status. On literacy, 62.6% of the postpartum women could read and 74.5% of the other women were able to read. The social-demographic characteristics of the respondents are summarized in Table 11.

The mean age of postpartum women at first birth was 19.37 years and the mean age at first cohabitation is 18.7 years. The mean age of other women at first birth is 19.4 years and their mean age at first cohabitation is 19.1 years.

The difference between the postpartum women and the other women for various characteristics was done using the chi-square test of independence. The difference between the two groups of women marital status was statistically significant; chi-square equals 1122.73 with 2 degrees of freedom *p* is less than 0.01. The difference between the postpartum and the other women in education attainment was statistically significant; chi-square equals 174.92 with 2 degrees of freedom *p* is less than 0.01. There was a statistically significant difference between the wealth status of the postpartum women and that of the other women; chi-square equals 363.14 with 2 degrees of freedom *p* is less than 0.01. on literacy, the difference between the two groups of women was statistically significant; chi-square equals 270.2 with 2 degrees of freedom *p* is less than 0.01.

Table 11

Sociodemographic Characteristics of Postpartum and Other Women

Variable		Postpartum women Percent (*N* = 4,332)	Other women Percent (*N* = 26,682)
Region	Coast	13.3	12.4
	North Eastern	7.3	5.0
	Eastern	14.7	17.2
	Central	6.1	10.7
	Rift Valley	33.8	28.4
	Western	9.1	9.1
	Nyanza	13.2	13.8
	Nairobi	2.4	3.3
Marital Status	Never in union	9.0	30.6
	In union	83.8	57.6
	No longer in union	7.1	11.8
Residence	Urban	33.1	38.1
	Rural	66.9	61.9
Educational attainment	Primary school and below	72.6	62.2
	Secondary	20.6	28.8
	Above secondary	6.8	8.9
Wealth Status	Poor	55.6	40.5
	middle	16.7	19.5
	Rich	27.7	40.0
Literacy		(*n* = 4,332)	(*n* = 26,682)
	Cannot read	37.2	25.2
	Able to read	62.6	74.5
	Not applicable	.2	.3

The difference in the distribution of the postpartum women and other women by area of residence (urban and rural) is statistically significant chi-square equals 39.21 with 1 degree of freedom *p* is less than 0.01. The difference in the distribution of the postpartum women and other women through the regions is statistically significant chi-square equals 176.88 with 7 degrees of freedom *p* is less than 0.01.

Use of Modern Family Planning Methods by Postpartum Women

Among the postpartum women 36.3% were using modern methods of FP during the interview compared to 35.3% of the other women. The difference between the

postpartum women and the other women in the use of modern methods is statistically significant; chi-square equals 59.75 with 1 degree of freedom, *p* is less than 0.01. As many as 62.8% reported intention of using FP later. The most used method both by the postpartum women (22.5%) and the other women (17.0%) was the injectable followed by pills. Only 1.1% the postpartum women were using the IUD while 6.2% of were using implants and 0.4% were using the LAM. Over 40% reported that they had never used FP before. Various reasons were given for not using FP by the postpartum women. Less than one percent of the women not using FP cited cost or lack of access as the reasons for not using.

Table 12

Pattern of use Among Postpartum and Other Women

	Postpartum women Percent (*n* = 4,338)	Other women Percent (*n* = 26,741)
Currently using (all methods)	38.7	38.7
Used since last birth	32.3	37.7
Used before last birth	10.1	3.6
Never used	18.9	19.9

Table 13

Use of Family Planning Modern Methods Among Postpartum and Other Women

Method type	Postpartum women			Other women
	Frequency	percent	Frequency	percent
Pill	160	10.1	1279	13.6
IUD	49	3.1	565	7.0
Injections	977	62.1	4539	48.1
Condom	69	4.4	717	7.6
Female sterilization	31	2.0	621	6.6
Male sterilization			3	0.03
Implants/Norplant	268	17	1701	18
Lactational amenorrhea (LAM)	17	1.1	3	0.03
Female condom	2	0.1	9	
Total	1573	100	9437	100

Methods Discontinuation

Among the postpartum women 15.7% reported having discontinued a method within the previous five years of the survey with 87.7 % discontinuing use of a modern method. There was a statistically significant difference between the discontinuation of modern methods and the other methods; chi-square equals 74.402 with 1 degree of freedom *p* is less than 0.01. Injectables were the most discontinued methods at 10.4% followed by the pill at pill 4.1%. Majority of the reasons given for discontinuation was the desire to become pregnant (46.5%) or having gotten pregnant 19.6%. Reasons for discontinuation were grouped according to the method related ones (side effects, health concerns, desires for a more effective method and inconvenience use) and those not method related. Nearly a quarter of the discontinuation (24.1%) was due to method related reasons. The association between discontinuation of a modern method and a method related reason is statistically significant; chi-square equals 29.7 with 1 degree of freedom and *p* is less than 0.001.

Table 14

Type of Method discontinued Among Postpartum Women and Other Women

Type of method discontinued	Postpartum women Percent (*n* = 4338)	Other women Percent (*n* = 26741)
Modern method	15.7	11.2
Other methods	84.3	88.8

Association of Various Factors with the Uptake of Family Planning Among Postpartum Women in Kenya

Sociodemographic Characteristics

Among the postpartum women who were using a modern method 24.7% had a

secondary level of education and above compared to 13.5% who were not using a modern method. The association between having a secondary education level and above and use of a modern method of FP is statistically significant; X^2 (1, N = 4338) = 123.36, $p > .001$.

The mean age of postpartum women at first birth of those using a modern method was 19.63 years and that of those not using a modern method was 19.22 years. There was a statistically significant difference between the mean age of postpartum women at first birth between those using a modern method and those not using a modern method; *t* 4336 degrees of freedom is equal to -3.760 *p* is less than .01, two-tailed. The mean age at first cohabitation of postpartum women using a modern method was 19.35 years and that of those not using a modern method was 18.35 years. The difference between the mean age of postpartum women at first cohabitation of those using a modern method and those not using a modern method is statistically significant; *t* 3944 degrees of freedom is equal to -8.188 *p* is less than 0.01, two-tailed. The chi-square results of the association of socio-demographic characteristics and the use of FP are summarized in Table 15.

Table 15

Chi-square Results of the Association of Sociodemographic Characteristics and Use of Family Planning

Sociodemographic characteristics	Not using a modern method	Using a modern method	Results
Wealth			
Poor	1773 (64.1%)	638(40.6%)	X^2 (1, N = 6078) = 4.8
Not poor	992 (35.9%)	935(59.4%)	, *P*=.028
Education level			
Below secondary	2391 (86.5%)	2391(75.3%)	X^2 (1, N = 4338) =
Secondary and above	374 (13.5%)	374(24.7%)	225.48, $p < .01$
Literacy level			
Cannot read	1073(37.8%)	145(9.3%)	X^2 (1, N = 4338) =
Can read	1715 (62.2%)	1420(90.7%)	408.43, $p < .01$
Marital status			
Never been in union	302 (10.9%)	90(5.7%)	X^2 (1, N = 4338) =
Been in union	2463 (89.1%)	1483(94.3%)	32.99, $p < .01$
Place of residence			
Urban	781 (28.2%)	655(41.6%)	X^2 (1, N = 4338) =
Rural	1984 (71.8%)	918(58.4%)	81.23, $p < .01$

Association of Different Characteristics with Use of Family Planning Among Postpartum Women

Intrapersonal Level

There was almost universal knowledge of a modern method with 96.4% of the postpartum women and even among the other women with 97% of them reporting they knew of a method. The survey enquired on who had heard/seen FP messages over the radio, TV, or newspaper/magazine over the past few months preceding the interview. Among the postpartum women 61.7% had heard FP messages over the radio, 28.5% through the TV, and 17.7% through the newspaper/magazine. Of the postpartum women using a modern FP method, 78.7% had had FP messages through the radio compared to 52.1% of those not using a modern method. There is a statistically significant association

between hearing FP messages through the radio and using a modern method of FP; chi-square equals 144.53 with 1 degree of freedom *p* is less than 0.01. Of the postpartum women using modern methods, 42.1% had heard FP messages through the TV compared to 20.7%. among those not using a modern method. There is a statistically significant association between the use of modern methods and having heard FP messages through the TV; chi-square equals 95.67 with 1 degree of freedom *p* is less than 0.01. Of the postpartum women using a modern method 25.2% had seen FP messages through a newspaper/magazine compared to 13.5% among those not using. The association between having seen FP messages in the newspapers/magazine is statistically significant; chi-square equals 32.30 with 1 degree of freedom *p* is less than 0.01.

Among the postpartum women, 37.6% had seen FP informational materials. Of those using modern 51.7% had seen FP informational materials compared to 29.6% of those not using a modern method. The association between having seen FP informational materials and using a modern method is statistically significant; chi-square equals 100.41 with 1 degree of freedom *p* is less than 0.01.

Seven point eight percent of the postpartum women had received FP messages through social media and 5.1% had received FP messages through mobile via text or email. Of the postpartum women using a modern method 11.8% had received FP messages through social media compared to 5.5% of those not using a modern method. The association between receiving FP messages through social media and using a modern method is statistically significant; chi-square equals 26.16 with 1 degree of freedom *p* is less than 0.01. Among the postpartum women using modern methods 7.7% had received

FP messages through mobile via text or email compared to 3.7% of those not using a modern method. The association between receiving FP messages through the mobile via text or email and using a modern method is statistically significant; chi-square equals 15.98 with 1 degree of freedom *p* is less than 0.01. Sixty-seven point three percent (67.3%) of the postpartum women reported that they were the main decision makers on FP. Among those using a modern method, 67.6 reported to be the main decision makers on FP compared to 61.5% of those not using a modern method.

Interpersonal Factors

Among the postpartum women, 65.2% reported that their husbands/partners approved the use of FP. Among those using a modern method of FP 88.7% reported that their partners/husbands approved FP use compared to 50.6 of those not using FP. The association between the use of a modern methods and the husband/partners' approval is statistically significant; chi-square equals 263.73 with 1 degree of freedom, *p* is less than 0.01.

Seventy-one point none of the postpartum women reported never to have talked to their husbands/partners on FP. Of those using a modern method, 91.1% reported to have talked to their husbands/partners on FP compared to 58.7% of those not using a modern method. The association between the using a modern method and having talked to the husband/partners on FP is statistically significant; chi-square equals 210.89 with 1 degree of freedom, *p* is less than 0.01.

Among the postpartum women 69.4% reported to have talked to their husband /partner on FP and 90% reported that their husband/partner knew they were using FP. Of

those using FP 91.1% reported to have ever talked to their husbands/partners on FP compared to 58.7% who were not using a modern method. The association between having talked to the husband/partner on FP and the use of a modern method is statistically significant; chi-square equals 210.89 with 1 degree of freedom *p* is less than 0.01. Of those using a modern method 89.8% reported that their husband/partner knew they were using FP methods compared to 92.9% of those who were not using. The association between the husband/partner knowing that the respondent was using FP and the use of modern method is not statistically significant; chi-square equals 0.27 with 1 degree of freedom *p* equals 0.60.

Community Factors

Slight over a quarter (28.3%) of the postpartum women had heard FP messages in public forums and of those using modern FP, 36.7% had heard FP messages in a public forum compared to 28.5% who were not using a modern method. The association between having herd FP messages in a public forum and using a modern method is statistically significant; chi-square equals 40.72 with 1 degree of freedom *p* is less than 0.01

Slightly over a quarter (26.4%) of the postpartum women heard political, religious, or community leaders talk favorably at about FP. Of those using a modern method 35.9% had heard political, religious, or community leaders talk favorably at about FP compared to 21% of those not using a modern method. The association between having heard political, religious, or community leaders talk favorably at about FP and

using a modern method is statistically significant; chi-square equals 55.15 with 1 degree of freedom *p* is less than 0.01.

