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A STATISTICAL ANALYSIS OF FAMILY PLANNING PRACTICES IN ETHIOPIA: AN APPLICATION OF MULTINOMIAL REGRESSION

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Abstract

Family planning survives are the process that persons or couples look forward to attain their desired numbers of children and prepare plan for length of between births. Family planning clear affect the health of women, children, and families economical and socially on worldwide especially those in developing countries. That is family planning helps women avoid unplanned or unwanted pregnancies, and prevent unsafe abortions. This study aimed to identify factors that affect women's family planning practice in Ethiopia. In this study, the data source is EDHS 2016 with a total of 4,392 women of age 15-49 years. Descriptive statistics, single level multinomial logistic regression model were used for statistical analysis. Descriptive result show that about 23.9% of the women practiced family planning while 76.1 % did not practice family planning method. The multinomial logistic regression analysis revealed that the independent variable like place of residence, age of a woman, religion of a woman, educational level of women, wealth index, heard FP method by TV in the last 12 month, visited health facility last 12 month, heard FP method on radio in the last 12 month, marital status, desire to more children, women currently working, number of living children of women and visited by FP worker in last 12 months were found to be significant predictors for women's family planning practice. The study recommends government and non-government organizations should focus on educating women and improving employment opportunities for, Promote family planning by providing better information, supply, access and services about family planning as well as good health centers across all the country.

Keywords: *Family planning, Multinomial regression, odds ratio, EDHS, .*

Introduction

Family planning survives are the process that persons or couples look forward to attain their desired numbers of children and prepare plan for length of between births. There are different types of family planning services/methods, which are achieved through use of contraceptive method and the treatment of involuntary infertility.

Family planning clear affect the health of women, children, and families economical and socially on worldwide especially those in developing countries. That is family planning helps women avoid unplanned or unwanted pregnancies, and prevent unsafe abortions. Additionally, family

planning use helps women space the births of their children, which benefits the health of the mother and child.

The World Health Organization (WHO, 2003) estimated that in the developing countries one woman dies every eight minutes due to unsafe abortions and these unsafe abortions are among the five leading causes of maternal mortality**.** A study in Houston, Texas revealed that 40% of the unplanned pregnancies were due to nonuse of family planning, 20% family planning misuse, and 18% method failure. Enhancing knowledge on family planning use and intention is crucial steps towards reducing the incidence of unintended pregnancy and unsafe and abortions, and its use has greatly improved maternal, infant and child mortality and health problem (WHO, 2003) **.**

Mohammed's study on Determinants of modern family planning utilization among married women of reproductive age group in North Shoa Zone, Amhara Region, Ethiopia, revealed that use of modern family planning among women who were currently married was 46.914%.
The Ethiopian Demographic and Health Survey of 2005 reported that 35%pregnancies among women in reproductive age were unintended (CSA, 2005)**.** As a result, significant proportion of married women turned to induced abortion to avoid unintended pregnancy. According to Ministry of Health 2006 report, approximately half a million pregnancies annually end in induced abortion among 3.7 million pregnancies, which is a reflection of the high rate of unintended pregnancy. Many women, especially younger females in their teen ages, who are exposed to unintended pregnancy, may have inadequate knowledge of contraceptive use due to different reasons. Since unwanted pregnancy is more common among young women.
In this study the researcher would like to investigate and identify the determinants of family planning use such as use family planning, intend to use‟ and nonuse among women of reproductive age in Ethiopia by using multinomial multilevel logistic regression model. Family planning method choice in the context of this research will be referred to as the contraceptive method which a woman of reproductive age (15-49) reports using at the time of the collection of data.

