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Factors Influencing Contraceptive Use Among Married Women in Four Regional States of Ethiopia

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Factors Influencing Contraceptive Use Among Married Women in Four Regional States of Ethiopia

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An abstract of
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ABSTRACT

Factors Influencing Contraceptive Use Among Married Women in Four Regional States of Ethiopia

By

Metasebia Gizaw Balcha

Background: Contraceptive use among married women in Ethiopia is at its highest since the country's family planning program started in 1966. However, the contraceptive needs of one in four sexually active women that want to delay or stop child bearing are not yet met. Married women's contraceptive use is influenced by sociodemographic, pregnancy and fertility related factors. The degree of influence of these factors on contraceptive use has not been consistent. This study assessed factors associated with contraceptive use in Ethiopia.

Methods: The study used family planning data from the Last 10 Kilometers project survey conducted in December 2014 -January 2015. Data were collected from 3,988 women 15-49 years of age in selected 324 kebeles in four regions of Ethiopia. Women of reproductive age that were current users of contraceptives were compared with non-users across demographic, pregnancy and family planning related characteristics using logistic regression in bivariate and multivariate analysis. Analysis was conducted in Stata v14 applying survey commands to account for the complex sample design.

Results: The proportion of women that used contraceptives in the study was 67 percent. Several factors were significantly associated with increased contraceptive use among women of reproductive age including couples that discussed family planning 6 months prior to the survey (OR = 6.75); residing in Oromia (OR = 4.20) or SNNP region (OR = 2.36); women that approved contraceptive use (OR = 3.91); and having 1-3 living children (OR = 3.05). Muslim women were less likely to use contraceptives compared to Orthodox Christians (OR = 0.5).

Conclusion: The analysis revealed key factors that determine women's contraceptive use in Ethiopia. Interventions that promote couple's communication, gender equality, participation of faith leaders in family planning education and counseling, increasing family planning access to remote areas and communities through innovative and new approaches could be effective to increase family planning service coverage.

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INTRODUCTION

Background

More women in developing countries use contraceptives than any other time in history. Globally, 64 percent of married women in the age group 15 to 49 years used some form of contraceptive in 2015: from 33 percent in Africa to 75 percent in North America (United Nations, 2015). The contraceptive prevalence rate in developing countries has increased from 52 percent in 1990 to 62 percent in 2010. However, the increase in contraceptive prevalence in East Africa region was the highest (20.3%) compared to other regions of the world in the same decade (Alkema, Kantorova, Menozzi, & Biddlecom, 2013). Ethiopia became a recent success story in family planning from having one of the lowest contraceptive prevalence rates in 1990 (6.3%) to above average performance for the African region (36%) in 2016 (Central Statistical Authority/Ethiopia & ORC Macro, 2016).

Increases in contraceptive prevalence rates have significant impact on the health and wellbeing of women and children. Contraceptive use reduces fertility rate by decreasing pregnancy rates which in turn reduce the risks of maternal mortality. Birth spacing improves the health of women and promotes the survival of young children (M. Greene, Joshi, & Robles, 2012; World Health Organization, 2012). Total fertility rate dropped from 7.0 children per woman in 1990 to 4.6 children in 2016 in Ethiopia (Central Statistical Authority/Ethiopia & ORC Macro, 2016; Olson & Piller, 2013; United Nations, 2015). Furthermore, the proportion of unwanted births decreased from 17 percent in 2000 to 9 percent in 2011 (Central Statistical Agency/Ethiopia & ICF International, 2012). Contraceptives prevented 4,383 maternal deaths (25.6% of maternal deaths) in 2010 in Ethiopia (Ahmed, Li, Liu, & Tsui, 2012). Under 5 mortality rate reduced from 167 deaths per 1,000 live births in 1990 to 60 deaths per 1,000 live births in 2015. Similarly, infant

mortality rate declines from 123 deaths per 1,000 live births to 48 deaths per 1,000 live births in 2016 (Central Statistical Authority/Ethiopia & ORC Macro, 2016; NPC & UN, 2015).

Success in family planning in Ethiopia came mainly because of expansion of family planning services to rural areas where most of the population lives. Equally important were strong government, donors and non-government partners' commitments to family planning. With the resources provided trained lower level health workers were deployed to provide injectable contraceptives, insert implants and provide medical abortion services. New health centers and health posts increased access to family planning and other basic health services. Changes in the contraceptives supply chain management improved availability of contraceptives in health facilities (Halperin, 2014; USAID/Africa Bureau, 2012).

Statement of the Problem

Despite the improvements in family planning services in Ethiopia, the progress made is not adequate. Unmet need for family planning remains high where one out of four sexually active women that want to delay child bearing or stop having children are not using contraceptives (Alkema et al., 2013; Central Statistical Authority/Ethiopia & ORC Macro, 2016). Most sexually active women (married and unmarried) rely on short term methods (Halperin, 2014); in 2016, only 31 percent of married women in reproductive age group used long acting reversible contraceptives. Contraceptive use among poor women and women in rural areas is still low. Women that live in remote areas of the country also have limited access to family planning services. Only 2 percent of married women of reproductive age group use contraceptives in Somali region while 56 percent use contraceptives in Addis Ababa (Central Statistical Authority/Ethiopia & ORC Macro, 2016).

Previous studies reported that contraceptive use among Ethiopia women has been associated with their educational status, economic status, age, place of residence, belief system, fertility intentions,

husband's views of contraceptives and preferences of couples (Worku, Tessema, & Zeleke, 2015). Social determinants have the power to shape men and women's ability to access family planning services at different periods in their lifetimes (M. Greene et al., 2012). With changes in socioeconomic developments in the country, the factors that influence contraceptive use may also change. Family planning programs need to be able to adapt to the changes in the community and design appropriate programs to further increase access and improve utilization of contraceptives.

Purpose Statement

The purpose of this thesis is to identify key factors that are associated with married women's contraceptive use in Ethiopia. The study will compare sociodemographic, pregnancy and fertility related factors between contraceptive users and non-users. The study will also determine the significance of factors associated with family planning and explain the strength of the associations.