Organizational Factors

Over the last 12 months preceding the survey, 9.8% of the postpartum women were visited by a FP worker, while 78.2% had visited a health facility and 38.2% had been told at the health facility. Forty-three point eight percent (43.8%) of the postpartum women were asked of their FP needs during their last delivery. Of those using a modern method 56.8% were asked of their FP needs compared to 35.9% of those not using a modern method. The association between having been asked of their FP needs during their last delivery and using a modern method is statistically significant; chi-square equals 81.64 with 1 degree of freedom, *p* equals 0.01.

Only 8.2% of the postpartum women were visited by a health worker to discuss FP. Of those using modern FP 9.6% were visited by a health worker to discuss FP compared to 5.7% of those not using a modern method. The association between being visited by a health worker to discuss FP and using a modern method is statistically significant; chi-square equals 14.42 with 1 degree of freedom *p* is less than 0.01.

Of the postpartum women using a modern method of FP, 11.0% been visited by FP worker within the past 12 months of the survey, compared to 9.1% of those not using a modern method. The association between having been visited by a health worker and using a modern method is not statistically significant; chi-square equals 1.86 with 1 degree of freedom *p* equals 0.17. Among the postpartum women using a modern method 86.2% visited the health facility within the past year preceding the survey, compared to

73.7% of those not using a modern method. There is a statistically significant association between having visited a health facility and using a modern method; chi-square equals 44.48 with 1 *p* is less than 0.01. Of the postpartum women using a modern method of FP 43.9% were told about FP at the health facility compared to 34.4% of those not using. The association between use of modern FP and having been told about FP in a health facility is statistically significant; chi-square equals 15.13 with 1 degree of freedom *p* is less than 0.01.

Utilization of Services (Covariates)

Among the postpartum women 93.4% attended ANC at least once during the last pregnancy prior to the survey. Of those using a modern method, 97.8% had attended ANC compared to 90.9% who were not using a modern method. The association between having attended ANC and using a modern method is statistically significant; chi-square equals 76.39 with 1 degree of freedom *p* is less than 0.01. Among the postpartum women 60.3% had delivered in a facility. Of those using a modern method, 76.1% had a facility delivery compared to 51.2% among those not using a modern method. The association between having delivered in a facility and using a modern method is statistically significant; chi-square equals 256 with 1 degree of freedom *p* is less than 0.01. Seven point seven percent of the postpartum women had delivered by caesarean section (C/S). Among those using modern methods 10.3% had delivered by C/S compared to 6.3% among those not using a modern method. There was a statistically significant relationship between having delivered by C/S and the use of a modern method; chi-square equals 22.41 with 1 degree of freedom *p* is less than 0.01. Eighty-three point three percent

(83.3%) of the postpartum women reported to have taken their infants for DPT at first month after the last delivery. Of those using a modern method 98.4% had taken their infants for DPT 1 compared to 75.2% of those not using. The association between having taken the infant for DPT 1 and using a modern method is statistically significant; chi-square equals 346.23 with 1 degree of freedom *p* is less than 0.01. Fifty-nine percent (59%) of the postpartum women took their infants for PNC two months post-delivery. Of those using a modern method 71% had taken their infants for PNC compared to 52.3% of those note using a modern method. The association between having taken the infant for PNC and using a modern method is statistically significant; chi-square equals 69.57 with 1 degree of freedom *p* is less than 0.01.

The association between having taken the infant for PNC and using a modern method is not statistically significant; chi-square equals 0.206 with 1 degree of freedom p equals 0.65. Considering these results, the *H*o 2 that intrapersonal, interpersonal, community, and organizational factors are not associated with the uptake of FP among postpartum women in Kenya was rejected.

Extent of Association of Family Planning Use with Various Characteristics Among the Postpartum Women

To determine the extent of association of various variables and the uptake of FP among postpartum women, a binary logistic regression was performed. The variables were grouped according to those that are related to seeking care and those that are not. For the variables related to seeking care, the logistic regression model was statistically significant, $\chi 2(7) = 225.38$, $p < .001$. The model explained 23.8% (Nagelkerke R^2) of the

variance in the use of FP and correctly classified 67.5% of cases. The sensitivity was 72.2%, and the specificity was 63.3%. The following predictor (independent) variables were statistically significant: the place of delivery (p <.001), having taken the baby for PNC (p = .006), Having taken the baby for immunizations at six weeks (p < .001), and having been asked of one's FP needs after p = .002.

The post–partum women who delivered at a facility had increased odds of using FP compared to those who did not, OR = 3.05; 95% CI [2.304,4.040]. Those who had taken the baby for immunizations at six weeks had higher odds of using FP than those who had not, OR = 1.93; 95% CI [6.64, 22.70]. Having seen FP messages on T.V increased the odds of using FP, OR = 1.89; 95% CI [1.12, 3.21], while having been asked of one's FP needs after delivery increased the odds of using FP, OR = 1.54, 95% CI [1.169, 2.015].

For the other variables, the logistic regression model was statistically significant, $\chi 2(7) = 330.77$, $p < .001$. This model explained 33.4% (Nagelkerke R2) of the variance in the use of FP and correctly classified 71.5% of cases. The sensitivity was 78.1%, and the specificity was 65.4%. The following predictor (independent) variables were statistically significant: having seen FP messages in the T.V (p <.001), having husband's approval (p < .001), and having talked to the husband on FP (p =.030). Having seen FP messages on T.V increased the odds of postpartum women using FP, OR = 1.47, 95% CI [1.05, 2.05]. Having the husband's approval to use FP increased the odds of using, OR = 3.57, 95% CI [2.40, 5.3] while having talked to the husband about FP increased the odds of using OR = 1.67, CI [1.051, 2.659]. According to these results among the postpartum women in

Kenya, factors at the intrapersonal and inter-personal level of the SEM contribute most significantly to the uptake of FP.

Distribution of Factors Associated with Family Planning Uptake Among Adolescents Across the Counties in Kenya

To answer research question three, the extent to which intrapersonal, interpersonal, community, and organizational factors associated with FP uptake among postpartum women and adolescents differ by counties in Kenya, the distribution of the factors that were found to be significant in question one and two was analyzed. Using the chi-square test, the difference in this distribution was tested to determine if it was statistically significant. The survey had grouped counties into eight regions following the administrative demarcation that existed in the earlier constitution. This categorization was used.

Demographic Characteristics of Adolescents Across the Regions in Kenya

Analysis was done to determine the distribution of various characteristics of adolescents across the counties in Kenya. North eastern (N/E) is leading with the highest proportion of adolescents being poor (60.9%), followed by the Coast region (56.9%). Nairobi has the lowest percentage of adolescents in the poor bracket (0.8%), followed by Central at 19.3% and Western at 39.8%. The N/E region leads with the highest proportion of residents who cannot read (41.5%) followed by Rift Valley (8.9%). N/E has the lowest education attainment with 77.7% of the adolescents having education level of primary and below, followed by Coast with 70.0%. Central the lowest number of adolescents with education attainment of primary school and below (27.8%), followed by at Nairobi 28%

and Nyanza at 54.6%. N/E has the highest proportion of adolescents who cannot read (41.5%) followed by Rift Valley at 8.9%. Central has the lowest proportion of adolescents who cannot read (1.3%) followed by Nyanza at 2.3% and Nairobi at 2.4%. N/E region has the lowest proportion of adolescents using modern FP methods (0.6%) followed by Central at 6.4% and then Eastern at 7.2%. Nairobi leads with 15.2% of adolescents using modern FP methods followed by Nyanza at 12% and Coast at 8.1%. Table 16 summarizes the proportion of selected characteristics across the regions.

Table 16

Distribution of Various Characteristics Among the Adolescent Across Regions

Characteristics		Region								
		Co	N/ E	E	Cent	R/ V	W	Nya	Nai	Total
Wealth index										
poor	Frequency	459	218	523	93	866	269	403	1	2832
	%	56.9	60.9	50.7	19.3	51.0	39.8	44.8	0.8	46.6
Not poor	Frequency	348	140	509	389	832	407	497	124	3246
	%	43.1	39.1	49.3	80.7	49.0	60.2	55.2	99.2	53.4
Marital status										
Never been in union	Frequency	650	286	922	446	1430	599	775	106	5214
	%	80.5	79.9	89.	92.5	84.2	88.6	86.1	84.8	85.8
In/have been in union	Frequency	157	72	110	36	268	77	125	19	864
	%	19.5	20.1	10.7	7.5	15.8	11.4	13.9	15.2	14.2
Place of residence										
Urban	Frequency	278	186	313	173	439	152	281	125	1947
	%	34.4	52. 0	30.3	35.9	25.9	22.5	31.2	100. 0	32.0
Rural	Frequency	529	172	719	309	1259	524	619	0	4131
	%	65.6	48.	69.7	64.1	74.1	77.5	68.8	0.0	68.0
Literacy										
Cannot read	Frequency	70	148	63	6	151	16	21	3	478
	%	8.7	41. 5	6.1	1.3	8.9	2.4	2.3	2.4	7.9
Can read	Frequency	732	209	966	473	1540	656	874	121	5571
	%	91.3	58.5	93.9	98.7	91.1	97.6	97.7	97.6	92.1
Education level										
Primary and below	Frequency	565	279	564	134	1048	386	491	35	3502
	%	70.0	77.9	54.7	27.8	61.7	57.1	54.6	28.0	57.6
Secondary and above	Frequency	242	79	468	348	650	290	409	90	2576
	%	30.0	22.1	45.3	72.2	38.3	42.9	45.4	72.0	42.4
Use of modern method										
Not Using	Frequency	742	356	958	451	1568	631	792	106	5604
	%	91.9	99.4	92.8	93.6	92.3	93.3	88.0	84.8	92.2
Using	Frequency	65	2	74	31	130	45	108	19	474
	%	8.1	0.6	7.2	6.4	7.7	6.7	12.0	15.2	7.8

The demographic characteristics and the characteristics that were significantly associated with the use of FP were considered. The socio-demographic characteristics tested included wealth index, level of education, marital status, and literacy. In all these characteristics, the difference across the different regions was statistically significant as shown in Table 17. The use of modern methods of FP across the regions was statistically significant, X^2 (7, N = 6078) = 60.88, p <.01.

Table 17

Distribution of Adolescents' Socio-demographic Characteristics across regions Chi-square Test Results

The Socio Demographics Characteristic	Chi-square Results
Wealth index	X^2 (7, N = 6078) =347.34, p <.01
Marital status	X^2 (7, N = 6078) =65.09, p <.01
Type of residence	X^2 (7, N = 6078) =395.67, p <.01
Literacy	X^2 (7, N = 6049) =660.31, p <.01
Education level	X^2 (7, N = 6078) =350.60, p <.01
Use of modern method	X^2 (7, N = 6078) =60.88, p <.01

Various characteristics whose association with the use of modern methods of FP that had been shown to be statistically significant at the bivariate level of analysis were tested. The majority of the characteristics tested were shown to be statistically significantly different across the different regions as shown in Table 18. There was statistically significant difference in the distribution of most of the factors that are significantly associated with uptake of FP among the adolescents.

