Developing Country Studies
ISSN 2224-607X (Paper) ISSN 2225-0565 (Online)
Vol.13, No.3, 2023

Determinants of Modern Hormonal Contraceptive Methods Utilization among Women within Reproductive Age Group in Dire Dawa City, Ethiopia

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Abstract
Modern family planning methods are widely believed to influence fertility reduction worldwide. Family planning had a clear effect on the health of women, children, and families worldwide especially those in developing countries. It has been shown that there are many instances in which women might discontinue contraception or switch methods that put women at risk of unwanted pregnancies. In addition, studies showed that in countries with moderate to high contraceptive prevalence, the majority of unintended pregnancies are the result of contraceptive discontinuation or failure. This study intends to assess and identify determinants of reversible modern hormonal contraceptive method utilization among women of reproductive age group in Dire Dawa city, Dire Dawa Administration, Eastern Ethiopia. A cross-sectional study design was employed. A total of 811 women one year history of modern hormonal contraceptive method usage was studied. A stratified random sampling method was used to select the study subjects. Data was collected using structured questionnaire and to analyze the data descriptive statistics and binary logistic regression was employed. *Result*. This study showed that 574 (70.8%) of them continue using the method that they used before one year without changing. However, 237 (29.2%) of women discontinued using the method within a year. Switching account 97 (40.9%) of the discontinuation. Factors such as: age, number of children, who made the decision on choice of the used method, the type of contraceptive method used and taking training/ counseling before using the method were found to be significant at 5% level of significance. Women who are young, have no or small number of children and not the decision maker on the choice of the method are more likely to discontinue. Whereas women who didn't took training/counseling are less likely to discontinue. And compared to women who used implant those, women who used pills and injectables are more likely to discontinue. This study showed the factors that contribute to utilization of modern contraception methods.
Keywords: modern hormonal contraceptive method; binary logistic regression
DOI: 10.7176/DCS/13-3-01
Publication date: March 31st 2023

I. Introduction

The World Health Organization (WHO) estimated that 210 million women get pregnant each year and that about two-thirds, deliver live infants globally. The remaining one-third of pregnancies ends in still births, miscarriages and induced abortions (WHO, 2011).

According to the 2016 Ethiopia Demographic and Health Survey (EDHS), fertility in Ethiopia has declined from an average of 5.4 children per woman in 2005 to 4.8 children per woman in 2011 and 4.6 children per woman in 2016. The survey also revealed that in 2016 the total fertility rate (TFR) is 4.6 children per woman. However, the total wanted fertility rate is 3.6 children per woman.

Modern family planning methods are widely believed to influence fertility reduction worldwide. Family planning had a clear effect on the health of women, children, and families worldwide especially those in developing countries (Lakew, 2013; Darroch, 2008).

Contraceptive prevalence at the global level will need to be at least 66%–75% in the more developed regions and 67% in the less developed regions to attain the projected decline in fertility by the year 2025 (MOH (2011)). Regarding modern contraceptive method, the 2016 Ethiopia Demographic and Health Survey (EDHS) revealed that Modern contraceptive use by currently married Ethiopian women has steadily increased over the last 15 years, 6% of women using modern contraceptive method in 2000, 14% in 2005, 27% in 2011 and 35% in 2016. The survey also showed that in Dire Dawa among married women the contraceptive prevalence rate is 29%. This figure seems fair compared to the lowest 1% in Somali region and the highest 50% in Addis Ababa. However all of the regions didn't meet the expected 66% prevalence rate set by Ethiopian Ministry of Health in 2011 (MOH, 2011).

More than one-third of all contraceptive users (35%) discontinued use within 12 months. The most common reason for stopping a method was the desire to become pregnant (42%), followed by method-related health concerns or side effects (18%). Discontinuation rates are highest for the pill (70%) followed by injectables (38%), IUD (13%) and lowest for implant (11%) (CSA, 2016).

In countries with moderate to high contraceptive prevalence, the majority of unintended pregnancies are the

result of contraceptive discontinuation or failure (Barden-O'Fallon et al, 2011). Contraceptive discontinuation is a public health concern because of its association with negative reproductive health outcomes. Discontinuation rate is increasing with a remarkable figure in Ethiopia. But reasons for discontinuing the method were not well addressed in different studies within the country. Dynamics of contraceptive use; continuation, switching and failure are important markers of how well programs are meeting the FP needs of women and couples. Studying the dynamics of contraceptive use can reveal problems in the use of contraceptive technologies and the gaps in the provision of services and, therefore, provide guidance essential for improving services is very important (Bekele, 2015).