Research Questions

1. What are the key sociodemographic, pregnancy and fertility factors that affect married women's contraceptive use in Ethiopia?
2. In what ways are contraceptive users different from non-users?
3. Are any of spouse related factors related to contraceptive use?

Significance Statement

Contraceptive use among married women in Ethiopia is encouraging. Knowledge about contraceptives has become universal and access to family planning services improved. Despite the improvements and changes in family planning service availability, the contraceptive prevalence rates and unmet need for family planning are far from the targets set by the Federal Government.

Several factors were identified to be related to contraceptive use but the relationship among the factors and contraceptive use has not been consistent. Some studies in Ethiopia assessed family planning determinants but did not have wide geographic coverage. Factors such as spousal communication and male involvement in family planning and their impact on contraceptive use have not been studied widely in Ethiopia. This study sheds light on the dynamics of family planning decision making between spouses and their contraceptive use. Understanding the effects of sociodemographic, fertility and pregnancy related factors on contraceptive use of women will help family planning programs to design targeted interventions.

Definition of Terms

Contraceptive Prevalence Rate	The percentage of women 15 to 49 years that are currently using, or whose sexual partner is currently using, at least one method of contraception, regardless of the method used.
Kebele	The smallest unit of local government with an average population of 5,000 people. Kebeles have an administrative structure with elected officials but are not budgetary units.
Maternal Mortality	The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.
Region	Equivalent to a State and geographically delimited based on language and ethnic identity. Regional states implement social and economic

	policies and maintain public order including administering of police force.
Total Fertility Rate	The average number of children a woman will have if she lives all her reproductive years (15 to 49)
Unmet Need for Family Planning	The percentage of women of reproductive age, either married or in a union who want to stop or delay childbearing but are not using any method of contraception.
Woreda	Is equivalent of district and managed by the local government. Woredas have an average population of 100,000 and are composed of numbers of kebeles.

LITERATURE REVIEW

Brief Overview of Ethiopia

Demographics

Ethiopia is a large and multiethnic country with over 100 million people, second populous in Africa, composed of over 80 ethnic groups. Ethiopia is primarily an agricultural country where over 80 percent of the population lives in rural areas (Central Intelligence Agency, 2016). The country is one of the poorest in the world with per capita income of USD 550 in 2014 (Population Reference Bureau, 2016; World Bank Group, 2016). One third of the country's population lives below the poverty line and 5 to 7 million people need food and related assistance every year (Stiftung, 2016).

Ethiopia has a young population with the median age of 17.8 years and only 3% of the population above the age of 65 years. Forty-one percent of the country's population is below the age of 15 years. However, the life expectancy for both men and women, 62 and 66 years respectively, is above the estimated average for the continent of Africa (male 59 years and female 62 years)(Population Reference Bureau, 2016).

Two ethnic groups, Oromo and Amhara, contribute to about 60 percent of the population and Amharic is the official national language. States use different working official languages and English is the major language taught in schools. The most common religions practiced in the country are Ethiopian Orthodox 45%, Islam 35%, and Protestant 18.5% (Central Intelligence Agency, 2016; FDRE & Commission, 2008; Population Reference Bureau, 2016).

History and Government

Ethiopia is one of the oldest countries in the world that traces back its history over 2000 years. The country maintained its independence except for short lived Italian occupation from 1936 to 1941. Since the monarchy fall in 1974, since then, the country has experienced coups, civil wars, severe droughts, and massive population movement and migration. The current government came to power in 1991 after defeating the socialist government that had been in power for 17 years since the fall of the monarchy (Central Intelligence Agency, 2016).

Ethiopia has a federal parliamentary form of government comprising of nine ethnically based regional states and two administrative cities. The federal government and the regional states have legislative, executive and judicial authorities. The regional states are divided in to smaller administrative areas called woredas which are further divided in to kebeles (Gazeta, 1995; UNICEF, 2016).

Status of Women and Gender Relations

Ethiopia is male dominated society where women are expected to be submissive to men. Women have lower income than men; tend to be less educated and do not have decision making authority. Deep rooted religious beliefs and tradition are said to have contributed to the low status of women in Ethiopia. For centuries, the legal system also endorsed and sustained the inferior status of women (Haregewoin & Emebet, 2003).

A mixed method national study in 2014 examined gender inequality and women's empowerment among men and women in 2005. The findings of the study shade light on the widely-held beliefs of the status of women in the society. Most community norms dictate that girls marry at a young age and obey their husbands. In rural parts of the country, women's contribution and role was

limited to households. Heavy household work forces young girls and women to drop out of school to generate income through employment (Ethiopian Society of Population Studies, 2008).

Haregewoin and Emebet documented that most women could make decisions on daily matters of the household but not major decisions such as purchases and reproductive health matters. The authors claimed that only 25% of women could make decisions on contraceptives use (Haregewoin & Emebet, 2003). The study by the Ethiopian Society of Population Studies reported that most rural women, i.e. 84 percent, could not make decisions about their health by themselves. Rural women were 3 times less likely to make decisions about their own health by themselves compared to women in urban areas. Their contributions in the house were not valued and men made most of the important decisions (Ethiopian Society of Population Studies, 2008).

Studies among women in Ethiopia documented that women's decision making in family planning was closely linked to women's education and employment status. A cross sectional survey among married women in urban Mizan-Aman in SNNPR in 2013 found that married women with formal education were more likely to have a decision power on family planning than women that were illiterate. Women that attended primary and secondary level education were more likely (4.6 and 9 times respectively) to have had decision making power than illiterate women. Likewise, women that were self-employed and in civil service were more likely to have had decision making power - 2 and 4 times respectively - than housewives (Belay, Mengesha, Woldegebriel, & Gelaw, 2016).