Table 18

Distribution of Adolescents' Various Characteristics Across Regions Chi-Square Test Results

The Characteristic	Chi-square Results
heard political, religious, or community leaders talk favorably at bout FP	X^2 (7, N = 2089) =91.90, p <.001
hearing FP messages in a public forum	X^2 (7, N = 2090) =84.36, p <.001
Seen FP informational materials	X2 (7, N = 2088) =163.86, p <.001
Organizational level having been asked of the FP needs after delivery	X^2 (14, N = 1951) =124.74, *p <.001*
ANC Attendance	X^2 (7, N = 4334) =188.81, =.001
Having delivered in a facility	X^2 (1, N = 880) =46.62, p <.001
visited by a health worker to discuss FP	X^2 (7, N = 2086) =56.59, p =.020
received FP messages through the mobile via text/email	X^2 (7, N = 2090) =17.83, p =013
received FP messages through social media	X2 (7, N = 2090) =39.06, p <.01
Seen FP informational materials	X^2 (7, N = 2862) =114.62, p <.01
visited the health facility	X^2 (7, N = 2090) =154.81, p =.01
At health facility told about FP	X^2 (7, N = 1643) = 46.17, p =.01
visited by a FP worker	X^2 (7, N = 2090) =50.18, p <.01
Heard FP messages through radio	X^2 (7, N = 2090) =351.97, p <.01
heard family FP messages on TV	X^2 (1, N = 2090) = 181.86 p <.01
Seen family FP messages on newspaper/magazine	X^2 (1, N = 2089) = 87.06, p <.01

Distribution of Factors Associated with Family Planning Uptake Among Postpartum Women Across the Regions in Kenya

First the distribution of various characteristics of the postpartum women was analyzed. North eastern (N/E) is leading with the highest proportion of postpartum women being poor (76.7%), followed by the Coast region (65.3%). Nairobi has the lowest percentage of postpartum women in the poor bracket (1.9%), followed by Central at 15.8% and Western at 47.7%. All the other regions have more than 50% of the postpartum women in the poor bracket. The N/E region leads with the highest proportion of residents who cannot read (35.3%) followed by Coast (88.0%). N/E has the lowest education attainment with 95.9% of the postpartum having education level of primary and below, followed by Coast with 84.2%. Nairobi the lowest number of postpartum women with education attainment of primary school and below (36.2%), followed by Central at 46.6% and Nyanza at 66%. N/E has the highest proportion of postpartum women who nan not read (35.3%) followed by Coast at 88.0%. Nairobi has the lowest proportion of postpartum women who cannot read (2.6%) followed by Central at 2.9% and Nyanza at 8.5%. N/E region has the lowest proportion of women using modern FP methods (3.5%) followed by R/V at 29.6% and then Coast at 32.1%. Central leads with 64.1% of postpartum women using modern FP methods followed by Western at 50% and Nairobi at 49.5%.

Table 19

Distribution of Selected Characteristics of Postpartum Women Across the Regions in Kenya

Characteristics		Region								
		Co	N/ E	E	Cent	R/ V	W	Nya	Nai	Total
Wealth index										
poor	Frequency	376	243	379	42	873	189	307	2	2411
	%	65.3	76.7	59.5	15.8	59.5	47.7	53.5	1.9	55.6
Not poor	Frequency	200	74	258	224	594	207	267	103	1927
	%	34.7	23.3	40.5	84.2	40.5	52.3	46.5	98.1	44.4
Marital status										
Never been in union	Frequency	33	0	53	21	165	43	67	10	392
	%	5.7	0.0	8.3	7.9	11.2	10.9	11.7	9.5	9.0
In/have been in union	Frequency	543	317	584	245	1302	353	507	95	3946
	%	94.3	100.0	91.7	92.1	88.8	89.1	88.3	90.5	91.0
Place of residence										
Urban	Frequency	205	118	186	126	418	95	183	105	1436
	%	35.6	37.2	29.2	47.4	28.5	24.0	31.9	100.0	33.1
Rural	Frequency	371	199	451	140	1049	301	391	0	2902
	%	64.4	62.8	70.8	52.6	71.5	76.0	68.1	0.0	66.9
Literacy										
Cannot read	Frequency	202	279	181	7	428	40	48	3	1188
	%	35.3	88.0	28.4	2.6	29.2	10.2	8.5	2.9	27.5
Can read	Frequency	370	38	456	258	1037	354	520	102	3135
	%	64.7	12.0	71.6	97.4	70.8	89.8	91.5	97.1	72.5
Education level										
Primary and below	Frequency	485	304	482	124	1073	266	379	38	3151
	%	84.2	95.9	75.7	46.6	73.1	67.2	66.0	36.2	72.6
Secondary and above	Frequency	91	13	155	142	394	130	195	67	1187
	%	15.8	4.1	24.3	53.4	26.9	32.8	34.0	63.8	27.4
Use of modern method										
Not Using	Frequency	391	306	363	94	1033	198	327	53	2765
	%	67.9	96.5	57.0	35.3	70.4	50.0	57.0	50.5	63.7
Using	Frequency	185	11	274	172	434	198	247	52	1573
	%	32.1	3.5	43.0	64.7	29.6	50.0	43.0	49.5	36.3

Then, to determine if the distribution of the characteristics across the counties in Kenya was statistically significant, bivariate analysis was done using the Chi-square test. The demographic characteristics and the characteristics that were significantly associated with the use of FP were considered. The socio-demographic characteristics tested included wealth index, level of education, marital status and literacy. In all these characteristics, the difference across the different regions was statistically significant as shown in Table 20. The use of modern methods of FP across the regions was statistically significant, X2 (7, N = 4338) =337.17, p <.01.

Table 20

Distribution of Postpartum Women's Sociodemographic Characteristics Across Regions Chi-Square Test Results

The Socio Demographics Characteristic	Chi-square Results
Wealth index	X^2 (7, N = 4338) =396.14, p <.01
Marital status	X^2 (7, N = 4338) =55.18, p <.01
Type of residence	X^2 (7, N = 4338) =274.37, p <.01
Literacy	X^2 (7, N = 4323) =879.51, p <.01
Education level	X^2 (7, N = 4338) =307.55, p <.01
Use of modern method	X^2 (7, N = 4338) =337.17, p <.01

Various characteristics whose association with the use of modern methods of FP that had been shown to be statistically significant at the bivariate level of analysis were tested. The majority of the characteristics tested were shown to be statistically significantly different across the different regions as shown in Table 21.

Table 21

Distribution of Postpartum Women's Various Characteristics Across Regions Chi-Square Test Results

The Characteristic	Chi-square Results
Intrapersonal level	
received FP messages through the mobile via text/email	X^2 (7, N = 2090) =17.83, p =013
received FP messages through social media	X2 (7, N = 2090) =39.06, p <.01
Seen FP informational materials	X2 (7, N = 2088) =163.86, p <.001
Heard FP messages through radio	X2 (7, N = 2090) =351.97, p <.001
Heard FP messages on TV	X2 (1, N = 2090) = 181.86 p <.01
Seen family FP messages on newspaper/magazine	X2 (1, N = 2089) = 87.06, p <.01
Interpersonal level	
Talked to husband on FP	X2 (7, N = 1735) =321.30, p <.001
Having husbands approval to use FP	X^2 (7, N = 1557) =144.68, p <.001
Community level	
heard political, religious, or community leaders talk favorably at bout FP	X^2 (7, N = 2089) =91.90, p <.001
hearing FP messages in a public forum	X^2 (7, N = 2090) =84.36, p <.001
Organizational level	
having been asked of the FP needs after delivery	X^2 (14, N = 1951) =124.74, *p <.001*
visited by a health worker to discuss FP	X^2 (7, N = 2086) =56.59, p =.020
At health facility told about FP	X^2 (7, N = 1634) = 46.17, p =.01
visited by a FP worker	X^2 (7, N = 2089) =50.18, p <.01
(utilization of services) Covariates	
Having taken the infant for DPT	X^2 (1, N = 4210) = 75.71, p <.01
Having taken the infant for PNC	X^2 (1, N = 2084) = 187.12, p <.01
ANC Attendance	X^2 (7, N = 4334) =188.81, =.001
Having delivered in a facility	X^2 (1, N = 4329) =341.08, p <.001
visited the health facility	X^2 (7, N = 2090) =154.81, p =.01

There was statistically significant difference in the distribution of most of the factors that are significantly associated with uptake of FP among the postpartum women. Thus the $H_{o\,3}$ that factors associated with FP uptake among postpartum women and adolescents in Kenya do not differ by counties was rejected.

Summary

Analysis was carried out to answer the three research questions. The results show that there is statistically significant association between the use of FP among adolescents

in Kenya and intrapersonal, interpersonal, community, and organizational factors. Factors at the intrapersonal and organizational level of the SEM contribute most significant to the uptake of F. The adolescents who had seen FP informational materials had higher odds of using FP than those who had not seen, OR = 1.93; 95% CI [1.16, 3.20]. Having seen FP messages on T.V increased the odds of using FP, OR = 1.89; 95% CI [1.12, 3.21], The adolescents who delivered at a facility had increased odds of using FP compared to those who did not, OR = 1.78; 95% CI [1.06, 2.98]. while having been asked of one's FP needs after delivery increased the odds of using FP, OR = 2.04, 95% CI [1.27, 3.28].

For the postpartum women in Kenya, the results showed that there was statistically significant association in the use of FP with intrapersonal, interpersonal, community, and organizational factors. Factors at the intrapersonal and organizational level of the SEM contribute most significantly to the uptake of FP. The most significant factors in the use of FP among the postpartum women were the intrapersonal and interpersonal factors. Having seen FP messages on T.V increased the odds of postpartum women using FP, OR = 1.47, 95% CI [1.05, 2.05]. Having the husband's approval to use FP increased the odds of using, OR = 3.57, 95% CI [2.40, 5.3] while having talked to the husband about FP increased the odds of using OR = 1.67, CI [1.051, 2.659]. The results also revealed that there is statistically significant difference in the regional distribution of various characteristics among the adolescents and postpartum women. This study has provided critical knowledge that will add to the knowledge base on FP particularly in Kenya and the region. This information has the potential to improve the FP programming

among the adolescents and postpartum women. It will also be useful in enhancing equity across the regions in Kenya.

Section 4: Application to Professional Practice and Implications for Social Change

Introduction

With a view to contributing to effective FP programming, this study was conducted to examine the factors that are associated with FP uptake in Kenya among adolescents and postpartum women and to determine the differences in these factors across the regions. FP uptake was the main dependent factor, and various independent factors organized according to the SEM were studied. The 2014 Kenya DHS data were used. This study provides feedback to inform subsequent KDHS questions in FP. It forms a baseline for comparison with future surveys on the status of factors influencing FP uptake across the counties for postpartum women and adolescents.

Key Findings

The use of FP by adolescents is low despite 36.7% of them reporting some sexual activity. There was statistically significant difference in the sociodemographic characteristics between the adolescents and the postpartum women, with adolescents having poorer parameters. The adolescents had a skewed method mix with more than half of them relying on the injectables and only 13.1% using the long acting methods. All the sociodemographic characteristics analyzed were significantly associated with the use of modern methods of FP. There were statistically significant factors that were associated with FP use in all the levels of the SEM on bivariate analysis. Further analysis using the logistic regression model factors at the intrapersonal and organizational level of the SEM contribute most significantly to the uptake of FP.

The postpartum women accounted for 14% of all the respondents, and most (29%) were 20 to 24 years of age. Thirty-six-point three percent were using modern FP methods with a very skewed method mix, with 62.1% of those using modern methods depending on injectables followed by implants at 17%. A higher proportion of the other women were using FP methods compared to the postpartum women, and the difference in use between the two groups was statistically significant; chi-square equals 59.75 with 1 degree of freedom, p is less than 0.01. All the sociodemographic characteristics tested were significantly associated with use of FP. There were statistically significant factors associated with FP use at all the levels of the SEM on bivariate analysis. However, on further analysis using the logistic regression model factors at the intrapersonal and interpersonal level of the SEM contributed most significantly to the uptake of FP.

There was statistically significant difference between sociodemographic characteristics as well as the factors that were associated with use of FP among the adolescents as well as among the postpartum women. The Northeastern region had the lowest use of FP by both adolescents and postpartum women and had the respondents in this region had the worst sociodemographic parameters and other factors. The Coast region had the second worst indicators in almost all aspects. The Central and Nairobi regions, on the other hand, had the best indicators in almost all categories.

Interpretation of the Findings

This study provides a comparison with other studies to either confirm or challenge previous findings. The distribution of the respondents, both adolescents and postpartum women) follows the general population distribution. The larger regions such as the Rift

valley had the most respondents and the regions known to have low population such as the Northeastern had the least numbers, and most of the respondents were from the rural areas. This is due to the sampling being done to be representative nationally.