There are several studies conducted on the socio-economic, cultural and physical barriers women have to overcome in order to adopt a modern contraceptive method. However, somewhat less attention is given to what happen after a woman has overcome these barriers and adopts a method (Bailey and Claire, 2009). In addition, it has been shown that there are many instances in which women might discontinue contraception or switch methods that put women at risk of unwanted pregnancies (Ali and Cleland, 2010). Therefore, to decrease the prevalence of unmet need of contraception, one must uncover the extent to which and the reasons why contraceptive users become non-users. Therefore, the purpose of this study was to assess and identify determinants of reversible modern hormonal contraceptive method utilization among women of reproductive age group in Dire Dawa city, Dire Dawa Administration, Eastern Ethiopia.

II. Material and Methods

2.1. *Study area*. The study was conducted in Dire Dawa city. Dire Dawa city is located in eastern part of Ethiopia around 517 km to the east of the capital Addis Ababa. The city is one of the oldest cities that established as a result of the start of the former Ethio-France rail way transportation company in the year 1903.

2.2. *Study Dataset*. This study used part of the original dataset collected by the researchers with a fund obtained from Dire Dawa University Research Affairs. The data was collected between January-March 2017. Since this study is about MHCM utilization, this study used the information on a MHCM used by women at a year before the time of survey.

2.3. *About the original Dataset*. The original dataset was a cross-sectional data that contain five years (2012-2017) histories of women who use MHCM. Stratified random sampling technique was used to select the study participants. There are 9 kebeles in Dire Dawa city. Thus, sample was taken from each kebeles and proportional allocation was used to set the required total number of respondents from each kebeles.

Sample size was determined in such a way that first, the approximate total population size (modern hormonal contraceptive methods user women) was taken from Dire Dawa regional health bureau that was 21500 user women in 2016. The approximate total modern hormonal contraceptive methods (MHCM) user women were the sum of users in each one of the 9 kebeles in Dire Dawa city. Then, the sample size formula stipulated in Cochran (1997) was used to get the desired sample size. Since, the researchers had no preliminary information on the values of the population proportion of women who discontinue/switch using MHCM (P) and its complement Q=1-P, pilot survey on 40 MHCM user women was conducted and the researchers used the results to approximate the values as P =0.32 and Q = 0.68. The researchers also set the level of significance $\alpha = 0.05$ and allow margin of error d=0.03. Then, the sample size became 929.

Sample unit was obtained by using systematic sampling technique. That is the study subjects' household was selected through systematic sampling technique at every "k^{th}" interval, whereas the first house hold was selected by lottery method, then continuing to every k^{th} house hold; if there was no respondent in the household, the collection continued to the next house until the desired sample size was attained.

A self-administered questionnaire that addresses several issues related to factors of discontinue/switch using MHCM was prepared from related studies and administered to the sample respondents. A pilot test was carried out to test the validity and reliability of the questionnaire and some correction was taken. Eighteen well trained female health related workers with three supervisors including the researchers were assigned to collect the required data through face to face interview. Before data collection, data collectors explained the purpose of conducting this research and consent was granted from the participants.

Approval and letter of permission was obtained from Research and Technology Interchange Affairs Directorate of Dire Dawa University and Dire Dawa Administration Health Bureau before the commencement of the study. Informed consent was sought and obtained from each participant before the commencement of this study. In order to ensure the confidentiality of the information, all data were kept in secret and coded in anonymity.

2.4. Variables of the Study. The dependent variable of this study was modern hormonal contraceptive method utilization status (0 = if a woman continue using the method that she used before a year ago without changing the method and 1= if a woman discontinue using the method that she used before a year ago or switch to other method).

The independent variables were women's age, marital status, educational status, average monthly income in Ethiopian birr, number of children and time taken to travel from home to nearest health center to get family planning services by walking at a time of survey. Type of modern hormonal contraceptive method used, ultimate method choice decision made (not by the user woman, by the user woman), taking training/counseling before using the method (no, yes).

2.5. Data Analysis. Descriptive statistics tools such as frequency and percentage was used to present the collected data and to point out special features. Chi-square test was employed to test whether there are statistically significant association between utilization status and independent factors of utilization status. Binary Logistic Regression model was fitted to identify significant predictor variables. The level of significance for all the inferential statistics was set at $p<0.05$.Statistical package for Social Science (SPSS) version 22 was used.