A similar study that used mixed methods among married women in Dawro zone of SNNPR reported that women in rural areas were less likely to make decisions on family planning when compared with urban women (Bogale, Wondafrash Kibebew, Degfie, & Girma, 2011). Women in rural areas tend to be less educated and not engaged in formal employment compared to women in urban areas (NPC & UN, 2015). Educational level and employment status can justify rural

women's disadvantage in decision making power as education of women played a crucial role in women's decision making power as demonstrated by the findings of Belay et.al's study.

Since 2000, Ethiopia has made improvements in gender equality. The ratio of girls to boys (GPI) in schools increased from 0.7 to 0.93 in primary education between 2000 and 2014. Similarly, the gender parity index in secondary schools increased from 0.7 in 2000 to 0.94 in grades 9 to 10 and 0.85 in grades 11 to 12 in 2014 (NPC & UN, 2015). Women's parliamentary representation also increased by 36 percent between 2000 and 2014. Women's representation in legislative and executive branches of government and general representation in civil service also increased. However, despite these improvements, unemployment among young females continued to be higher than young men during 2010-2014 period. The improved representation of women did not translate to tangible participation of most women in the country. The report claimed that the poor participation of women in the employment sector was due to long standing cultural and traditional discrimination (NPC & UN, 2015).

Family Planning in Ethiopia

Modern family planning services were started by Family Guidance Association of Ethiopia, a local non-governmental organization, in 1966. Services were geographically limited and mostly used by urban women. Family planning services became part of maternal and child health services by the Ministry of Health in 1980 and a national survey conducted in 1990 reported contraceptive prevalence rate of 2.3%. (Health, 2011; USAID/Africa Bureau, 2012). The progress in the subsequent years was slow and the contraceptive prevalence rate increased only by 3.7 percent (i.e. became 6 percent) a decade later in 2000 (Central Statistical Authority/Ethiopia & ORC Macro, 2001).

The government rolled out the national population policy in 1993 that aimed at balancing the population growth with the country's economic growth. Specifically, it set targets to reduce total fertility rate from 7.7 in 1990 to 4.0 in 2015. The policy encouraged the expansion of community and health facility based distribution of contraceptives and proposed raising the minimum age of marriage to 18 years (TGE, 1993). The minimum age of marriage was legally set at 18 years in the revised family law in 2000 (Federal Negarit Gazetta of the FDRE, 2000).

Studies documented that most Ethiopian women, married or non-married, used modern contraceptives. The 2016 DHS reported that over 97% of married women used modern contraceptive methods. The most common contraceptive methods used by married women were injectables (23 percent) and implants (8 percent) followed by oral contraceptive pills (2 percent). Compared to the 2011 demographic health survey, more women chose long acting reversible contraceptive methods. The proportion of women that used implants in 2016 was 3 times higher while and the proportion that used pills reduced by half (Central Statistical Agency/Ethiopia & ICF International, 2012; Central Statistical Authority/Ethiopia & ORC Macro, 2016).

In the last 2 decades, Ethiopia became one of the recent family planning successes (Halperin, 2014; United Nations, 2015; USAID/Africa Bureau, 2012). It managed to double its contraceptive prevalence rate two times in a decade, from 6 percent in 2000 to 27 percent in 2011 (Central Statistical Agency/Ethiopia & ICF International, 2012). The Demographic and Health Survey conducted in 2016 reported further 9% increase from the 2011 prevalence rate, i.e. 36% of married women used family planning methods. Similarly, the total fertility rate declined from 5.5 children per women in 2000 to 4.6 per woman in 2016. However, findings of the 2016 survey showed that, rural women continued to have more children (5.2 children) than their urban counterparts (2.3 children) (Central Statistical Authority/Ethiopia & ORC Macro, 2016).

Worku et.al. analyzed DHS data from 2000 to 2011; they found that the increase in contraceptive use among married women in Ethiopia came largely because of the increased contraceptive use among rural women. The authors also argued that women from two of the most common religions, orthodox Christians and protestants, increased use of contraceptives contributed to the increase in contraceptive prevalence rate in the country (Worku et al., 2015).

The highest contraceptive prevalence rates among married women in 2016 were from Addis Ababa (56 percent), Amhara region (47 percent), SNNP (40 percent), and Tigray region (36 percent). Somali region had the lowest contraceptive prevalence rate of 1.5 percent (Central Statistical Authority/Ethiopia & ORC Macro, 2016). The contraceptive prevalence rate of Addis Ababa decreased by 1% from its level in 2005 (57 percent). On the other hand, SNNP, Amhara and Tigray regions increased by the prevalence rates 4, 3 and 2 times from the rates in 2005 (Central Statistical Agency/Ethiopia & ORC Macro, 2006).

The demand for family planning services increased from 45 percent in 2000 to 58 percent in 2016. However, even with the increase demand, unmet need decreased consistently from 37 percent in 2000 to 22 percent in 2016. There was only 1 percent change in unmet need between 2000 and 2005. The decline was rapid between 2005 (36 percent) and 2011 (29 percent) and later 22 percent in 2016(Central Statistical Agency/Ethiopia & ORC Macro, 2006; Central Statistical Authority/Ethiopia & ORC Macro, 2016).

The improvements were not only in family planning but also in other aspects of maternal and child health. There was a consistent decline in infant and child mortality rates in the last 2 decades and the country met Millennium Development Goal 4 (MDG 4) of reducing under five mortality rate by two-thirds between 1990 and 2015. Infant mortality rate decreased from 78 deaths per 1,000 live births in 2002 to 48 deaths per 1,000 live births in 2016. Similarly, the under 5 mortality rate

decreased by 58%, from 116 deaths per 1,000 live births to 67 deaths per 1,000 live births, during the same period (Halperin, 2014; USAID/Africa Bureau, 2012).

Authors that documented the progress of family planning in Ethiopia put forward four major factors for the success in Ethiopia. These were: government commitment, strong donor support, a functioning public-private partnership and improved access to contraception through network of health workers. The government established a network of 35,000 new health cadres based at the community that provided various methods of contraceptives in rural areas where access to family planning was limited (Halperin, 2014; Olson & Piller, 2013; USAID/Africa Bureau, 2012).