Adolescents

Sociodemographic Characteristics of Adolescents

There was a statistically significant difference between adolescents and older women in all the demographic characteristics. Though there were more adolescents whose highest level of education was secondary compared to the older women, only 1.6% went beyond secondary school compared to 10.4% of the older women. It may be because the adolescents are still young, and some of them may still be continuing with education compared to older women. There were more adolescents in the poor wealth status than older women. Most adolescents are not yet employed and as noted, they might still be in school. The finding that the adolescents have lower academic achievement and lower wealth status is similar to what Vogel et al. (2015) reported, noting the association between the low socioeconomic status of adolescents and intended pregnancies.

There was also a significant association between education attainment, wealth status, area of residence, marital status, and literacy levels. These findings are similar to what other studies have found. Ochako et al. (2017), Johnson (2017), and Jalang'o et al. (2017) reported an association between the use of FP with being married, higher education level, area of residence, and being employed. However, though Jalang'o et al. reported younger age being associated with FP use, in this study, the older women were more likely to use FP than the adolescents, which could be due to the poorer

socioeconomic characteristics associated with the adolescents. Thus, the findings in this study support the findings that adolescents may be disadvantaged in utilizing FP services, and older women are more likely to use FP (Mutumba et al., 2018). It is therefore critical to empower adolescents in their education and provide opportunities for income generation. In doing so, their capacity to access and use modern methods of FP is enhanced, thus reducing the occurrence of unintended pregnancies and the associated ill effects.

Use of Family Planning Among Adolescents

Only 8.6% report of adolescents were using any form of FP, and 7.8% were using modern methods in this study, which is low compared to 46% for the older women for any method and 42.2 % for modern methods. The low use among adolescents can be partly be attributed to the fact that many adolescents were not sexually active. However, 864 reported being in union, and over 2,000 (36.7%) had had sexual encounters, with a mean age at first sex at 14.5 years. That means that there were still many sexually active adolescents who were not using FP, yet it is unlikely that they were planning to start childbearing at that age. Some adolescents reported being pregnant during the survey with pregnancy that was not planned for. It is notable that the average age at first birth of all respondents was 19.42 years, indicating very high levels of teenage pregnancies.

The most popular method among the adolescents were the injectable methods followed by pills, which was also true for the older women. These results are similar to what other studies have found that the injectables were the most popular among youths and adolescents (Dennis et al., 2017). There has been a concern that this trend may be

influenced by health workers who find it easier to administer the method compared to the other methods (Bertrand et al., 2014). It is known that the longer acting methods are more cost-effective and are less likely to be discontinued (Benson et al., 2017; Keesara et al., 2018; Ochako et al., 2015). The implants and IUDs, though they require a health worker for insertion and removal, are not user dependent, so they are effective at 99% and do not need action around sexual intercourse making them convenient to use (WHO, 2018). In this study, the most discontinued methods by adolescents were short-term methods (injectables and condoms). There is need to understand why the implants and IUDs despite their advantages are not popular among the adolescents. Besides the actual use of FP, the method mix is an important indicator of the quality of care and is related to informed consent which is a right of every woman.

Various factors were given for not using FP such as fear of side effects and health concerns. Fear of side effects and health concerns was cited by both adolescents and older women as reasons for not using FP or and for discontinuation. This is similar to what was reported by Ajong et al. (2016), Nanvubya et al. (2015), and Woog et al. (2015). Besides being common reasons for women and girls not using FP, these reasons are also mentioned as factors in discontinuation. In this study, nearly a quarter of discontinuation was due to method related reasons (side effects, desires for a more effective method and inconvenience use), with side effects leading. This indicates a potentially missed opportunity at the point of offering the methods by the health workers. If appropriate counseling is done, then clients would be aware of the side effects to expect and how to deal with them thus reducing anxiety if side effects occur. In this study

less than half of the adolescents who used modern FP methods reported having been told about side effects. This points to poor counseling and may have contributed to discontinuation. It is critical for health workers to give information in a way that it will be understood by the clients (Woog et al., 2015). Information should also include how other methods work, their effectiveness and their side effects. If this information is communicated in a way that clients understand, there would be little need for clients to switch methods looking for a more effective method.

Adolescents also cited that not being married was a reason for not using FP. These findings are similar to Sieverding et al. (2018) finding that unmarried adolescents did not feel comfortable using FP; they faced social stigma due to the community's view of sexuality. However, the results indicated that many unmarried adolescents are sexually active and are therefore at the risk of unplanned pregnancies. Teenage pregnancies are associated with poor medical and socioeconomic outcomes, hence the need to address the low use of FP methods among adolescents. Given that the adolescents in this study have lower education attainment and lower wealth status compared to the older women, it is critical that unplanned pregnancies do not interfere with the opportunity of the adolescents realizing their potential.

It is also notable that more than 63.2% of adolescents intended to use FP in the future, and 12.5% were not sure whether they would want to use or not and nearly a quarter do not intend to use. This positive future intention to use FP as well as those not sure is an opportunity to provide support and increase uptake of FP as these adolescents mature. It is therefore critical to understand the barriers to FP uptake in order to address

them and enable these willing future users to use FP optimally while encouraging the undecided to make positive informed decisions. Understanding and addressing the reasons why some do not intend to use FP will facilitate those who need FP in this group to change their attitude to be willing to use.

Factors Associated with Use of Family Planning Among Adolescents

The various sociodemographic characteristics tested in this study were statistically significantly associated with the use of modern methods of FP. These characteristics included literacy, education attainment, marital status, area of residence, wealth status, and the mean age at first birth.

Intrapersonal Characteristics

Knowledge is essential in making informed choice on FP. Women need to know of the different methods that exist, availability, and other details that support use. Some studies have reported that there was no association between having knowledge of FP and the use; despite high knowledge the use was low (Durowade et al., 2017; Gbagbo & Nkrumah, 2019). In this study, however, knowledge of a modern method was associated with use of modern method. In the study by Gbagbo and Nkrumah (2019), the emergence contraception was the most common method used unlike in this study where the emergency pill is hardly used. The difference may be due to the different study populations; this study consists of a nationally representative survey unlike the Gbagbo and Nkrumah study that focused on college students who are more likely to have knowledge of and access to the emergency contraception. As it would be expected, none of those who reported not to know of a modern method was using any. These findings are

similar to Shahabuddin et al. (2019), who reported association between knowledge of FP services and use of modern methods. Not knowing about modern methods or of a source was cited as a reason for not using by some adolescents.

The radio was a common method of respondents receiving FP messages followed by the TV at 32% while more than half of the adolescents had heard FP messages though the radio, the newspaper/magazines were less common as sources of FP information. All the three methods were significantly associated with the use of modern FP methods. Having seen informational materials on FP and having seen FP messages on TV remained significant factors in the use of FP even after controlling for other factors. This emphasizes the need for providing FP information and particularly in visual materials.

Other important sources of FP information were FP informational materials, the mobile phone, and their association with using modern methods was statistically significant whereas that of social media was not. It was notable that more of older women received FP messages through the social media and mobile phones than adolescents. This finding is contrary to the common belief that young people are easily reached through technology. It is probable that not many of the adolescent own phones and have access to internet, which could be due to the low socioeconomic status and low academic achievement as noted in this study. This may point to inequity that contributes to poor use of FP methods among this critical group.

Finally, being able to make the decision on whether to use the FP is expected to significantly influence the use as reported in various studies (Shahabuddin et al., 2019; Wegs et al., 2016). However, in this study, making the decision on FP use was not

significantly associated with use of FP among the adolescents. Other factors seemed to have had more importance.

Interpersonal Level

Most of the adolescents using modern methods of FP had talked to their partners on FP (90.1%) and had their partners approve the use (89%). Talking to the partner on FP and having them approve were both associated significantly with use of FP. Husband's opposition and opposition from others including religious prohibition was reported as a reason for discontinuation or for not using a modern method. This finding is similar to what Jalu et al. (2016), Nanvubya et al. (2015), and Ochako et al. (2015) reported, which is that many women relied on their partner to make decisions on FP and may highlight the patriarchal nature of the communities. It also highlights the need to involve the male partners in FP counseling. But FP counseling has largely targeted women, and men rarely get correct and suitable information (Capurchande et al., 2017).

Community Factors

The evaluated community factors in this study included hearing FP messages at public forum and hearing political, religious, or community leaders talk favorably about FP, both of which were associated with use of modern methods.

Organizational Factors

Many organizational factors were found to be significantly associated with use of modern methods. They included being visited by a health worker to discuss FP, being visited by a health worker, being told about a method at the health facility, visiting a health facility, and being asked of their FP needs after the delivery of their last baby.

Even after controlling for other factors, being visited by health worker to discuss FP and being asked about FP needs after delivery remained significant factors in the use of FP methods, thus showing the central role played by health workers involvement in the provision of FP information.

The involvement of health workers in providing information on FP is critical in the provision of informed choice for a modern method. The client needs to be aware of the different methods, how they work, and the side effects. Additionally, any questions they have needs to be answered satisfactorily, which contributes to dealing with the myths and misconceptions. In this study, there were respondents who cited fear of side effects, health concerns including interfering with body processes, and finding methods inconvenient to use as reasons for discontinuation or for not using FP. These fears and misconceptions can be dealt with quality counseling.

Though many of these factors were statistically significant in their association with FP uptake, it is notable that there is need for improvement on the side of the health system. For example, very few respondents were visited by FP health workers in the preceding 12 months and being told about FP at the facility. The proportion was even lower among adolescents. Though the need for spacing is clearly known, less than half of all the respondents were asked of their FP needs after their last delivery and the proportion was less among the adolescents. These are missed opportunities that the health system should focus on for efficient and cost-effective dissemination of correct information o FP.

A small percentage of respondents also cited lack of access or the services being too far as a reason for not using FP methods. While access remains a challenge in some settings, perceptions on the effects of modern methods seem to be a greater concern for most clients.

Utilization of Services (Covariates)

Utilization of related maternal and child health services characteristics was taken as co-variates. The evaluated factors included attending ANC, facility deliveries, delivery by cesarean section, taking infants for PNC, and the first DPT. These factors were significantly associated with using modern FP methods except having delivered by C/S and having taken the baby for PNC. Utilization of these maternal and child health services may be related to the SEM intra-personal level factors, such as knowledge and attitude towards the services. They could also be related to organizational factors such as availability and quality of services, including health worker attitudes. It is also critical to note that these maternal and child health services are usually offered at the same public primary health facilities at no cost to the user in Kenya. In these same facilities, FP services are also offered. That means where mothers were able to access the maternal and child health services; it is most probable that FP services were available. Other factors such as the quality of services, personal and community factors may come into play both for FP utilization and other maternal and child health services.

These findings, therefore, led to the rejection of the hypothesis that intrapersonal, interpersonal, community, and organizational factors are not associated with the uptake

of FP among adolescents in Kenya. They have collaborated on other findings, providing new insights into the factors associated with FP uptake among adolescents.

Postpartum Women

Baseline Descriptive and Demographic Characteristics of the Postpartum Women

The majority of the postpartum women were young, being in the age group 20 to24 years of age. Compared to the other women, the postpartum women had less educational attainment, less wealth, and more of them could read, and the difference in these characteristics was significant statistically. These findings may be related to the younger age of postpartum women compared to older women.

There is a statistically significant association between educational attainment, wealth status, marital status, area of residence and literacy levels, and modern methods of FP. These results are similar to what Pasha et al., 2015 found that socio-demographic characteristics such as education were associated with FP use. The findings are also similar to those reported by Belay et al., 2016 that women with income and those with higher education status are more likely to have higher decision-making power concerning their fertility and are more likely to use FP. Ochako et al. (2015) also found that the area of residence, marital status, and wealth status are associated with uptake of FP. The residence area may affect the access to the FP services, including information, with those living in the rural setting having less access due to various factors (Jalu et al., 2019). The results of this study show that those in urban areas are more likely to use FP. The issues of equity in FP access need to be addressed to ensure all women realize their right to informed choice.