III.Results

As mentioned earlier, this study used the information on a MHCM used by women at a year before the time of survey. At a year before the time of survey, out of the total 929 women found in the original dataset, 14 of the women were found to be pregnant due to method failure, 18 discontinued due to infecundity and 86 of the women discontinued due to a desire to get pregnant. Thus, the analysis was carried out using the remaining 811 subjects.

Out of the total study women 574 (70.8%) of them continue using the method that they used before one year without changing. However, 237 (29.2%) of women discontinued using the method that they used before a year ago. Switching account 97 (40.9%) of the discontinuation. The main reason for contraceptive discontinuation were a desire to have child (22.8%), fear of observed side effects of the method used (20.3%), want more effective method (13.9%), fear of perceived side effect (11.4%), fear of infertility (9.7%) and Health worker recommendation (8%). Husband influence, method failure, fear of method failure, other health related problem and religion influence all accounts (13.9%) of the reasons (See Table 1).

Table 1: Reason for discontinuation of MCM

Reason	Frequency	Percentage
Desire to have a child	54	22.8
Method failure	6	2.5
Fear of infertility	23	9.7
Fear of method failure	4	1.7
Husband influence	14	5.9
Health worker recommendation	19	8
Fear of observed side effects	48	20.3
Fear of perceived side effect	27	11.4
Want more effective method	33	13.9
Health related problem	6	2.5
Religion influence	3	1.3
Total	237	100

Regarding age 101 (12.5%) were aged less than 25 years, in this age group out of the 101 women 58 (57.4%) of them discontinue using the method within a year. Whereas, 219 (27%) of the respondents were at least 35 years old and out of the 219 women 36 (16.4%) of them discontinue using the method within one year (See Table 2).

Regarding educational level 54 (6.7%) respondents have no formal education, 51 (6.3%) respondents were able to read and writing, 219 (27%) respondents achieved primary level education, 248 (30.6%) respondents achieved secondary level education and the remaining 239 (29.5%) respondents have college diploma or above. The majority of women, 725 (89.4%) of them were married. Out of the total study subjects, the average monthly income of 659 (81.3%) of women were below 2000 Ethiopian birr. Whereas, 56 (6.9%) of women earn more than 4000 Ethiopian birr in monthly basis (See Table 2).

Out of the total study subjects 61 (7.5%) of women have no child, 641 (79.0%) of women have 1-3 children and the remaining 109 (13.4%) of women have more than 3 children. Out of the 61 women who have no child 39 (63.9%) of them discontinue using the method within a year. Whereas out of the 109 women who have more than 3 children, only 13 (11.9%) of them discontinue using the method within a year (See Table 2).

Out of the total study women 752 (92.7%) of them made the ultimate decision on method choice. Whereas, 59 (7.3%) of them were not the one who decide the method choice. Among the 59 women who were not the decision maker, 34 (57.6%) of them discontinue using the method within a year (See Table 2).

Out of the total study subjects 169 (20.8%) of women used Pills, out of the 169 Pill user women 73 (43.2%) of them discontinue using the Pills. Out of the total study subjects 367 (45.3%) of women used Injectables, out of these 116 (31.6%) of women discontinue using the Injectables. Whereas out of the 229 (28.2%) women who used Implant, only 35 (15.3%) of them discontinue using the method within a year (See Table 2).

Out of the total study subjects 579 (71.4%) of women took Training/ counseling before they used the method.

Out of these 579 women who took Training/ counseling before they used the method, 189 (32.6%) of them discontinue using the method within a year. Regarding time taken to the nearest family planning center slight differences on utilization status was observed (See Table 2).