Statement of problem

The persistence to low habit of family planning practice in both developed and developing country has become a major problem particularly in Ethiopia. According to an article done in (2000 by grimes), 600,000 women die globally every year from pregnancy related causes, of which 75,000 cases are due to unsafe abortions. Failure or lack of family planning services is the cause of around 50% of these maternal deaths. "Mothers who have unintended births tend to suffer postpartum depression, feelings of powerlessness, increased time pressure and a general physical health deterioration. They also have poor quality relationships with their children, as they spend less leisure time with them.
Similarly, in Ethiopia according to an article done in 2015 by Selamawit out of the 10176 women of reproductive age, 84.7 percent did not practice FP while only 15.3 percent of women

practice FP method. So due to short habit of FP practice in Ethiopia some problem like (maternal, child death...) exist. Many study done on family planning method were considered only married women But this study cannot restricted to only married women unless single, widowed and divorced women of reproductive age(15-49). And the people of Ethiopia are multi ethnic and multicultural, due to multi ethnic and multicultural nature of the society the way of accepting family planning method varies within societies (women) and between regions. So because of this difference study intended to investigate family planning practice between different ethnic groups (regions) and factors related with difference.

Research Question

1. What are the major factor that affecting family planning status in Ethiopia?
2. Is there any difference between and within regions related to family planning use in the country?

Objective of the Study

The main objective of this study is to identify determinant factors of family planning practice among women in Ethiopia and also, examines the regional differences about status of family planning practice based on EDHS (2016) data set.

More specifically, the study attempts to:

1. To identify socio-economic factors that affects the use family planning practice (FPP) among women in Ethiopia.
2. To identify demographic factors that affects the use family planning practice (FPP) among women in Ethiopia.
3. Determine the factors that explain the variation in family planning practice among women.

Significance of the study

- The results from this study can provide an important input for any possible intervention in different area for the future. Because it is one of the most pressing economic and social problems confronting developing countries whose standard of living weakened substantially.
- In addition, it is expected that this study could provide information to government and other concerned bodies in setting policies, strategies and further investigation for improve family planning method.

Method and Source of Data

Study area

Ethiopia, in the Horn of Africa, is a rugged, landlocked country split by the Great Rift Valley. With archaeological finds dating back more than 3 million years, it’s a place of ancient culture.

With over 109 million inhabitants as of 2019, Ethiopia is the 12th most populous country in the world, the second most populous nation on the African continent (after Nigeria). The country has a total area of 1,100,000 square kilometers (420,000 sq mi). Its capital and largest city is Addis Ababa, which lies several kilometers west of the East African Rift that splits the country into the African and Somali tectonic plates.

Source of data

This study used secondary data from the 2016 Ethiopian Demographic and Health Survey (EDHS) obtained from Central Statistical Agency (CSA). The sample design for the 2016 EDHS used a total of 41,392 women in the age group (15-49) years for analysis of socio economic, demographic, and other proximate that affect family planning use status in Ethiopia.

Variable of the study

Response variable

The response variable of this study was family planning use: The outcome variable has four Categories such as; using family planning, intend to use later and not intend use.

Description of response variable

Response variable	Category
Family planning method usage status	Use any family planning method =0
	Intend to use later =2
	Does not intends to use later =3

Explanatory variable

The independent variables considered in the study were grouped in to demographic, socioeconomic and other proximate variables and they are believed to influence on family planning practice in Ethiopian. The variables with description and their categories are given below.

Description of predictor variable in the study

No.	Factors/ variables	Categories
X_1	Visited by fieldworker in last 12 months	0 = no, 1=yes
X_2	Heard family planning by text messages on mobile phone	0=no, 1=yes
X_3	Sex of household head	0 = male, 1= female
X_5	Current marital status	0 = single, 1= married, 2 = other
X_6	women education level	0= no education, 1= primary 2 = secondary, 3= higher
X_7	Age in 5-year groups	0=15-29, 1=30-39, 2 = 40-49
X_8	Religion	0=Orthodox, 1= catholic, 2= Protestant 3=Muslim, 4=Others

X_9	Type of place of residence	0=urban, 1= rural
X_{11}	women currently working	0=no, 1=yes
X_{12}	Desire for more children	0=want more, 1=undecided 2=want no more, 3=other
X_{13}	Heard family planning on TV last few months	0=no 1=yes
X_{14}	Heard family planning on radio last few months	0=no 1=yes
X_{15}	Visited health facility last 12 months	0=no 1=yes
X_{17}	wealth index	1 = Poor , 2 = Middle , 3 = Rich

Method of data analysis

The study use both descriptive and inferential statistics, descriptive statistics is to provide a brief summary of the data and inferential statistics are trying to come up with a conclusion drawing from the data you have. Among different types of inferential statistics this study use multinomial logistic regression to evaluate this effect.