Donors aligned their funding for contraceptives procurement and public-private partnerships improved the contraceptive supply chain (Halperin, 2014; Olson & Piller, 2013; USAID/Africa Bureau, 2012). Outlet surveys conducted by FPwatch Project in 2015 in family planning service delivery points in rural and urban areas reported that there was steady supply of contraceptives. In 70 percent of rural family planning service delivery points, at least 3 methods of contraceptives were available and at least 5 family planning methods were available in all of the tertiary level health facilities (PSI and FPwatch, 2016).

Despite the improvements in family planning coverage, the current fertility rate is 1.7 times higher than the world's average (Population Reference Bureau, 2016) and unmet need for family planning among married women is twice the world's average (Federal Ministry of Health of Ethiopia, 2016; United Nations, 2015). In 2016, over 1 in 5 married women had unmet need for family planning in Ethiopia. The unmet need was also high among unmarried sexually active women: one in four unmarried sexually active women had unmet need for family planning(Central Statistical Authority/Ethiopia & ORC Macro, 2016). The unmet need does not only signal challenges in

family planning but it is also an indicator of achievement as it shows the amount of demand created (USAID/Africa Bureau, 2012).

The Federal Ministry of Health and its stakeholders identified the challenges in family planning in the country. These challenges were: disparities among regional states, reliance on short-term contraceptive methods, inadequate funding, inconsistent contraceptive supply and costly supply chain management system (Federal Ministry of Health of Ethiopia, 2016).

Factors Associated with Contraceptive use in Ethiopia

Education

Educated women are more likely to using contraceptives than uneducated women. In 2016, 31 percent of married women with no education used contraceptives while 55 percent of women with post-secondary education used contraceptives (Central Statistical Authority/Ethiopia & ORC Macro, 2016). These findings are consistent with the reports of 2005 and 2011 demographic health surveys (Central Statistical Agency/Ethiopia & ICF International, 2012; Central Statistical Agency/Ethiopia & ORC Macro, 2006). However, Lakew et. al analysis of the 2011 DHS data did not show a strong association between education and contraceptive use, adjusted OR of 1.2 (0.7-1.9) for contraceptive use among women in post-secondary education (Lakew, Reda, Tamene, Benedict, & Deribe, 2013).

Other studies from Ethiopia reported stronger associations between education and contraceptive use. A cross sectional study conducted among married women in Mojo town in Oromia region in 2011 reported that literate women were 2 times more likely in using contraceptives than illiterate married women (Regassa & Gizaw, 2011). Another study in the same year in Butajira district in SNNP region among married women reported an association between primary education (AOR

1.3) and post-secondary education (AOR 2). Similarly, primary and post-secondary level education of spouses was strongly associated with contraceptive use (W. Mekonnen & Worku, 2011).

On the other hand, a study conducted in Debre Birhan district in Amhara region in 2014 did not show significant association between education level and contraceptive use among married women (Mohammed, Woldeyohannes, Feleke, & Megabiaw, 2014). The lack of association may be because Debre Birhan district had higher proportion of literate study participants than the Butajira study. 72% of the participants in the Butajira district study were illiterate while only 22% of the study participants in the Debre Birhan study could not read and write.

Urbanicity

Married women residing in urban areas tend to use contraceptives more than rural women in Ethiopia. The gap in contraceptive prevalence rate between urban and rural areas is decreasing. In the 2016 survey a difference of about 20 percent in contraceptive prevalence rate was reported (contraceptive prevalence rate of 52 percent in urban areas and 33 percent in rural areas). In the previous years the differences in contraceptive prevalence ranged from 32 to 40 percent (Central Statistical Authority/Ethiopia & ORC Macro, 2016; Worku et al., 2015). Despite the marked differences in the proportion of women that use contraceptives between urban and rural areas, Worku et. al.'s analysis of the DHS data from 2000, 2005 and 2011 did not show association between contraceptive use and urbanicity (Worku et al., 2015).

Wealth

The analysis of 2011 DHS data by Lakew et.al determined that wealthy married women were 2 times more likely to using contraceptives compared to poor married women. On the contrary, women that were unemployed were 30% more likely to using contraceptives than women that were

previously employed or employed at the time of the national survey (Lakew et al., 2013). Similarly, analysis of the previous DHS data (2000, 2005 and 2011) by Worku et.al. established that the richest women were 5.5 times more likely than the poorest women in using contraceptives (Worku et al., 2015).

Having living children

Women that had more living children reported to using contraceptives more than those that do not have living children. Lakew et.al. analyzed the 2011 DHS data and reported that women that had more than one living child were more than 2 times likely to using contraceptives than women with no living children (Lakew et al., 2013). On the contrary Worku et.al did not show any association between number of living children and contraceptive use (Worku et al., 2015).

Male involvement

Even though family planning requires the contribution of both men and women, for years, family planning programs, family planning methods, researches remained focused mainly on women. There are fewer methods of contraception that call for men's direct involvement. This, however, does not fully explain the low prevalence of contraceptive use by men (United Nations, 2015). Becker argued that biological factors justified developing contraceptives for women and this in turn influenced researchers and programmers to align their focus on women (Becker, 1996). This focus on women strengthened the view that family planning is mainly issue of women and that men have minor roles (Toure, 1996).

In developing countries, men may directly and indirectly control women's use of family planning methods. Greene et al further claimed that men could prevent women from using contraceptive methods or prevent them from accessing services and men's authority over the family's income

could also impact women's access to contraception. This may compel women to access and use contraceptives without the knowledge of their husbands (Greene et al., 2006).

Studies from Ethiopia have also documented that a significant proportion of men did not support contraceptive use and did not have positive views on family planning. A cross sectional study that explored men's involvement in family planning among married men in Debremarkos town in Amhara region found that 38% of married men did not support their wife's use of contraception. The reasons stated for the objection by the married men were men's desire to have larger families, spouse's objection to contraception, uneasiness about the side effects of contraceptives, religious prohibition, and limited knowledge of contraceptives. One in four men in the study said that men should be the decision makers on the types of contraceptives to be used and about 50 percent of the men also believed that family planning methods reduces the trust between couples (Kassa, Abajobir, & Gedefaw, 2014).