Uptake of Family Planning Among Postpartum Women

More than half of the postpartum women were not using any FP method, indicating a high risk of close births and possibly unmet need for spacing during this critical period during which pregnancy leads to too close spacing (Rossier et al., 2015). As many as 62.8% reported intention of using FP later in this study, indicating their desire to space. In contrast, Pasha et al. (2015) reported that only 5% wanted to have a pregnancy within the first year after delivery. Thus, though many postpartum women are not ready for another pregnancy, they do not use FP to prevent. Some studies have reported more than half of repeat births within an interval that was too short (Keogh et al., 2015; Moore et al., 2015). Some studies have reported that the concept of unwanted pregnancy is not appreciated among married women as it is seen as applying more to unmarried adolescents and young women (Capurchande et al., 2017). Such an attitude could contribute to the low enthusiasm for FP despite the women not desiring a pregnancy. Therefore, it is critical to understand why such women are postponing the use of FP and address any existing barriers.

Those using modern methods mainly use short-acting methods, which are less cost-effective and are more likely to be discontinued. Like other studies have found the injectables were the most commonly used (Dennis et al., 2017). Different reasons, such as limitations in supplies and health workers' skills, provider bias, or community bias, contribute to skewed method mix (Bertrand et al., 2014). Kriel et al. (2019) found that though health workers reported that the best method is the one that fitted the client's lifestyle and medical needs, they still felt that injectables were suitable for all women,

thus indicating bias. Hardee et al. (2014) noted that every woman has a right to make a voluntary informed choice on FP. Having the right method mix is a critical component of quality FP services that support an informed choice of method and enhance FP uptake, as reported in some studies (Amo-Adjei et al., 2017; Silumbwe et al., 2018). Though the LAM has been recognized as an effective modern method when used by postpartum women who are breastfeeding exclusively, are amenorrheic, and within six months of delivery (International Household Survey Network, 2019; Singh et al., 2014). Thus, it is available at no financial cost. Despite the advantages of LAM, only 0.4% of postpartum women were using it in this study. It is critical to understand the barriers that lead to low utilization of LAM. Women's challenge relying on LAM even when they are not protected (have not met the criteria) has been reported in other studies (Rossier et al., 2015). In this study, a few women reported using LAM even though they were not in the postpartum period, highlighting that more within the postpartum period could be using it when they have not met the criteria. Hence the need to ensure postpartum women fully understand when the method protects them. It is a suitable method for women who fear the use of FP for health reasons. It is also suitable for use as the mothers prepare for a more effective method once they no longer meet the LAM criteria (after six months since delivery, if periods return, or stop exclusive breastfeeding).

The majority of those who had discontinued FP's use within the preceding five years had discontinued a short method. This finding is similar to what other studies have found (Benson et al., 2017; Keesara et al., 2018; Ochako et al., 2015). The discontinuation was mainly related to pregnancy (desire to get pregnant or got pregnant),

but nearly a quarter of discontinuations had to do with method related reasons. The method related issues included a desire for a more effective method and inconvenience in use, both of which tend to be associated with short term methods. The longer-acting methods (implants and IUDs) are less likely to be discontinued. Discontinuation is associated with user characteristics and the need for a health worker to remove them (Hubacher et al., 2017). Deliberate efforts to promote longer-acting methods while respecting the choice principle have increased the uptake (Chakraborty et al., 2016; Benson et al., 2017). It is critical to directly target effort in educating women and girls on the advantages of the longer-term methods while providing a full method mix. Targeting adolescents who are at the beginning of their reproductive life is essential. Adolescents are likely to use these methods for the rest of their lives once they adopt them early in life, thus achieving benefits for the users and the health system.

Different Characteristics with Family Planning Among Postpartum Women

Intrapersonal Factors

Among the intrapersonal factors, the knowledge of a modern method was widespread. A good starting point since one has to know a method in order to consider using one. However, knowledge alone does not translate to use, as seen in this study, where knowledge of a method is almost universal, but the use is limited. Like among the adolescents, the radio was the most familiar source of hearing FP messages, followed by the TV. Among the postpartum women, all the sources of FP messages evaluated had a statistically significant association with FP use. These sources included; the radio, TV, newspaper/magazine, informational materials, socio-media, and the mobile phone. These

results are similar to what Prata et al. (2016) found that being exposed to FP information from various sources such as media improved FP use self-efficacy. However, it is notable that the association between having received FP messages through social media and the mobile phone was not significantly associated with FP use among adolescents. The difference between postpartum women and adolescents could be due to limited access by adolescents to technology. Hence, making technology related means not significant ways of receiving FP information.

Fear of side effects and health concerns were cited as reasons for not using FP. These reasons may indicate misconceptions, negative perceptions, and attitudes towards FP, probably due to inadequate information. Ajong et al. (2016) and Nanvubya et al. (2015) reported fear of side effects as a barrier to use of FP Keesara et al. (2018) and Ochako et al. (2015) cited various misconceptions such as contraceptives leading to malformed babies, IUDs penetrate the body, infertility, paralysis, and need for hysterectomy among women. With such misconceptions that associate FP use with serious poor health outcomes, it is not surprising that many women who do not wish to get pregnant still do not use FP. Tailored interventions to understand the specific fears and misconceptions in a community are critical. The resulting information should then be used to inform targeted interventions to deal with the identified barriers.

Interpersonal Factors

When it comes to SEM's interpersonal level, there is a statistically significant association between FP's use and the husband/partner; having talked to him, having his approval, and knowing that the respondents are using FP methods. These findings agree

with what was reported by Ajong et al.,2(016) Durowade et al. (2017) and Prata et al. (2016) that discussion of FP within the couple increases the likelihood of uptake of FP. Bwazi et al. (2014) reported a significant and positive association of the utilization of postpartum FP services when there was the husband's approval of contraception. Having the husband's/partner's approval and talking to them was significant even after controlling for other factors in the regression model. The importance of partners' involvement in FP discussions is critical. Other studies such as the one by Shahabuddin et al. (2019) found that dependency on partners and influence by the partner on decision-making was associated with the FP use. Jalu et al. (2019) described that some women considered it their religious requirement to follow the husband's decision on whether to use FP. Other studies have shown that some partners do not consider it their responsibility to engage in FP discussions yet, they make decisions on whether their wives should use FP or not (Kriel et al., 2019; Withers et al., 2015). These decisions may be based on fears and misconceptions (Adanikin et al., 2017). There is, therefore, a need to continue engaging partners in promoting the use of FP. It is also critical to empower women to engage their partners on FP rather than the partner deciding. The women should tell the husband they desire to use FP, and if it calls for use without involving the partner, they should do that. It has been documented in other studies that women who can engage with their partners are more likely to use FP (Wegs et al., 2016). Other studies have pointed out that empowered women to decisions concerning FP use are more likely to utilize contraceptives (Belay et al., 2016). Given the influence of partners on women's use of FP,

it is critical to empower women to take the right action as concerns the partner and FP use.

Community Factors

Hearing FP messages in a public forum and hearing a leader (political, religious, or other community leaders) talk favorably on FP indicates community acceptance of FP use. SEM's community level is particularly critical in the African setting; women care and consider the community's attitude and perceptions on FP. Other studies have reported similar findings. Shahabuddin et al. 2019 reported in their study found that a supportive community environment was associated with FP use. Wegs et al. (2016) reported that disapproval of FP use by the community members discourages women from using contraception. The findings also support what David & Allan, 2018 found that involving community gatekeepers in promoting FP in a community enhances FP use.

Organizational Level Factors

Organizational level factors are critical in the utilization of FP. Many studies such as those by David and Allan, 2018 and Silumbwe et al. (2018) have looked at physical financial accessibility, which they found to be significant barriers to uptake of FP. However, in this study, few women indicated that they failed to use FP due to cost or lack of access. The organizational level factors that were statically significant in FP's use among the postpartum women in this study were mainly related to interaction with health care providers. These results are similar to what was reported by Kumar et al. (2020) that appropriate interaction between health workers and community members increased not only knowledge of FP but also uptake. Health workers face FP provision challenges and

do not feel fully supported to offer optimal FP services (Lince-Deroche et al., 2020). One of the main challenges that the health system faces is to have the clients get to the facilities. Health workers reaching out to the community is also limited; in this study, less than ten percent of the respondents reported being visited by health workers. Hence when women get to the facility, full advantage should be taken to promote their health. In this study, 78.2% of the postpartum women and 61.6% of other women had visited a health facility in the year preceding the survey. The proportion of the postpartum women who visited a facility is high, but it is not surprising given that majority had facility deliveries and attended ANC within that period. The pregnancy and postpartum period is a suitable time to engage women on the need for contraception. Being told about FP at the facility and being asked about FP needs after delivery were significantly associated with FP use. These findings are in line with what Ochako et al. (2015) and Woog et al. (2015) found that interaction with health workers influences FP uptake. The immediate postpartum period is an appropriate time to counsel the women on FP and even offer the appropriate methods. Given that some of the women will face different challenges in returning for FP services, full advantage should be taken to reach the mothers who deliver in the facility and support them in making informed FP choices. It is best to start counseling during the pregnancy period, and the ANC provides the opportunity. Engagement during ANC gives the client enough time to make informed decisions. Warren et al. (2010) and Bwazi et al. (2014) reported improved FP uptake among postpartum women with close follow-up of women and targeted provision of clear messages. Clients have reported dissatisfaction with the interaction with service provers; they spend much time to get to see the provider,

but very little time is spent in the consultation, limiting the possibility of effective communication of FP (Ajong et al., 2016; Prata et al., 2016). Maximizing benefits for postpartum mothers to enhance their understanding of FP during the interaction with health care providers should be encouraged and promoted.

Another strategy employed to reach women with FP information is visiting them at the community level. Though the visits by health workers or FP workers were low in this study, they were significantly associated with modern methods of FP. The strategy can embrace the provision of methods and information during the health /FP workers' visits. The community-based distribution program has been used but to a limited scale. These results suggest that if this strategy is scaled up, there is a possibility that uptake of FP could improve.

Given that the areas where FP uptake is low are known, a targeted scale is suggested. The advantage of community-based FP services is that it has the capacity to over several barriers concurrently. Provision of correct and consistent information by community members who understand the context enhances the dissemination of correct knowledge and deals with myths and misconceptions. Where methods are provided, access-related barriers are addressed as well.

Covariates (Utilization of Services)

There was a statistically significant association between the use of most maternal and child health services evaluated and FP use. These services included ANC, facility delivery, delivery by C/S, taking the infant for the first DPT, and taking their infants for PNC. These factors, except delivery by C/S, were significant even after controlling for

other factors through regression analysis. Other studies have found an association between the use of various maternal and child health services and FP use. Pasha et al., 2015 reported that facility deliveries were associated with FP use. In Ethiopia, postpartum women who had attended ANC and delivered in a health facility were more likely to use FP (Dagnew et al., 2020). As noted in the section on adolescents, the maternal and child health services are offered in the same primary care facilities or within the same department in major hospitals in Kenya and at no cost to the client. There is, therefore, an excellent opportunity to support mothers utilizing these services to use FP. Many mothers still do not use FP for different reasons, even when accessing these other services. For maximum benefit of the mothers, integration should be enhanced.

Distribution of Factors Associated with Family Planning Uptake Across the Regions in Kenya

This study shows that there is a statistically significant difference across the different regions in the socio-demographic characteristics of the adolescents; these characteristics include wealth index, level of education, marital status, and literacy. The northeastern region has the worst indicators among the adolescents, followed by the coast region with the highest number of the poor, lowest education attainment, and lowest literacy levels. The Central province and Nairobi have the best indicators in these characteristics. On the use of modern methods, Nairobi has the highest proportion of adolescents using, followed by Nyanza and coat regions. The Northeastern region has the lowest use of modern methods by adolescents at 0.6%, while all the other regions are above 6%.