Multinomial Logistic Regression (MNLR) model is an extension of binary logistic regression model for categorical variable which contains more than two categories. The model permits the comparison of more than one contrast simultaneously. In both MNLR and ordinary logistic regression model, the effects of predictor variables are explained in terms of the odds ratio. The multinomial logit compares multiple groups through a combination of binary logistic regressions. This allows each category of the dependent variable to be compared to a reference category. Normally, the category with the highest numeric score is chosen as the reference category. As a general rule, when there are, say, n possible levels of the dependent variable, the MNLR model will consist of n – 1 equation. The multinomial logistic regression extends to models with multiple predictors.

The maximum likelihood estimation method would be used to estimate the parameters in logistic regression model. The method of maximum likelihood estimation yields to estimate values for unknown parameters which maximize the probability of obtaining the observed set of data. The likelihood ratio test, Pearson and Deviance Goodness-of-Fit used Test of the overall goodness of fit and Wald test to test significance of individual parameter in the model.

The Model selection criterion was used to select the most appropriate model that provides the best fit to the data. There are several model selection criteria, Akaike's information criterion

(AIC) and Bayesian Information Criterion (BIC): aimed for model selection criteria. It is not a test on the model in the sense of hypothesis testing; rather it is a tool for model selection.

Result and Discussion

The purpose of this chapter is summarize, analysis and describe key findings in light to answer the research problem being investigated and to explain any new understanding that emerged as a result of the study problem. In this chapter descriptive and inferential statistics are employed to measure determinant factors that affect family planning practice using SPSS, SAS, and STATA.

Multinomial logistic regressions are statistical model used in this study. Since the response variable considered in this study contain three category (use family planning, intend to use later and not intend to use) then the analysis was done by taking one category as reference and separate model for each of the remain two categories of the response.

Descriptive statistics

The descriptive part provides major socioeconomic, demographic and other proximate determinants of family planning practice presented in Table 4.1.

Table 4.1: Description of status by Socio-Demographic factors

		family planning and intention		
		Use family planning	**Intend to use later**	**Not intend to use later**
		Count (%)	Count (%)	Count (%)
Current marital status	single	33(18.5%)	55(30.9%)	90(50.6%)
	Married	9308(25.5%)	8325(22.9%)	18799(51.6%)
	other	546(11.4%)	600(12.5%)	3636(76.0%)
Wealth index combined	Poor	2848(13.7%)	4397(21.1%)	13615(65.3%)
	Middle	1854(30.6%)	1609(26.5%)	2598(42.9%)
	Rich	5185(35.8%)	2974(20.6%)	6312(43.6%)
Respondent currently working status	No	5919(21.5%)	6136(22.2%)	15527(56.3%)
	Yes	3968(28.7%)	2844(20.6%)	6998(50.7%)
Age in 5-year groups	15-29	2757(27.6%)	3124(31.3%)	4093(41.0%)