Men's approval of family planning was also found to be an important factor in women's use of contraception. A cross sectional study among couples in Jimma Zone in Oromia region in 2010 demonstrated that women were more than two times likely to using contraceptives when their husbands were supportive of family planning (Tilahun et al., 2014).

Mekonen and Worku's study in the same year in Butajira district in SNNPR also had similar findings. Women that had supportive husbands were 2.56 times more likely to using contraceptives than women whose husbands were not supportive of family planning (W. Mekonnen & Worku, 2011).

Couples Communication

Men and women may have different views about having children, timing of pregnancy and contraception. Studies have documented that some couples do not discuss issues of sexual and reproductive health. When there is limited communication or no communication between partners, one partner may not know what the other one thinks about family size or will have inaccurate assumptions about the wishes of the other partner. Couples that do not talk about family planning issues may not be able to meet their desired family size. These couples will likely be unable to use some methods of contraception that require couples' cooperation and negotiation (M. E. Greene et al., 2006).

Mekonen and Worku's study in 2009 among married women in Butajira district in SNNP region reported that family planning discussion between couples was significantly associated with contraceptive use. Married women that discussed family planning methods with their husbands were 2 times more likely to using contraceptives than women that did not discuss contraceptives with their husbands (W. Mekonnen & Worku, 2011).

The study by Tilahun et.al from Jimma Zone in Oromia region analyzed the effects of spousal communication and contraceptive use. The authors reported that couples' discussion of family planning was significantly associated with their contraceptive use. Women that discussed family planning with their husbands were 2.4 times more likely to using contraceptives (Tilahun, Coene, Temmerman, & Degomme, 2014).

Mohammed et.al in Debre Birhan district in Amhara region in the same year (2010) and Tilahun et.al reported stronger association between family planning discussion of couples and contraceptive use. Married women that discussed family planning with their husbands once were more than 4 times likely to use contraceptives than those who did not discuss family planning with

their husbands. The likelihood of contraceptive use also increased with the increase in the frequency of couple communication (Mohammed, Woldeyohannes, Feleke, & Megabiaw, 2014).

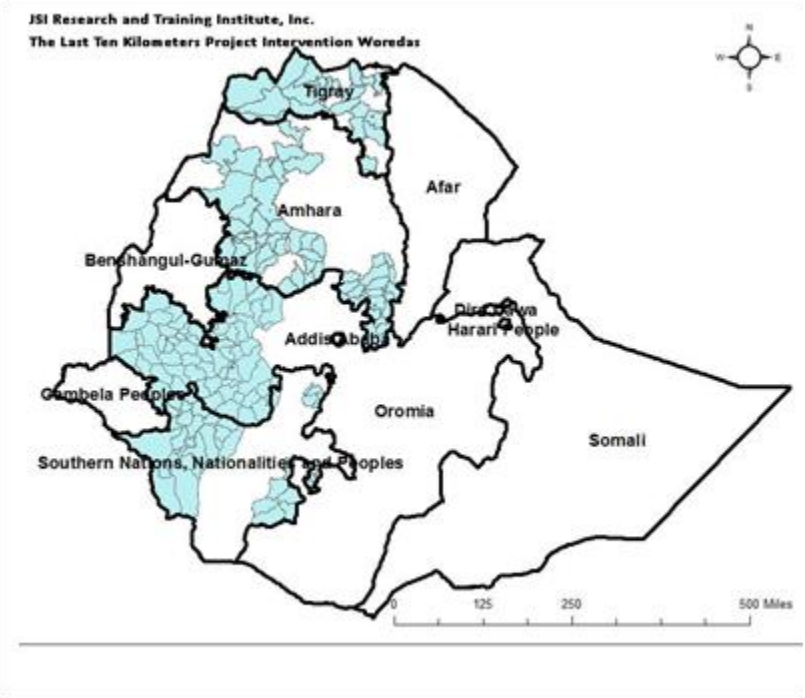
A two-years longitudinal study from Ghana attempted to determine if there was a causal relationship between husband-wife family planning communication and contraceptive use from 1995 to 1997. The study concluded that spousal communication about family planning preceded contraceptive use after controlling for other factors. Moreover, the author also demonstrated that spousal discussion promoted contraceptive use but not the other way around (Bawah, 2002).

METHODS

Introduction and Overview

This study is a secondary data analysis from the Last 10 Kilometers project from a survey conducted in December 2014 -January 2015. The L10K project is funded by The Bill and Melinda Gates Foundation, USAID and UNICEF and aimed at improving maternal, newborn and child health care behavior and practices in Tigray, Amhara, Oromia and Southern Nations and Nationalities (SNNP) region in Ethiopia.

Figure 1: Map of Ethiopia showing the Last Ten Kilometers Project Intervention Woredas (JSI, 2015)



Study population and Design

The survey collected data from women 15-49 years of age residing in selected households of L10k project woredas in four regions. All women 15-49 years were eligible for the study. The study participants were selected from L10K Project woredas are in Amhara, Oromia, Southern Nations

and Nationalities and People (SNNP) and Tigray. The study was conducted in 115 of the L10K project Woredas (see figure 1) living in the selected 324 kebeles.

Sampling methods and Data Collection

The sampling methods and data collection methodology for the original study has been previously described in L10K project publication: The Last Ten Kilometres Project (L10K) 2015. Trends in reproductive, maternal, new born and child health care practices in 115 L10K woredas: Analyses of three rounds of survey data.

Variables

This study utilized existing survey data to explore factors associated with couples' contraceptive use. The primary outcome of the study was whether couples used any method of to delay or avoid pregnancy as reported by women. The outcome was chosen over ever usage of contraceptives because it represents contraceptive usage at the time of the survey.