A similar pattern follows the postpartum women, with the Northeastern and Coast regions having the worst socio-demographic parameters while the Central and Nairobi regions have the best. However, in modern methods, Central leads 64.7%, followed by the Western region with 50%, and Nairobi at 49.5%. The northeastern region has the lowest level of modern methods use at 3.5%, with all the other regions being above 30%.

There was a significant difference across the regions in the distribution of all the factors associated with FP use. The differences in the various regions represent inequities that could contribute to FP use. It is notable that the regions with low indicators, such as educational attainment and literacy, also have low FP use. These findings are similar to what was documented by Jalu et al. (2019) and Mutombo et al. (2014) that some areas had low levels of correct FP knowledge with high levels of myths and misconceptions. These findings of disparities across the regions call for more investments in lagging areas to enhance equity.

FP's use also differed significantly across the regions, and so did the majority of the characteristics that are significantly associated with FP use. These differences across the regions may point to underlying inequalities that, in turn, influence the uptake of FP. Socio-demographic characteristics such as wealth, education level, and literacy levels significantly contribute to the utilization of FP services.

Limitations of the Study

One of the study's limitations is that it was a self-reported survey, leading to bias in the responses. The interviewers were trained to explain to the respondents the need to

be as accurate as possible since there was no victimization on the answers' bases, thus reducing the bias. Recall bias is another limitation.

Being a secondary data analysis, it was not possible to tailor questions to capture some aspects that the investigator would have liked to explore. There was a challenge, particularly in capturing some aspects of intrapersonal factors. For example, while there were several questions on the ways respondents received FP messages, there were limited questions to capture the attitudes, perceptions, and beliefs on FP, values, and personality traits. It was also challenging to capture the community's perceptions and attitudes in depth though some proxy indicators were analyzed. Reasons given for discontinuation or for not using FP were used to gain insights into the respondents' perceptions and beliefs.

Another limitation of the study is that though it is the latest DHS, it was done six years ago. A more recent KDHS data would have been desirable to reflect Kenya's current situation better. However, there was none. This secondary analysis is still relevant since the factors contributing to FP use do not change very rapidly. Hence the results are still applicable. This study's findings will be useful as a comparison of the changes that will have taken place once the next DHS is done.

Recommendations

The KDHS provides nationally representative information; however, being a survey, it does not provide an opportunity to test specific interventions. In this regard, based on this study's findings and others, the following recommendations are made. There is a need for implementation research to determine the best way to empower adolescents to address the inequities that disadvantage them to support them make more

informed choices on FP. This study has supported the findings of previous studies that older women have better socioeconomic parameters than adolescents. Better socioeconomic status is associated with FP's better uptake, as documented in this and other cited studies. This study also documented that many sexually active adolescents are not using FP and are, therefore, at high risk of unplanned pregnancies and the related consequences. Significant investment should be made to reach these sexually active unmarried adolescents to empower them to avoid unplanned pregnancies. The disparity regarding technology has been identified and is a concern given the growing role of digital health; therefore, further research among the adolescents is needed to position the adolescents to benefit from technology as digital health interventions increase.

There is a need for further research to understand why implants and IUDs, despite their advantages, are not popular among adolescents and postpartum women. Skewed method mix is an essential indicator of the low quality of care and is related to informed choice, which is every woman's right. This study has shown that the various SEM levels are critical for FP uptake among adolescents and postpartum women. Further implementation research is needed to shed more light on how best to target the different levels concurrently. Research to understand why many postpartum women, though they want to delay pregnancy, are not currently on FP and report the desire to use it later. The existing barriers should be identified and addressed any existing barriers.

Implications for Professional Practice and Social Change

Recommendations for Professional Practice

Health workers play an essential role in influencing FP uptake through their interaction with clients. This study's findings point to the importance of positive interaction of health workers with the clients, including provider-initiated health information. There is an urgent need to urgently address the missed opportunities that continue to occur in our facilities; potential beneficiaries of FP do not get information at every contact with health workers. Some contacts such as ANC and delivery are particularly suitable for FP information sharing and should be utilized fully. Health workers need to target specific FP uptake barriers such as unfounded fears of side effects and health effects of FP.

Many respondents, particularly the postpartum women, desire to use FP later, despite their current need; there is a need for deliberate effort to reach them. There are still missed opportunities that should be utilized to reach more clients who contact health workers.

There is a need to continue reaching out to communities with the right information since the community members, particularly the male partners and opinion leaders (community leaders), are an important influence to both the adolescents and postpartum women in FP uptake.

In line with the findings of this study (and other studies) on the contribution of different SEM levels to FP uptake, FP program implementers and policymakers need to target more than one level of the SEM when implementing FP programs.

Kenya Demographic and Health Survey Methodological Implications

The DHS studies should consider adding more questions to capture women's perceptions and attitudes and those of the community in general concerning FP.

Theoretical and Empirical Implications

In line with the findings of this study (and other studies) on the contribution of different SEM levels to FP uptake, FP program implementers and policymakers need to target more than one level of the SEM when implementing FP programs.

This study adds to the body of evidence that supports the proposition that the interaction with the environment influences behavior, and the influence is at the different levels described by the SEM. Interventions to improve FP uptake should take into consideration the different levels of influence.

Positive Social Change

This study gives recommendations on areas of research that could potentially improve the uptake of FP by adolescents. With the implementation of the recommendations, modern FP methods are expected to increase among adolescents, thus reducing unintended pregnancies and the associated ill effects. When adolescents avoid unintended pregnancies, their chance of continuing with education is improved. Education empowers adolescents to have better economic opportunities and make better decisions in many aspects of life. Empowered adolescents have a better quality of life, which means positive social change for adolescents and the community at large. Reduced unintended pregnancies, particularly among adolescents, lead to improving health outcomes for the adolescents, thus enhancing positive outcomes for the adolescents and

the society at large and, hence, positive social change. Reduced unintended pregnancies lead to economic savings, thus availing funds to be invested in the economy resulting in positive social change. Implementation of these recommendations will enhance universal access to FP and equity and thus contribute to achieving sustainable development goals three (Ensure healthy lives and promote well-being for all ages) and five (Achieve gender equality and empower all women and girls).

Conclusion

This study assessed the factors associated with the uptake of FP among adolescents and postpartum women in Kenya. This study shows that all the SEM model levels have a contribution to the uptake of FP. However, the contribution in each level and across the levels varies. There is significant regional variation in FP uptake and many of the factors associated with the uptake of FP. Therefore, it is critical to have tailored research and program implementation interventions targeting different SEM levels to support informed FP method choice. Special effort should be put into investing in adolescents and the regions that are lagging in FP uptake and associated factors to ensure equity, which is the right of every Kenyan.

References

Adanikin, A. I., McGrath, N., & Padmadas, S. S. (2017). Impact of men's perception on family planning demand and uptake in Nigeria. *Sexual & Reproductive Healthcare*, *14*, 55–63. https://doi.org/10.1016/j.srhc.2017.10.002

Ahmed, S., Li, Q., Liu, L., & Tsui, A. O. (2012). Maternal deaths averted by contraceptive use: An analysis of 172 countries. *The Lancet*, *380*(9837), 111–125. https://doi.org/10.1016/S0140-6736(12)60478-4

Ajong, A. B., Njotang, P. N., Yakum, M. N., Essi, M. J., Essiben, F., Eko, F. E., Kenfack, B., & Mbu, E. R. (2016). Determinants of unmet need for family planning among women in Urban Cameroon: A cross sectional survey in the Biyem-Assi Health District, Yaounde. *BMC Women's Health; London*, *16*. https://doi.org/10.1186/s12905-016-0283-9

Amo-Adjei, J., Mutua, M., Athero, S., Izugbara, C., & Ezeh, A. (2017). Improving family planning services delivery and uptake: Experiences from the "Reversing the Stall in Fertility Decline in Western Kenya Project." *BMC Research Notes*, *10*(1), 498. https://doi.org/10.1186/s13104-017-2821-4

Benson, A., Calhoun, L. M., Corroon, M., Lance, P., O'Hara, R., Otsola, J., Speizer, I. S., & Winston, J. (2017). Longitudinal evaluation of the Tupange Urban Family Planning Program in Kenya. *International Perspectives on Sexual and Reproductive Health; New York*, *43*(2), 75–87. https://doi.org/10.1363/43e4117

Bertrand, J. T., Sullivan, T. M., Knowles, E. A., Zeeshan, M. F., & Shelton, J. D. (2014). Contraceptive method skew and shifts in method mix in low- and middle-income

countries. *International Perspectives on Sexual and Reproductive Health*, *40*(03), 144–153. https://doi.org/10.1363/4014414

Bishwajit, G., Tang, S., Yaya, S., & Feng, Z. (2017). Unmet need for contraception and its association with unintended pregnancy in Bangladesh. *BMC Pregnancy and Childbirth*, *17*(1), 186. https://doi.org/10.1186/s12884-017-1379-4

Boo, S., & Froelicher, E. S. (2013). Secondary analysis of national survey datasets: Secondary analysis of survey data. *Japan Journal of Nursing Science*, *10*(1), 130–135. https://doi.org/10.1111/j.1742-7924.2012.00213.x

Bronfenbrenner, U. (1977). *Toward an Experimental Ecology.pdf*. *American Psychologist*. 32:513-31. http://garfield.library.upenn.edu/classics1983/A1983QW37000001.pdf

Brown, W., Ahmed, S., Roche, N., Sonneveldt, E., & Darmstadt, G. L. (2015). Impact of family planning programs in reducing high-risk births due to younger and older maternal age, short birth intervals, and high parity. *Seminars in Perinatology*, *39*(5), 338–344. https://doi.org/10.1053/j.semperi.2015.06.006

Bwazi, C., Maluwa, A., Chimwaza, A., & Pindani, M. (2014). Utilization of postpartum family planning services between six and twelve months of delivery at Ntchisi District Hospital, Malawi. *Health*, *06*(14), 1724–1737. https://doi.org/10.4236/health.2014.614205

Cahill, N., Sonneveldt, E., Stover, J., Weinberger, M., Williamson, J., Wei, C., Brown, W., & Alkema, L. (2018). Modern contraceptive use, unmet need, and demand satisfied among women of reproductive age who are married or in a union in the

focus countries of the Family Planning 2020 initiative: A systematic analysis using the family planning estimation tool. *The Lancet*, *391*(10123), 870–882. https://doi.org/10.1016/S0140-6736(17)33104-5

Canning, D., & Schultz, T. P. (2012). The economic consequences of reproductive health and family planning. *The Lancet*, *380*(9837), 165–171. https://doi.org/10.1016/S0140-6736(12)60827-7

Capurchande, R., Coene, G., Roelens, K., & Meulemans, H. (2017). "If I have only two children and they die who will take care of me?" -a qualitative study exploring knowledge, attitudes and practices about family planning among Mozambican female and male adults. *BMC Women's Health; London*, *17*. https://doi.org/10.1186/s12905-017-0419-6

Chandra-Mouli, V., McCarraher, D. R., Phillips, S. J., Williamson, N. E., & Hainsworth, G. (2014). Contraception for adolescents in low and middle income countries: Needs, barriers, and access. *Reproductive Health*, *11*(1), 1. https://doi.org/10.1186/1742-4755-11-1

Choi, Y., Short Fabic, M., Hounton, S., & Koroma, D. (2015). Meeting demand for family planning within a generation. *Global Health Action*, *8*(1), 29734. https://doi.org/10.3402/gha.v8.29734

CIA World Factbook. (2019). *Kenya demographics profile 2019.* https://www.indexmundi.com/kenya/demographics_profile.html

Cleland, J., Bernstein, S., Faundes, A., Glasier, A., & Innis, J. (2006). Family planning: The unfinished agenda. *The Lancet*, *368*(9549), 1810–1827.

https://doi.org/10.1016/S0140-6736(06)69480-4

Creswell, J. W., & Creswell, J. (2017). *Research design qualitative, quantitative, and mixed methods approaches: Vol. 5th Edition*. SAGE Publications, Inc.