	30-39	4664(25.8%)	4626(25.6%)	8759(48.5%)
	40-49	2466(18.4%)	1230(9.2%)	9673(72.4%)
Desire for more children	Wants more	3941(20.9%)	4407(23.3%)	10530(55.8%)
	Undecided	388(18.7%)	449(21.6%)	1242(59.7%)
	Want no more	5307(28.2%)	4110(21.9%)	9375(49.9%)
	other	251(15.3%)	14(0.9%)	1378(83.9%)
Visited by fieldworker in last 12 months	No	6267(21.2%)	5944(20.1%)	17376(58.7%)
	Yes	3620(30.7%)	3036(25.7%)	5149(43.6%)
Heard FP by text messages on mobile	No	9678(23.7%)	8877(21.7%)	22285(54.6%)
	Yes	209(37.9%)	103(18.7%)	240(43.5%)
Heard FP on TV last few months	No	7718(21.5%)	7873(21.9%)	20341(56.6%)
	Yes	2169(39.7%)	1107(20.3%)	2184(40.0%)
Heard FP on radio last few months	No	7174(21.0%)	7171(21.0%)	19740(57.9%)
	Yes	2713(37.1%)	1809(24.8%)	2785(38.1%)
Visited health facility last 12 months	No	4085(18.3%)	4045(18.2%)	14146(63.5%)
	Yes	5802(30.4%)	4935(25.8%)	8379(43.8%)
Sex of household head	Male	8433(27.2%)	7497(24.1%)	15129(48.7%)
	Female	1454(14.1%)	1483(14.4%)	7396(71.6%)
Religion	Orthodox	4859(35.8%)	3548(26.2%)	5155(38.0%)
	Catholic	78(34.7%)	29(12.9%)	118(52.4%)
	Protestant	2428(32.4%)	1838(24.5%)	3239(43.2%)
	Muslin	2471(12.7%)	3364(17.2%)	13681(70.1%)
	Other	51(8.7%)	201(34.4%)	332(56.8%)
Highest educational level	No education	5884(19.4%)	6072(20.1%)	18298(60.5%)
	Primary	2826(34.0%)	2280(27.5%)	3197(38.5%)

	Secondary	738(38.7%)	455(23.8%)	715(37.5%)
	Higher	439(47.4%)	173(18.7%)	315(34.0%)
Type of place of residence	Urban	2640(34.4%)	1242(16.2%)	3784(49.4%)
	Rural	7247(21.5%)	7738(22.9%)	18741(55.6%)

Out of the 41392 women of reproductive age, use FP method were 23.9%, intend to use later 21.7% and does not intend to use 54.4% did observed at the time of the survey.
Table 4.1 revealed that out of the total 41,392 sampled women, 0.4%, 88.0%, 11.6% of them were single, married, other (separated, windowed) respectively. Out of the total married women 25.6% were use family planning while 22.9% were intend to use family planning, 51.6 % of them were not intend to use family planning.
The table also showed that from women who desire additional children 20.9%, 23.3%, 55.8% of them use family planning method, intend to use later and does not intend to use family planning method respectively. Moreover, about 59.7%, of non-use of family planning were undecided to have more children while 49.9% were want no more children and 83.3% were other.
Out a total of women 32.8% were orthodox, 47.1% were Muslim 18.1% were protestant, 0.5% were catholic and 1.4% were other religion follower. Large number family planning user women were orthodox religion follower, about 34.8% were from orthodox, 34.7% were from catholic, 31.95 were from protestant, 12.4% were Muslim, the remain 8.7 % were from other religion.

From the total of 41,392 women of reproductive age (15-49) include in the study 81.5% were lived in rural and 18.5% lived in urban. Out of urban women 34.4% use family planning method, 16.2% were intending to use family planning and 49.4% were not intending to use family planning methods. In other case 21.5% of women from rural area were use family planning, 22.9% intending to use and 55.6% not intending to use family planning, hence majority of women from rural were not use family planning.
Regarding to education level from the total women's majority of them are non-educated 73.1% were as remain 20.1%, 4.4%, 2.2% were at primary, secondary and higher education level respectively. And large number educated women use family planning.

Table 4.1 shows that from the total sampled women in the study 66.6% were not currently working, 33.4% of them were currently working women. Among women who were not working 21.4%, 22.2%, 56.3% of them were use family planning, intend to use and not intend to use respectively and women who were currently working 3.6% use family planning, 20.6% intending to use, 50.7% of them not intend to use family planning.

out of total 41,392 sampled women majority of women 82.3% could not heard family planning on radio last 12 month before survey and 17.7% were heard family planning method on radio. From those who heard information family planning 37.1% were user of modern method, user of

traditional method, 24.8% intend to use later and 38.1% not intend to use family planning. Among women who did not heard family planning method on radio last 12 month before survey only 21.0% of them were user of family planning method, while 56.6% were not intend to use family planning method and the remaining 21.9% intending to use family planning.