The exposure of interest was the presence or absence of discussion of family planning with a spouse 6 months prior to the survey. Discussion of family planning between couples was assumed to enhance couples' contraceptive use.

Studies in Ethiopia demonstrated that women's age, women's education status, residence (urban/rural), religion, having living children, husbands' attitude towards family planning, and couples discussion of family planning were associated with contraceptive use (T. B. Mekonnen, Moges, & Mengesha, 2013; W. Mekonnen & Worku, 2011; Regassa & Gizaw, 2011; Worku et al., 2015). Therefore, these variables were included in models to test the effect of the exposure of interest and other variables.

Statistical analysis

All statistical analysis were conducted using STATA version 14 where svyset commands were used to apply sampling weights and to adjust for clustering of observations within PSUs and stratification by region. The sampling weights and the stratified study design were applied when conducting descriptive univariate analysis, bivariate tests of associations and multivariate logistic regression tests. Statistical significance was evaluated at $P<0.05$.

For the descriptive univariate analysis means, percentages and 95% Confidence Intervals (95% CI) were calculated to describe socio-demographic and family planning characteristics of women of reproductive age. Women of reproductive age that were current users of contraceptives were compared with non-users across demographic, pregnancy and family planning related characteristics using logistics regression in bivariate analysis. Odds ratios, 95% CI and p-values were calculated. Potential predictors of contraceptive use were Woman's Age (in years), Education in years, Religion, number of living children, woman's approval of contraception, husbands' attitude towards family planning, and couples discussion of family planning.

Multivariate logistic regression analysis was conducted to identify factors that were independently associated with current contraceptive use among women. Variables associated with contraceptive use in the bivariate analysis at $P<0.1$ level were included in the development of the model in the multivariate analysis. Manual backward stepwise regression was used to develop a multivariable logistic regression model of factors associated with contraceptive use in Ethiopia. Only factors significant at the $\alpha= 0.05$ level were retained in the final model.

Stratum specific odds ratios were compared to assess effect modification. Confounding was assessed by comparing adjusted and unadjusted odds ratios with and without the potential confounding variable, a difference of 10% change in the odds ratios.

Ethics

This is a secondary data analysis of survey data collected by JSI in Ethiopia. JSI Institutional Review Board approved the study on December 22, 2014 (IRB approval letter attached). The study also obtained IRB approvals from Amhara, Oromia, SNNP and Tigray regional health bureaus. Data were requested from JSI Ethiopia office and approval obtained. De-identified data files on the requested variables were made available in STATA and excel. Data were downloaded and handled confidentially.

RESULTS

Between December 2014 and January 2015, a total of 3,988 women of reproductive age (15-49 years) were interviewed from four regions of Ethiopia: 770 (14.11%) in Tigray, 1,077 (35.51%) in Amhara, 1,083 (25.81%) Oromia and 1,058 (24.53%) in SNNP regions. The mean age of the participants was 28 years. Over half of the respondents were not able to read or write. The average of years of education was 6.7. The proportion of those who were married was 88 percent while, 11 percent were single and less than 1 percent reported that they were living with a man. Over three fourth of the respondents were Christians (80.65%), majority were Orthodox Christians (60%), and 19 percent were Muslim respondents (table 1).

Out of 2,639 respondents, about two thirds (67%) reported using any family planning method to prevent or delay pregnancy. Of the 1,790 respondents that reported using contraceptive methods, two methods accounted for over 90 percent of all contraceptive use: injectables (67.92%) and implants (25.06%). The proportion of respondents that used pills and IUD were 2.97% and 1.93% respectively. Condoms were the least frequently used methods of modern contraception (0.01%). Majority of the respondents (59.5%) reported discussing family planning with their spouse in the 6 months prior to the survey (table 1).

Table 1: Selected demographic and family planning characteristics of women of reproductive age, Ethiopia, 2015

Characteristic	N (3,988)	Mean or %	95% CI
Age (years)		28.16	27.81 - 28.50
Able to read or write			
Yes	1,767	44.05%	41.46% - 46.67%
No	2,221	55.95%	53.33% - 58.54%
Education (years)	1,676	6.58	6.35 – 6.81
Marital Status			
Single	461	11.26%	9.95% - 12.71%
Married	3,505	88.15%	86.68% - 89.47%
Living together	22	0.6%	0.4% - 0.9%
Region/State			
Tigray	770	14.11%	12.54% - 15.85%
Amhara	1,077	35.51%	32.55% - 38.58%
Oromia	1,083	25.85%	22.55% - 29.44%
SNNP	1,058	24.53%	22.00% - 27.25%
Religion			
Orthodox	2,297	60.39%	56.68% - 64.09%
Protestant	879	20.26%	16.58% - 23.93%
Muslim	785	18.73%	14.41% - 23.04%
Other	27	0.63%	0.13% - 1.13%
Contraceptive use	2,639		
Yes	1,769	67.03%	64.48% – 69.48%
No	870	32.97%	30.52% – 35.52%
Current contraceptive method	**1,769**		
Injections	1,185	67.92%	64.27% - 71.35%
Implants	455	25.06%	21.95% - 28.44%
Pill	55	2.97%	2.12% - 4.15%
IUD	36	1.93%	1.18% - 3.13%
Female sterilization	12	0.89%	0.46% - 1.71%
Lactational amenorrhea	11	0.47%	0.22% - 1.02%
Periodic abstinence	7	0.48%	0.22% - 1.06%
Withdrawal	1	0.00%	0.00% - 0.05%
Condom	1	0.01%	0.00% - 0.09%
Others	6	0.27%	0.09% - 0.81%
Discussion of family planning	**3,367**		
Yes	1,992	59.5%	56.91% - 62.03%
No	1,375	40.5%	37.97% - 43.09%

In bivariate analysis (Table 2), the following factors were significantly associated with contraceptive use: couples that discussed family planning in the 6 months prior to the survey (p=0.000), women whose husbands supported family planning (p = 0.000), being protestant (p=0.000), residing in either Oromia (p=0.000) or in SNNP region (p=0.000), age 35 years and above (p=0.002), women that approved contraceptive use (p = 0.007), and having 1-3 living children (p = 0.012).