Crichton, J. (2008). Changing fortunes: Analysis of fluctuating policy space for family planning in Kenya. *Health Policy and Planning*, *23*(5), 339–350. https://doi.org/10.1093/heapol/czn020

Dagnew, G.W., Asresie, M.B., Fekadu, G.A., & Gelaw. Y.M. (2020). Modern contraceptive use and factors associated with use among postpartum women in Ethiopia; Further analysis of the 2016 Ethiopia Demographic and Health Survey data. *BMC Public Health*, *20*(1), 661. https://doi.org/10.1186/s12889-020-08802-6

David, S., & Allan, C. (2018). Midwives influencing community acceptance of family planning to reduce maternal mortality rates in remote villages of Papua New Guinea where men are the gatekeepers. *Women and Birth*, *31*, S52. https://doi.org/10.1016/j.wombi.2018.08.154

Dennis, M. L., Radovich, E., Wong, K. L. M., Owolabi, O., Cavallaro, F. L., Mbizvo, M. T., Binagwaho, A., Waiswa, P., Lynch, C. A., & Benova, L. (2017). Pathways to increased coverage: An analysis of time trends in contraceptive need and use among adolescents and young women in Kenya, Rwanda, Tanzania, and Uganda. *Reproductive Health*, *14*(1), 130. https://doi.org/10.1186/s12978-017-0393-3

DHS Program. (2019). *DHS model questionnaires*. https://dhsprogram.com/publications/publication-DHSQ8-DHS-Questionnaires-

and-Manuals.cfm

Do, M., & Hotchkiss, D. (2013). Relationships between antenatal and postnatal care and postpartum modern contraceptive use: Evidence from population surveys in Kenya and Zambia. *BMC Health Services Research*, *13*(1), 6. https://doi.org/10.1186/1472-6963-13-6

Durowade, K. A., Omokanye, L. O., Elegbede, O. E., Adetokunbo, S., Olomofe, C.O., Ajiboye, A. D., Adeniyi, M. A., & Sanni T. A. (2017). Barriers to contraceptive uptake among women of reproductive age in a semi-urban community of Ekiti State, Southwest Nigeria. *Ethiopian Journal of Health Sciences*, *27*(2), 121. https://doi.org/10.4314/ejhs.v27i2.4

Frost, J. J., Sonfield, A., Zolna, M. R., & Finer, L. B. (2014). Return on investment: A fuller assessment of the benefits and cost savings of the US publicly funded family planning program. *Milbank Quarterly*, *92*(4), 696–749. https://doi.org/10.1111/1468-0009.12080

Ganatra, B., & Faundes, A. (2016). Role of birth spacing, family planning services, safe abortion services and post-abortion care in reducing maternal mortality. *Best Practice & Research Clinical Obstetrics & Gynaecology*, *36*, 145–155. https://doi.org/10.1016/j.bpobgyn.2016.07.008

Gbagbo, F. Y., & Nkrumah, J. (2019). Family planning among undergraduate university students: A CASE study of a public university in Ghana. *BMC Women's Health; London*, *19*. http://doi.org/10.1186/s12905-019-0708-3

Glasier, A., Gülmezoglu, A. M., Schmid, G. P., & Moreno, C. G. (2006). Sexual and

reproductive health 1 sexual and reproductive health: A matter of life and death. *The Lancet 368*, (14),1595-1607. https://www.who.int/reproductivehealth/publications/general/lancet_1.pdf.

Gueye, A., Speizer, I. S., Corroon, M., & Okigbo, C. C. (2015). Belief in family planning myths at the individual and Community levels and modern contraceptive use in urban Africa. *International Perspectives on Sexual and Reproductive Health, 41*(04), 191–199. https://doi.org/10.1363/4119115

Hardee, K., Harris, S., Rodriguez, M., Kumar, J., Bakamjian, L., Newman, K., & Brown, W. (2014). Achieving the goal of the London summit on family planning by adhering to voluntary, rights-based family planning: What can we learn from past experiences with coercion? *International Perspectives on Sexual and Reproductive Health, 40*(04), 206–214. https://doi.org/10.1363/4020614

Hardee, K., Kumar, J., Newman, K., Bakamjian, L., Harris, S., Rodríguez, M., & Brown, W. (2014). Voluntary, human rights–based family planning: A conceptual framework. *Studies in Family Planning, 45*(1), 1–18. https://doi.org/10.1111/j.1728-4465.2014.00373.x

Harrington, E. K., Dworkin, S., Withers, M., Onono, M., Kwena, Z., & Newmann, S. J. (2016). Gendered power dynamics and women's negotiation of family planning in a high HIV prevalence setting: A qualitative study of couples in western Kenya. *Culture, Health & Sexuality*, *18*(4), 453–469. https://doi.org/10.1080/13691058.2015.1091507

Hubacher, D., Spector, H., Monteith, C., Chen, P.-L., & Hart, C. (2017). Long-acting

reversible contraceptive acceptability and unintended pregnancy among women presenting for short-acting methods: A randomized patient preference trial. *American Journal of Obstetrics and Gynecology*, *216*(2), 101–109. https://doi.org/10.1016/j.ajog.2016.08.033

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

ICF International. (n.d.). *The Demographic and Health Surveys.*

International Household Survey Network. (2019). *Demographic and Health Surveys. IHSN.docx*. http://www.measuredhs.com/

Jain, A. K., & Winfrey, W. (2017). Contribution of contraceptive discontinuation to unintended births in 36 developing countries. *Studies in Family Planning*, *48* (3) 269 - 278. DOI 10.1111/sifp.12023

Jalang'o, R., Thuita, F., Barasa, S. O., & Njoroge, P. (2017). Determinants of contraceptive use among postpartum women in a county hospital in rural KENYA. *BMC Public Health*, *17*(1), 604. https://doi.org/10.1186/s12889-017-4510-6

Jalu, M. T., Ahmed, A., Hashi, A., & Tekilu, A. (2019). Exploring barriers to reproductive, maternal, child and neonatal health-seeking behaviors in Somali region, Ethiopia. *PLOS ONE*, *14*(3), e0212227. https://doi.org/10.1371/journal.pone.0212227

Johnson, O. E. (2017). Determinants of modern contraceptive uptake among Nigerian

women: Evidence from the national demographic and health survey. *African Journal of Reproductive Health, 21*(3), 89–95. https://doi.org/10.29063/ajrh2017/v21i3.8

Kaliyadan, F., & Kulkarni, V. (2019). Types of variables, descriptive statistics, and sample size. *Indian dermatology online journal*, 10(1), 82–86. https://doi.org/10.4103/idoj.IDOJ_468_18

Keesara, S., Juma, P. A., Harper, C. C., & Newmann, S. J. (2018). Barriers to postpartum contraception: Differences among women based on parity and future fertility desires. *Culture, Health & Sexuality*, *20*(3), 247–261. https://doi.org/10.1080/13691058.2017.1340669

Kennedy, E., Gray, N., Azzopardi, P., & Creati, M. (2011). Adolescent fertility and family planning in East Asia and the Pacific: A review of DHS reports. *Reproductive Health, 8*(1), 11. https://doi.org/10.1186/1742-4755-8-11

Kenya National Bureau of Statistics. (n.d.). *Population by Sex and Age Groups—Census report Volume 1c*. https://knbs.or.ke/visualizations/?page_id=3126

Kenya National Bureau of Statistics. (2015). *Kenya Demographic and Health Survey 2014.pdf*. https://dhsprogram.com/pubs/pdf/fr308/fr308.pdf

Kenya National Bureau of Statistics. (2018). Basic report on well-being in Kenya: Based on the 2015/16 Kenya Integrated Household Budget Survey (KIHBS). https://www.google.com/search?q=Basic+Report+on+Well-Being+in+Kenya&rlz=1C1GCEU_enKE887KE887&oq=Basic+Report+on+Well Being+in+Kenya&aqs=chrome..69i57.396370937j0j0&sourceid=chrome&ie=UT

F-8

Kenya National Bureau of statistics. (2019). Kenya population and housing census results. https://www.knbs.or.ke/?p=5621

Keogh, S. C., Urassa, M., Kumogola, Y., Kalongoji, S., Kimaro, D., & Zaba, B. (2015). Postpartum Contraception in Northern Tanzania: Patterns of use, relationship to antenatal intentions, and impact of antenatal counseling. *Studies in Family Planning*, *46*(4), 405–422. https://doi.org/10.1111/j.1728-4465.2015.00040.x

Kissoon, N., Dugani, S., & Bhutta, Z. A. (2015). Maternal and child health: Gains, but a long journey ahead. *Canadian Medical Association Journal*, *187*(16), E471–E472. https://doi.org/10.1503/cmaj.150725

Koffi, T. B., Weidert, K., Ouro Bitasse, E., Mensah, M. A. E., Emina, J., Mensah, S., Bongiovanni, A., & Prata, N. (2018). Engaging men in family planning: perspectives from married men in Lomé, Togo. *Global Health: Science and Practice*, *6*(2), 317–329. https://doi.org/10.9745/GHSP-D-17-00471

Kriel, Y., Milford, C., Cordero, J., Suleman, F., Beksinska, M, Steyn, P., & Smit. J.A. (2019). "Male partner influence on family planning and contraceptive use: Perspectives from community members and healthcare providers in KwaZulu-Natal, South Africa." *Reproductive Health* 16(1):89. doi: 10.1186/s12978-019-0749-y.

Kumar, A., Jain, A.K., Ram, F., Acharya, R., Shukla, A., Mozumdar,A., & Saggurti,N. (2020). "Health workers' outreach and intention to use contraceptives among married women in India." *BMC Public Health* 20(1):1041. doi: 10.1186/s12889-

020-09061-1.

Lince-Deroche, N., Hendrickson, C., Moolla, A., Kgowedi, S., & Mulongo. M. (2020). "Provider perspectives on contraceptive service delivery: Findings from a qualitative study in Johannesburg, South Africa." *BMC Health Services Research* 20(1):128. doi: 10.1186/s12913-020-4900-9.

Li, Q., Louis, T. A., Liu, L., Wang, C., & Tsui, A. O. (2019). Subnational estimation of modern contraceptive prevalence in five sub-Saharan African countries: A Bayesian hierarchical approach. *BMC Public Health*, *19*(1), 216. https://doi.org/10.1186/s12889-019-6545-3

Loaiza, E., & Liang, M. (2013). *Adolescent pregnancy_UNFPA.pdf*. https://www.unfpa.org/sites/default/files/pubpdf/ADOLESCENT%20PREGNANCY_UNFPA.pdf

McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Education Quarterly*, *15*(4), 351–377. https://doi.org/10.1177/109019818801500401

Meiksin, R., Meekers, D., Thompson, S., Hagopian, A., & Mercer, M. A. (2015). Domestic violence, marital control, and family planning, maternal, and birth outcomes in Timor-Leste. *Maternal and Child Health Journal*, *19*(6), 1338–1347. https://doi.org/10.1007/s10995-014-1638-1

Moore, Z., Pfitzer, A., Gubin, R., Charurat, E., Elliott, L., & Croft, T. (2015). Missed opportunities for family planning: An analysis of pregnancy risk and contraceptive method use among postpartum women in 21 low- and middle-

income countries. *Contraception*, *92*(1), 31–39. https://doi.org/10.1016/j.contraception.2015.03.007

Mumah, J. N., Machiyama, K., Mutua, M., Kabiru, C. W., & Cleland, J. (2015). Contraceptive adoption, discontinuation, and switching among postpartum women in Nairobi's urban slums. *Studies in Family Planning*, *46*(4), 369–386. https://doi.org/10.1111/j.1728-4465.2015.00038.x

Mutombo, N., Bakibinga, P., Mukiira, C., & Kamande, E. (2014). Benefits of family planning: An assessment of women's knowledge in rural Western Kenya. *BMJ Open*, *4*(3), e004643. https://doi.org/10.1136/bmjopen-2013-004643

Mutumba, M., Wekesa, E., & Stephenson, R. (2018). Community influences on modern contraceptive use among young women in low and middle-income countries: A cross-sectional multi-country analysis. *BMC Public Health*, *18*(1), 430. https://doi.org/10.1186/s12889-018-5331-y

Mwaikambo, L., Speizer, I. S., Schurmann, A., Morgan, G., & Fikree, F. (2011). What works in family planning interventions: A systematic review. *Studies in Family Planning*, *42*(2), 67–82. https://doi.org/10.1111/j.1728-4465.2011.00267.x

Nanvubya, A., Ssempiira, J., Mpendo, J., Ssetaala, A., Nalutaaya, A., Wambuzi, M., Kitandwe, P., Bagaya, B. S., Welsh, S., Asiimwe, S., Nielsen, L., Makumbi, F., & Kiwanuka, N. (2015). Use of modern family planning methods in fishing communities of Lake Victoria, Uganda. *PLOS ONE*, *10*(10), e0141531. https://doi.org/10.1371/journal.pone.0141531

National Institute of Health. (2005). *Theory at a Glance.pdf*. NIH Publication No. 05-

3896; Second Edition.