The table 4.1 also showed that women heard information about family planning on TV last 12 month before survey were conducted 39.7%of them use family planning, 20.9% intend to use and 40.0% not intend to use family planning method respectively.
Of women did not hear information about family planning on TV last 12 month before survey were conducted 21.5% of them use family planning, 21.9% intend to use and 56.6% not intend to use family planning, means large numbers of women who did not hear information about family planning on Tv don't use family planning.

Of women did not hear information about family planning by text message last 12 month before survey were conducted 23.7% of them use family planning, 21.7% intend to use and 54.0% not intend to use family planning. Of women did hear information about family planning by text message last 12 month before survey were conducted 37.8% of them use family planning, 18.7% intend to use and 43.5% not intend to use family planning.
Majority of women included in the study not visit health center last 12 month before survey were conducted. Among total of 41,392 women included in the study 53.8% were not visited health center last 12 month before survey and 46.2% were visited health facility last 12 month before survey. From those women who visited health center 31.2%, 25.8%, 43.8% were use family planning, intend to use later and not intend to use FP method respectively. And women who were not visited health facility last 12 month before survey 18.3%, 18.2%, 63.5% were family planning, intend to use later and not intend to use FP method respectively.

Result of Multinomial Logistics Regression Model

Multinomial logistic regression model based on category of the response variable two model were fitted by taken does not intend to use later as reference category such as: use family planning method Vs does not intend to use later, and intend to use later Vs does not intend to use later parameter estimation, odds ratio, Wald test statistics and its confidence interval with were used to test significance of individual variables and P-value < 0.05 indicates significance of result.

Table 4.2 Parameter estimation of MNLRM to use FP method relative to does not intend to use

Analysis of Maximum Likelihood Estimates								
Parameter	Category	Estimate	SE	Wald	P-value	OR	95%CI	
							lower	Upper
Intercept		-3.6087	0.2431	220.2893	<.0001			

Place of Residents	**Ref (Urban)**							
	Rural	-0.1450	0.0482	9.0327	0.0027	0.865	0.787	0.951
Women Education level	**Ref (higher)**							
	uneducated	-0.0638	0.0958	0.4438	0.5053	0.938	0.778	1.132
	Primary	0.3360	0.0946	12.6051	0.0004	1.399	1.162	1.685
	Secondary	0.0468	0.1048	0.1994	0.6552	1.048	0.853	1.287
Religion	**Ref (other)**							
	Orthodox	1.4533	0.1581	84.5030	<.0001	4.277	3.138	5.831
	Catholic	0.7194	0.2332	9.5165	0.0020	2.053	1.300	3.243
	Protestant	1.2294	0.1591	59.6857	<.0001	3.419	2.503	4.671
	Muslim	-0.1011	0.1580	0.4095	0.5222	0.904	0.663	1.232
Sex of House Hold	**Ref (female)**							
	Male	0.6664	0.0431	239.4526	<.0001	1.947	1.790	2.119
Number of Living children	**Ref(8+)**							
	0-3	0.7159	0.0648	122.0620	<.0001	2.046	1.802	2.323
	4-7	0.3617	0.0524	47.6230	<.0001	1.436	1.296	1.591
FP by Text messages	**Ref (yes)**							
	No	-0.3351	0.1200	7.7960	0.0052	0.715	0.565	0.905
Family size	**Ref (10+)**							
	1-4	-0.0290	0.0719	0.1621	0.6872	0.971	0.844	1.119
	5-9	-0.0261	0.0610	0.1834	0.6685	0.974	0.864	1.098
Visited health Facility	**Ref (yes)**							
	No	-0.4685	0.0293	254.9991	<.0001	0.626	0.591	0.663
Heard radio Last 12 month	**Ref (yes)**							
	No	-0.3038	0.0394	59.5508	<.0001	0.738	0.683	0.797