Women in the survey that used contraceptives were more likely to have discussed family planning with their spouse in the 6 months prior to the survey (OR: 6.65) and had husbands that supported family planning (OR: 3.59). Women that used contraceptives were more likely to be of the Protestant Christian faith (OR:1.97), reside in Oromia (OR: 2.94) or SNNP (OR: 1.91) regions. However, older women (above the age of 35 years) were less likely to use contraceptives (OR: 0.51). Women that used contraceptives were also more likely to approve contraceptive use (OR: 3.63) and had 1-3 living children (OR: 3.86) (Table 2).

Table 2 Bivariate associations of current contraceptive use with demographic, pregnancy and family planning related characteristics

Characteristic	OR	95% CI	P-value
DEMOGRAPHIC			
Age (years)			
15-19			
20-24	1.07	0.681 – 1.68	0.769
25-34	0.71	0.462 – 1.078	0.107
35 and above	0.51	0.337 – 0.781	0.002*
Education (years)			
Primary			
Secondary	1.05	0.73 – 1.53	0.784
Above secondary	1.25	0.52 – 3.01	0.621
Region/State			
Tigray			
Amhara	1.32	0.96 – 1.81	0.086**
Oromia	2.94	2.00 – 4.30	0.000*
SNNP	1.91	1.34 – 2.72	0.000*
Religion			
Orthodox			
Protestant	1.97	1.48 – 2.62	0.000*
Muslim	1.18	0.88 – 1.58	0.264
Others	1.83	0.6 – 5.61	0.289
PREGNANCY			
Number of pregnancies			
None			
1-3	1.36	0.78 – 2.35	0.273
4-7	0.82	0.46 – 1.46	0.499
≥8	0.72	0.36 – 1.44	0.351
Number of living children			
None			
1-3	3.86	1.35 – 10.99	0.012*
4-7	2.31	0.82 – 6.48	0.112
≥8	2.26	0.75 – 6.81	0.147
FAMILY PLANNING			
Woman's approval of contraception			
No			
Yes	3.65	1.43 – 9.31	0.007*
Husband's support to family planning			
No			
Yes	3.59	2.45 – 5.27	0.000*
Couples that discussed family planning			
No			
Yes	6.65	5.21 – 8.49	0.000*

Note: Level of Significance: *p<0.05; **p<0.1

Table 3 – Multivariate logistic regression analysis of factors associated with contraceptive use among women of reproductive age adjusted for demographic, pregnancy and family planning variables, Ethiopia, 2015

Characteristics	Adjusted OR	P-value	95% CI
Region/State			
Tigray			
Amhara	1.34	0.085	0.96 – 1.88
Oromia	4.20	0.000*	2.50 – 7.05
SNNP	2.36	0.000*	1.55 – 3.59
Religion			
Orthodox			
Protestant	0.93	0.709	0.63 – 1.37
Muslim	0.50	0.003*	0.32 – 0.78
Others	0.70	0.659	0.14 – 3.43
Number of living children			
None			
1-3	3.05	0.046*	1.02 – 9.14
4-7	1.82	0.277	0.62 – 5.39
≥8	2.10	0.207	0.66 – 6.64
Woman's approval of Contraception			
No			
Yes	3.91	0.007*	1.46 – 10.47
Couples that discussed family planning			
No			
Yes	6.75	0.000*	5.29 – 8.60

Note: Level of Significance: *p<0.05

A backward stepwise regression (Table 3) was used for modeling factors associated with contraceptive use. For this logistic regression analysis, demographic, pregnancy and family planning factors listed in Table 2 ($P \leq 0.1$) were eligible for inclusion. The reduced model showed that several factors were associated with contraceptive use among women of reproductive age: residing in Oromia (OR = 4.20) or SNNP region (OR = 2.36) versus Tigray region; being Muslim

(OR = 0.5) versus being an Orthodox Christian; having 1-3 living children (OR = 3.05) versus having no living children; women that approved contraceptive use (OR = 3.91) versus women that did not approve contraceptive use; couples that discussed family planning 6 months prior to the survey (OR = 6.75) versus couples that did not discuss family planning in the same time period. The direction of association was similar in the multivariate analysis as the bivariate results as shown in Table 2 except for the likelihood of Muslim women that reported to have been using contraceptives at the time of the survey. Muslim women were less likely to use contraceptives than Orthodox Christians.

Limitations

The study did not examine if other factors such as wealth, gender norms and sociocultural factors influenced contraceptive use. Similarly, husbands' sociodemographic characteristics that may have influenced couples' contraceptive use; however, these were not captured. Data were collected from women and these women reported their spouses' views on contraceptives. Wives may not accurately represent their spouses' views and hearing directly from husbands would have been the most preferred approach.

The study did not consider couples' discussion of family planning that occurred more than 6 months prior to the survey. Couples may have discussed family planning anytime in their marriage and may have already made decisions about contraceptive use. The study did not explore the details of the discussions between spouses.

DISCUSSION

The findings of this study suggest that most couples (60%) discuss family planning and couples discussing family planning were seven times more likely to using contraceptives. Women's approval of contraceptives and having 1-3 living children were also found to be associated with contraceptive use. Other factors that were associated with contraceptive use were residing in Oromia or SNNP region and being Muslim.

Contraceptive use

Sixty seven percent (67%) of women of reproductive age were using contraceptives at the time of the survey. The proportion of women of reproductive age that reported using contraceptives is almost twice the recent national contraceptive prevalence rate (36%) (Central Statistical Authority/Ethiopia & ORC Macro, 2016). This apparent increase in contraceptive prevalence rate could be due to the work of Last 10 Kilometers project that supported family planning over the years in the selected Woredas. The regions that the project works have above average contraceptive prevalence rates: from 29 percent in Oromia to 47 percent in Amhara region (Central Statistical Authority/Ethiopia & ORC Macro, 2016).