Ndugwa, R. P., Cleland, J., Madise, N. J., Fotso, J.-C., & Zulu, E. M. (2011). Menstrual pattern, sexual behaviors, and contraceptive use among postpartum women in Nairobi urban slums. *Journal of Urban Health*, *88*(S2), 341–355. https://doi.org/10.1007/s11524-010-9452-6

Neal, J. W., & Neal, Z. P. (2013). Nested or networked? Future directions for ecological systems theory: *Social Development*, n/a-n/a. https://doi.org/10.1111/sode.12018

Nove, A., Matthews, Z., Neal, S., & Camacho, A. V. (2014). Maternal mortality in adolescents compared with women of other ages: Evidence from 144 countries. *The Lancet Global Health*, *2*(3), e155–e164. https://doi.org/10.1016/S2214-109X(13)70179-7

Ochako, R., Mbondo, M., Aloo, S., Kaimenyi, S., Thompson, R., Temmerman, M., & Kays, M. (2015). Barriers to modern contraceptive methods uptake among young women in Kenya: A qualitative study. *BMC Public Health*, *15*(1), 118. https://doi.org/10.1186/s12889-015-1483-1

Ochako, R., Temmerman, M., Mbondo, M., & Askew, I. (2017). Determinants of modern contraceptive use among sexually active men in Kenya. *Reproductive Health*, *14*(1), 56. https://doi.org/10.1186/s12978-017-0316-3

OlaOlorun, F. M., & Hindin, M. J. (2014). Having a say matters: Influence of decision-making power on contraceptive use among Nigerian women ages 35–49 years. *PLoS ONE*, *9*(6), e98702. https://doi.org/10.1371/journal.pone.0098702

Pallone, S. R., & Bergus, G. R. (2009). Fertility awareness-based methods: Another

option for family planning. *The Journal of the American Board of Family Medicine*, *22*(2), 147–157. https://doi.org/10.3122/jabfm.2009.02.080038

Pasha, O., Goudar, S. S., Patel, A., Garces, A., Esamai, F., Chomba, E., Moore, J. L., Kodkany, B. S., Saleem, S., Derman, R. J., Liechty, E. A., Hibberd, P. L., Hambidge, K. M., Krebs, N. F., Carlo, W. A., McClure, E. M., Koso-Thomas, M., & Goldenberg, R. L. (2015). Postpartum contraceptive use and unmet need for family planning in five low-income countries. *Reproductive Health*, *12*(S2), S11. https://doi.org/10.1186/1742-4755-12-S2-S11

Patton, G. C., Sawyer, S. M., Santelli, J. S., Ross, D. A., Afifi, R., Allen, N. B., Arora, M., Azzopardi, P., Baldwin, W., Bonell, C., Kakuma, R., Kennedy, E., Mahon, J., McGovern, T., Mokdad, A. H., Patel, V., Petroni, S., Reavley, N., Taiwo, K., & Viner, R. M. (2016). Our future: A Lancet commission on adolescent health and wellbeing. *The Lancet*, *387*(10036), 2423–2478. https://doi.org/10.1016/S0140-6736(16)00579-1

Peterson, H. B., Darmstadt, G. L., & Bongaarts, J. (2013). Meeting the unmet need for family planning: Now is the time. *The Lancet*, *381*(9879), 1696–1699. https://doi.org/10.1016/S0140-6736(13)60999-X

PopulationPyramid,net. (n.d.). Population Pyramids of the World from 1950 to 2100. *PopulationPyramid.Net.* https://www.populationpyramid.net/kenya/2019/

Prata, N., Bell, S., Weidert, K., Nieto-Andrade, B., Carvahlo, A., & Neves, I. (2016). Varying family planning strategies across age categories: Differences in factors associated with current modern contraceptive use among youth and adult women

in Luanda, Angola. *Open Access Journal of Contraception; Macclesfield*, *7*, 1–9. http://dx.doi.org.ezp.waldenulibrary.org/10.2147/OAJC.S93794

Rossier, C., Bradley, S. E. K., Ross, J., & Winfrey, W. (2015). Reassessing unmet need for family planning in the postpartum period. *Studies in Family Planning*, *46*(4), 355–367. https://doi.org/10.1111/j.1728-4465.2015.00037.x

Sallis JF, Owen N, Fisher EB. Ecological models of health behavior. In: Glanz K, Rimer BK, Viswanath K, eds. (2008). Health behavior and health education. 4th ed. San Francisco: John Wiley & Sons;465–485.

Shahabuddin, A., Delvaux, T., Nöstlinger, C., Sarker, M., Bardají, A., Sharkey, A., Adhikari, R., Koirala, S., Rahman, M. A., Mridha, T., Broerse, J. E. W., & De Brouwere, V. (2019). Maternal health care-seeking behaviour of married adolescent girls: A prospective qualitative study in Banke District, Nepal. *PLOS ONE*, *14*(6), e0217968. https://doi.org/10.1371/journal.pone.0217968

Sibanda, A. (2010). Reproductive change in Zimbabwe and Kenya: The role of the proximate determinants in recent fertility trends. *Social Biology 46*:1-2, 82-99, DOI: 10.1080/19485565.1999.9988989

Sieverding, Schatzkin, Shen, & Liu. (2018). Bias in contraceptive provision to young women among private health care providers in South West Nigeria. *International Perspectives on Sexual and Reproductive Health*, *44*(1), 19. https://doi.org/10.1363/44e5418

Silumbwe, A., Nkole, T., Munakampe, M. N., Milford, C., Cordero, J. P., Kriel, Y., Zulu, J. M., & Steyn, P. S. (2018). Community and health systems barriers and enablers

to family planning and contraceptive services provision and use in Kabwe District, Zambia. *BMC Health Services Research, 18*(1), 390. https://doi.org/10.1186/s12913-018-3136-4

Sindiga, I. (1985). The persistence of high fertility in Kenya. *Social Science & Medicine, 20*(1):71-84. doi: 10.1016/0277-9536(85)90314-4.

Singh, S., Darroch, J. E., & Ashford, L. S. (2014). Adding It Up: The Costs and Benefits of Investing in Sexual and Reproductive Health. *Guttmacher Institute and United Nations Population Fund.* https://www.guttmacher.org/sites/default/files/report_pdf/addingitup2014.pdf

Sonalkar, S., Mody, S., Phillips, S., & Gaffield, M. E. (2013). *Programmatic aspects of postpartum family planning in developing countries: A qualitative analysis of key informant interviews in Kenya and Ethiopia*. 4. *Africa Journal of Reproductive Health 17*(3): 54-56 https://www.ajol.info/index.php/ajrh/article/view/93747

Speizer, I. S., Corroon, M., Calhoun, L. M., Gueye, A., & Guilkey, D. K. (2018). Association of men's exposure to family planning programming and reported discussion with partner and family planning use: The case of urban Senegal. *PLOS ONE, 13*(9), e0204049. https://doi.org/10.1371/journal.pone.0204049

Stiegler, N., & Susuman, A. S. (2016). A comparative analysis of contraceptive use in africa: Evidence from dhs. *Journal of Asian and African Studies, 51*(4), 416–432. https://doi.org/10.1177/0021909614547462

Suresh, K., & Chandrashekara, S. (2012). Sample size estimation and power analysis for clinical research studies. *Journal of Human Reproductive Sciences, 5*(1), 7.

https://doi.org/10.4103/0974-1208.97779

United Nations. (2017). World Family Planning 2017_Highlights. un.org/en/development/desa/population/publications/pdf/family/WFP2017_Highlights.pdf

United Nations, (2013). World contraceptive patterns 2013. Department of economic and social affairs, &population division. https://www.un.org/en/development/desa/population/publications/family/contraceptive-wallchart-2013.asp

Vogel, J. P., Pileggi-Castro, C., Chandra-Mouli, V., Pileggi, V. N., Souza, J. P., Chou, D., & Say, L. (2015). Millennium Development Goal 5 and adolescents: Looking back, moving forward. *Archives of Disease in Childhood*, *100*(1), S43–S47. https://doi.org/10.1136/archdischild-2013-305514

Warren, C., Mwangi, A., Oweya, E., Kamunya, R., & Koskei, N. (2010). Safeguarding maternal and newborn health: Improving the quality of postnatal care in Kenya. *International Journal for Quality in Health Care*, *22*(1), 24–30. https://doi.org/10.1093/intqhc/mzp050

Wegs, C., Creanga, A. A., Galavotti, C., & Wamalwa, E. (2016). Community dialogue to shift social norms and enable family planning: An evaluation of the family planning results initiative in Kenya. *PLOS ONE*, *11*(4), e0153907. https://doi.org/10.1371/journal.pone.0153907

Westoff, C. F., & Cross, A. R. (2006). The stall in the fertility transition in Kenya. DHS analytical studies 9. https://dhsprogram.com/pubs/pdf/AS9/AS9.pdf

Withers, M., Dworkin, S. L., Zakaras, J. M., Onono, M., Oyier, B., Cohen, C. R., Bukusi, E. A., Grossman, D., & Newmann, S. J. (2015). 'Women now wear trousers': Men's perceptions of family planning in the context of changing gender relations in western Kenya. *Culture, Health & Sexuality*, *17*(9), 1132–1146. https://doi.org/10.1080/13691058.2015.1043144

Woog, V., Singh, S., Browne, A., & Philbin, J. (2015). Adolescent women's need for and use of sexual and reproductive health services in developing countries. 63. Guttmacher Institute. https://www.researchgate.net/profile/Susheela_Singh/publication/283212654_Adolescent_Women's_Need_for_and_Use_of_Sexual_and_Reproductive_Health_Services_in_Developing_Countries/links/562e2a7f08ae04c2aeb59100.pdf

World Health Organization. (2010). WHO Technical consultation on postpartum and postnatal care. https://www.ncbi.nlm.nih.gov/books/NBK310595/

World Health Organization. (2013). Programming Strategies for postpartum family planning.pdf. https://apps.who.int/iris/bitstream/handle/10665/93680/9789241506496_eng.pdf?sequence=1

World Health Organization. (2018). Family planning/Contraception. https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception

Zakiyah, N., Asselt, A. D. I. van, Roijmans, F., & Postma, M. J. (2016). Economic evaluation of family planning interventions in low and middle income countries; A systematic review. *PLoS One; San Francisco*, *11*(12), e0168447.

http://dx.doi.org.ezp.waldenulibrary.org/10.1371/journal.pone.0168447