Heard TV Last 12 month	**Ref (yes)**							
	No	-0.1293	0.0538	5.7729	0.0163	0.879	0.791	0.976
Visited by Fieldworker	**Ref (yes)**							
	No	-0.2988	0.0312	91.8559	<.0001	0.742	0.698	0.788
Desire To more children	**Ref (other)**							
	Want more	0.2889	0.0835	11.9723	0.0005	1.335	1.133	1.572
	undecided	0.3759	0.1039	13.0970	0.0003	1.456	1.188	1.785
	Want no more	1.2278	0.0806	232.1317	<.0001	3.414	2.915	3.998
Age of women	**Ref (40-49)**							
	15-29	1.5052	0.0492	936.3189	<.0001	4.505	4.091	4.961
	30-39	1.1061	0.0365	919.0221	<.0001	3.023	2.814	3.247
Women working	**Ref (yes)**							
	No	-0.2227	0.0306	52.9996	<.0001	0.800	0.754	0.850
	Ref(rich)							
Wealth index	Poor	-1.0195	0.0380	721.5272	<.0001	0.361	0.335	0.389
	Medium	-0.0608	0.0447	1.8517	0.1736	0.941	0.862	1.027
Marital status	**Ref (other)**							
	Single	0.0885	0.2296	0.1487	0.6998	1.093	0.697	1.713
	Married	1.4501	0.0631	527.3253	<.0001	4.263	3.767	4.825

*Ref=Reference Category *=significant at 5% level of significance*

As show in the table 4.3, the multinomial logistic regression model analysis of user family planning relative to non-user showed that Number of living children, Heard family planning by text message on mobile phone, Family size, Type of place of residence, Women education level, Religion, Visited health facility last 12 month, Heard family planning on radio last 12 month, Heard FP on TV last 12 month, Visited by field worker last 12 month, Desire for more children, Age group of women, Women currently working, Currently marital status and Wealth index had significant effect.

Table 4.3 Parameter estimation of MNLRT for the status of intend to use later relative to does not intend to use later

Analysis of Maximum Likelihood Estimates								
Parameter	Category	Estimate	SE	Wald	P- value	OR	95% c-interval	
							lower	upper
Intercept		-4.7356	0.3414	192.3880	<.0001			
Place of Residents	**Ref (Urban)**							
	Rural	-0.6075	0.0534	129.1882	<.0001	0.545	0.491	0.605
Women Education Level	Ref (higher)							
	Uneducated	-0.0411	0.1122	0.1341	0.7142	0.960	0.770	1.196
	Primary	0.3745	0.1113	11.3101	0.0008	1.454	1.169	1.809
	Secondary	0.1846	0.1219	2.2942	0.1299	1.203	0.947	1.527
Religion	**Ref (other)**							
	Orthodox	0.1898	0.1006	3.5630	0.0591	1.209	0.993	1.472
	Catholic	-1.2943	0.2448	27.9620	<.0001	0.274	0.170	0.443
	Protestant	-0.1456	0.1025	2.0197	0.1553	0.864	0.707	1.057
	Muslim	-1.0006	0.0992	101.7884	<.0001	0.368	0.303	0.447
Sex of House Hold head	**Ref (female)**							
	Male	0.5006	0.0406	152.2037	<.0001	1.650	1.524	1.786
Number of Living children	**Ref(8+)**							
	0-3	0.1823	0.0621	8.6087	0.0033	1.200	1.062	1.355
	4-7	-0.0857	0.0498	2.9594	0.0854	0.918	0.832	1.012
FP by Text messages	**Ref (yes)**							
	No	-0.0324	0.1327	0.0595	0.8073	0.968	0.746	1.256
Family	**Ref (10+)**							