Couples Discussing Family Planning

The study found that couples that discussed family planning 6 months prior to the survey were more likely to use contraceptives. Discussion about family planning was demonstrated to predict contraceptive use (Bawah, 2002). Studies conducted in Ethiopia about couple's communication and their contraceptive use also found that couples that discussed family planning were 2-4 times more likely to use contraceptives than couples that did not discuss family planning (W. Mekonnen & Worku, 2011; Mohammed et al., 2014; Tilahun et al., 2014). The strength of the association in

this study (AOR: 6.75) is much higher than what previous studies reported for single communication in Ethiopia. However, Mohammed et.al reported higher levels of association with contraceptive use for multiple couple's discussions.

Women's Approval of Family Planning

The study confirmed the importance of women's approval of contraceptives. Women that support couple's contraceptive use were almost 4 times more likely to use contraceptives than women that did not approve the use of family planning methods. Regassa and Gizaw reported that women of reproductive age in their study were 6 times more likely to using contraceptives if they approved contraceptives (Regassa & Gizaw, 2011). A study that analyzed the 1998 Demographic and Health Survey in Turkey also had similar findings. Women's approval of contraceptives was an important factor among Turkish women's modern contraceptive use (Alpu & Fidan, 2006). Therefore, family planning programs should work to enhance women's knowledge of contraceptives and dispel myths and misconceptions to help improve their contraceptive acceptance.

Surprisingly, the multivariate analysis did not include husband's support as an important factor that determines contraceptive use. This finding differs from other studies in Ethiopia that reported the positive association between husband's support to family planning and contraceptive use of women (W. Mekonnen & Worku, 2011; Mohammed et al., 2014; Tilahun et al., 2014). This is mostly because women are increasingly controlling their own fertility and without the help of their husbands. The finding also supports the view that men may not have more influence on contraceptive use, contrary to what is mostly believed, and reaffirms that contraceptive use is likely started by women over men (Bankole & Singh, 1998). Women that did not have supportive husbands and those that did not know their husbands views on family planning could be able to make decisions about using family planning methods on their own (Bogale et al., 2011).

Living Children

Women in the study that had at least one living child were 3 times more likely to use contraceptives than women that did not have any living children. Ethiopian demographic and health survey data analysis also showed that women that had 1-4 living children were more likely to use contraceptives than those that did not have any children (Lakew et al., 2013; Tiruneh, Chuang, Ntenda, & Chuang, 2016). This could be because most women start using contraceptives when they have some children. In many developing countries, the social and cultural expectation is for newly married couple to produce children immediately after marriage (Woog, Singh, Browne, & Philbin, 2015). These norms pressurize women that do not have children to not use contraceptives. Women that were offered contraceptives after birth, i.e. post-partum family planning, may also want to prevent future pregnancies.

Place of Residence

Women in the study that were residing in Oromia and SNNP regions were more likely (4 and 2 times respectively) to use contraceptives than women in Tigray region. Contraceptive prevalence rate in Tigray region was the lowest among the regions in the study (i.e. Amhara, Oromia, and SNNP). Lakew et.al also reported higher contraceptive prevalence rates in central and southwestern parts of Ethiopia though their study did not identify contributing factors for the areas that had higher prevalence (Lakew et al., 2013). Tigray region's increase in contraceptive prevalence rate in the last decade was not as fast as other regions in the country (Ayele, Tesfaye, Gebreyes, & Gebreselassie, 2000). Moreover, there is evidence to suggest that women living in rural and remote areas in Tigray have geographic challenges in accessing family planning services and less likely to use them (Medhanyie et al., 2017).

Religion

Muslim women in the study were 50 percent less likely to use contraceptives than Orthodox Christian women. In other studies Muslim women were 30-80 percent less likely to use contraceptives compared to Orthodox Christian women (Ayele et al., 2000; Lakew et al., 2013; Musa, Assefa, Weldegebreal, Mitiku, & Teklemariam, 2016; Tiruneh et al., 2016). Though family planning is permitted in the teachings of Islam (Roudi-Fahimi, 2004), studies from other countries have been reporting that Muslim women were less likely to use contraceptives (Dharmalingam & Morgan, 2004; Morgan, Stash, Smith, & Mason, 2002).

Education

Women's education level was significant in bivariate analysis but was not statistically significant in the multiple regression model. There were no difference in contraceptive use between women that had high school education and above high school education compared to women that had primary level education. Similarly, Mohammed et.al did not find association between educational level and increasing levels of contraceptive use (Mohammed et al., 2014). However, illiterate women are less likely to use contraceptives than literate women in Ethiopia (W. Mekonnen & Worku, 2011; Regassa & Gizaw, 2011). The lack of difference in contraceptive use among literate women in this study shows that even basic level of education has similar effects on women's contraceptive use when compared to higher level education. It has also been demonstrated that with expanded access to primary level education, it is possible to increase contraceptive usage and reduce fertility (Caldwell, 1980); and Ethiopia has to significantly increased primary level education enrollment in the last two decades (from 23 percent in 1995 to 93 percent in 2014) (NPC & UN, 2015).

Conclusion

The study identified important determinants of contraceptive use among women of reproductive age in Ethiopia. The study reinforced that couple's discussion of family planning is a critical determinant of contraceptive use. Family planning programs should continue to promote communication between couples by targeting gender inequality and involving men. Demystifying myths and misconceptions about contraceptives through family planning education and counseling will improve women's understanding of contraceptives and increases the acceptability of family planning methods by women.

The study also revealed the existing wide disparities in contraceptive use among the four regions (Tigray, Amhara, Oromia and SNNP). It is crucial to expand family planning access to remote and hard to reach communities through innovative community based interventions that were proven to work in similar contexts. Understanding the unique needs of different populations that are facing cultural and religious barriers to access contraceptives will help increase the demand for contraceptives. Involving traditional, religious or other community leaders that have influence on norms, attitudes and practices would also help in addressing religious and cultural impediments.

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