Size	1-4	-0.3548	0.0691	26.3744	<.0001	0.701	0.613	0.803
	5-9	-0.1294	0.0567	5.2157	0.0224	0.879	0.786	0.982
Visited health facility	**Ref (yes)**							
	No	-0.4506	0.0289	242.6604	<.0001	0.637	0.602	0.674
Heard FP on radio	**Ref (yes)**							
	No	-0.2980	0.0415	51.6313	<.0001	0.742	0.684	0.805
Heard on TV	**Ref (yes)**							
	No	-0.1777	0.0591	9.0382	0.0026	0.837	0.746	0.940
Visited by Fieldworker	**Ref (yes)**							
	No	-0.2432	0.0313	60.4430	<.0001	0.784	0.737	0.834
Desire To more children	**Ref (other)**							
	Want more	2.7929	0.2725	105.0690	<.0001	16.328	9.572	27.85
	Undecided	2.9353	0.2782	111.3132	<.0001	18.826	10.91	32.47
	Want no more	3.4770	0.2719	163.4999	<.0001	32.364	18.99	55.14
Age of women	**Ref (40-49)**							
	15-29	2.1722	0.0510	1814.0169	<.0001	8.778	7.943	9.701
	30-39	1.6650	0.0403	1707.9129	<.0001	5.286	4.884	5.720
Women Work	**Ref (yes)**							
	No	-0.0476	0.0311	2.3452	0.1257	0.954	0.897	1.013
Wealth Index	**Ref(rich)**							
	Poor	-0.3936	0.0387	103.2595	<.0001	0.675	0.625	0.728
	Medium	0.1153	0.0474	5.9251	0.0149	1.122	1.023	1.231
Marital status	**Ref (other)**							
	Single	0.6559	0.1940	11.4343	0.0007	1.927	1.317	2.818

	Married	0.8637	0.0595	210.9173	<.0001	2.372	2.111	2.665

*Ref=Reference Category *=significant at 5% level of significance*

As shown in Table 4.5 the model fitted for women's intends to use family planning methods relative to does not intends to use later revealed that variables such as Family size, Type of place of residence, Women education level, Religion, Visited health facility last 12 month, Heard family planning on radio last 12 month, Heard FP on TV last 12 month, Visited by field worker last 12 month, Desire for more children, Age group of women, Currently marital status and Wealth index had significant effect.

Goodness of Fit the of model

After a multinomial logistic regression model has been fitted, it is necessary to see the adequacy of the fitted model. The most commonly used techniques are Pearson's Chi-square, and Deviance goodness of fit test.

Table 4.4 Goodness of Fit Statistics

Deviance and Pearson Goodness-of-Fit Statistics			
Criterion	Value	Value/DF	Pr > ChiSq
Deviance	12234.4787	5.205	0.3105
Pearson	11638.9069	4.9105	0.6412

Table 4.6 showed that there is enough evidence to conclude the model adequately fits the data well. Pearson Chi-square (p-value =0.6412) and deviance (p-value =0.3105) showed that multinomial logistic regression model with predictor variables indicated a good fit.

Discussion

This study was intended to identify Scio-economic, demographic and other proximate determinants of family planning use and intention among women of reproductive age(15-49) based on Ethiopian Demographic and Health Survey (EDHS 2016) data. Since the response variable contain three categories then the analysis was done by taking one category as reference and separate model for each of the remain three categories of response variables. The results which are obtained are discussed as follows.

At first the study included seventeen predictor variables that were categorized under socioeconomic, demographic and proximate characteristics. The descriptive analysis of the study revealed that only 23.9 percent of the sample of women were using family planning, 21.7 percent were intend to use later and 54.4 percent were not intend to use family planning method.

From the finding of this study the factor that determine family planning use status were identified those are demographic factor, socio-economic and other proximate factor.

Under the demographic factors; desire for more children, number of living children were significantly associated with family planning status among Ethiopian women. The women who were desire to have more children were less likely to use family planning and intend to use family planning method than women who does not desire to have more children. The result of this study showed that women who had four or more children were more likely to use family planning method than women who had no children and number of children were three and less. This could be because many women with larger number of living children were either on the limit to achieve or on achieving their preferred family size. Therefore, these women are likely to abandon pregnancy, showing interest in the adoption of family planning methods.

Under socioeconomic factor place of residence, exposure to mass media, religion, educational level of women and wealth index were found significantly associated with family planning use status. Marital status is one of the factors that had significant association with FP in this study. Women who were never in a union and married women were more likely to practice family planning compared to those women who were no longer living with partner. This study are consistent with others studies: (Tekle G. et al .2016).
The study also found women who were not visited by a family planning worker during the last 12 months were less likely to practice family planning than those who were visited during the last 12 months before the survey. This result is consistent with studies made in Ethiopia and India (Antenane, 2002 and Laya, 2012). And women who were not visited health facility a during the last 12 months before survey were less likely to practice family planning method than those who were visited during the last 12 months before the survey.

Women's level of education was found to be a basic determinant of family planning use. The results indicated that family planning use and intention increase as women's educational level increased. The was similar with previous studies done by (Dwivedi and Sundaram, 2000; Ainsworth et al. 1996). Education also exposed women to information, empowers women, made them more likely to be employed outside their home environment, and created more awareness of their own health and the health of their children.

Religion of women was also found one of the determinants of family planning use. The study found that there is religious disparity in accepting family planning use. This could be due to the difference in perception of different religions concerning to marriage, reproductive behavior, and family planning methods. The other possible reason might be the fact that some religious societies assumed that a women"s worth is measured in terms of her children. Even the use of family planning methods is not accepted by some cultures and religious societies. An important strategy to minimize this disparity is educating women through their religious leaders about the

importance of family planning use. This result is consistent with studies made in Nigeria (Olugbenga Bello AI, Abodunrin OL (2011).

The results of this study have indicated that age of a woman is an important variable which is found to be a determinant of family planning usage. The highest proportion of family planning usage is observed in the age group 15-29, which indicates that most of these women's were in their childbearing age group. On the other hand, the lowest proportion of family planning method usage in the age group 40-49. The results showed that women in the adolescent reproductive age group are better in family planning usage as compared to women in the oldest age group this is explained by the fact that adolescent women are at high risk of unintended pregnancy. This finding was related with the findings of Hamdalla and Markos (2017) and Arega (2017).

The findings in line lemma et al. (2016) variable mass media exposure were significant determinant of family planning use status. The finding of this study showed that women who heard family planning methods on radio, TV last 12 month before the survey had improved their level of family planning use. Women with information about family planning methods through radio, on TV in the last month can create awareness about family planning.

The study also showed significance variation on family planning use and intention among residence of women. That is, women residing in rural areas were less likely to use family planning method than urban women. This result was the same with the findings Juniper Russo (2014) and Mtuy and Mahande (2015) they had conducted research works on Traditional and modern Methods of Family Planning and they hypothesized that urban women were more likely to use family planning methods than rural women.

Another finding of this study was that women currently working were more likely to use family planning methods than women who were not working. The results of this study also revealed that wealth index is an important variable which significantly affects the use of family planning methods. According to the findings of this study, women with low household economic status are at a lower level of family planning method usage as compared to women residing in medium and rich household economic status. This shows that as the household economic status of women increases their family planning method usage also increases. The reason could be that poor women may perceive children as a source of income, thus motivating them to have more children (Karki (1982)). The finding is also consistent with Hamill et al., (1990) who hypothesized that the wealth of the household may also be important because of its correlation with education and since wealth may have effects on desired family size and contraceptive use effectiveness. Another reason could be that the poorest people have less access to education and family planning methods.

Conclusion

This study is aim to identify determinant factors of family planning practice among women in Ethiopia using multinomial logistic regression. The descriptive results show that Out of the

41392 women of reproductive age(15-49), 23.9% were use family planning, 21.7% intend to use later and 54.4%ndoes not intend to use did observed at the time of the survey. Moreover the study revealed that the predictor variable such as place of residence, age of a woman, religion of a woman, educational level of women, wealth index, heard FP method by TV last 12 month before survey, visited health facility last 12 month before survey, heard FP method on radio last 12 month before survey, marital status, desire to more children , women currently working , number of living children of women and visited by FP worker in last 12 months before the survey were found to be significant predictors for women's family planning practice status at 5%level of significance found to be an important determinant factor of family planning.

Recommendations

- Better educational level contributes to increased knowledge of family planning use; so government and non-government organizations should focus on educating women and improving employment opportunities for women as these are effective means of Advancing family planning acceptance and increasing the prevalence of family planning use.
- Promote family planning by providing better information, supply, access and services about family planning as well as good health centers, especially in rural.
- More family planning workers should be trained so as to increase the number of family planning workers as they contribute to the success of family planning in Ethiopia.
- Further study is required to assess the quality of family planning services in Ethiopia.

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