Table 2: Descriptive summary of variables of the study

Independent Variables	Frequency (%)	MHCM Utilization status	
		Continued	Discontinued
		Frequency(%)	Frequency(%)
Age in years			
<25	101 (12.5)	43 (42.6)	58(57.4)
25-34	491 (60.5)	348 (70.9)	143(29.1)
>=35	219 (27.0)	183 (83.6)	36 (16.4)
Educational level			
None	54(6.7)	43 (79.6)	11 (20.4)
Read&write	51(6.3)	41 (80.4)	10(19.6)
Primary	219(27.0)	149 (68.0)	70(32.0)
Secondary	248(30.6)	163 (67.7)	80(32.3)
diploma/above	239(29.5)	173 (72.4)	66(27.6)
Marital status			
NotMarried	86(10.6)	55 (64.0)	31(36.0)
Married	725(89.4)	519(71.6)	206(28.4)
Monthly income			
<2000 birr	659 (81.3)	465 (70.6)	194 (29.4)
2000-4000	96 (11.8)	71 (74.0)	25(26.0)
>4000 birr	56 (6.9)	38 (67.9)	18(32.1)
No of children			
0	61 (7.5)	22 (36.1)	39(63.9)
1-3	641 (79.0)	456 (71.1)	185(28.9)
> 3	109(13.4)	96 (88.1)	13(11.9)
Method chose			
Not by the user	59 (7.3)	25 (42.4)	34 (57.6)
By the user	752(92.7)	549(73.0)	203 (27.0)
Type of method			
Pills	169 (20.8)	96 (56.8)	73 (43.2)
Injectables	367(45.3)	251(68.4)	116 (31.6)
IUCD	46 (5.7)	33 (71.7)	13 (28.3)
Implant	229(28.2)	194(84.7)	35 (15.3)
Training/ counseling			
No	232 (28.6)	184 (79.3)	48 (20.7)
Yes	579 (71.4)	390(67.4)	189 (32.6)
Time taken			
<10minute	88 (10.9)	62 (70.5)	26 (29.5)
10-20	586 (72.3)	420 (71.7)	166 (28.3)
>20minutes	137(16.9)	92(67.2)	45 (32.8)

Before proceed to model fitting that contains several (multiple) independent variables, one should first check the significance of incorporating each one of the independent variables. If a given independent variable is insignificant in univariate analysis, then it is unnecessary to incorporate the variable in model fitting that contains multiple independent variables. Since the dependent variable of this study modern hormonal contraceptive method utilization status was dichotomous variable, here in addition to univariate analysis, to incorporate more variables less conservative chi-square test with 10% level of significance was employed. Chi-square test of association was employed to test whether there are statistically significant association between utilization status and each of the independent variables. Independent variables that are found to be significant in chi-square test were included in the Binary Logistic Regression model.

The results of chi-square test showed that variables such as age, number of children, who made the decision on choice of the used method, the type of contraceptive method used and taking training/ counseling before using the method were found to be significantly associated with modern hormonal contraceptive utilization status. However, no statistically significant association were found between modern hormonal contraceptive utilization status and variables such as educational level, marital status, time taken from home to nearest health center and average monthly income (See Table 3).

Table 3: Summary result of Chi-square test

Independent Variables	Chi-square calculate	Df	P value
Age	56.149	2	<0.001*
Educational level	6.524	4	0.163
Marital status	2.165	1	0.141
Monthly income	0.715	2	0.699
No of children	51.341	2	<0.001*
Method chose by	24.820	1	<0.001*
Type of method	38.494	3	<0.001*
Time taken	1.101	2	0.577
Training/counseling	11.441	1	0.001*

*significant at 0.1 level of significance

Binary Logistic Regression model was fitted to identify significant predictor variables. All independent variables that were found to be significantly associated with contraceptive utilization status in chi-square test were included in the model.

The results showed that variables such as age, number of children, who made the decision on choice of the used method, the type of contraceptive method used and taking training/ counseling before using the method were found to be significantly associated with modern hormonal contraceptive utilization status at 5% level of significance (See Table 4).

The estimated odd ratio of woman who is less than 25 years old is 4.664 implying that the risk of discontinuation of modern hormonal contraceptive method for woman who is less than 25 years old is 366.4% higher than woman who is at least 35 years old controlling for the other covariates in the model. The estimated odd ratio of woman whose age is between 25-34 years old is 1.676 implying that the risk of discontinuation of modern hormonal contraceptive method for woman whose age is between 25-34 years old is 67.6% higher than woman who is at least 35 years old controlling for the other covariates in the model (See Table 4).

The estimated odd ratio of a woman who has no child is 4.953. This shows that a woman who has no child has a 395.3% higher risk of discontinuation of modern hormonal contraceptive method than women who has more than three children (reference group) controlling for other covariates in the model (See Table 4).

Table 4: Results of Binary Logistic Regression model

Variables	β	SE	Exp(β)	P value
Age				
<25	1.540	0.306	4.664	<0.001*
25-34	0.517	0.233	1.676	0.027*
>=35			1	
No of child				
0	1.600	0.441	4.953	<0.001*
1-3	0.616	0.338	1.852	0.068
> 3			1	
Method chose				
Not by the user	1.244	0.301	3.470	<0.001*
By the user			1	
Type of method				
pills	1.413	0.255	4.106	<0.001*
injectables	0.779	0.228	2.179	0.001*
IUCD	0.650	0.410	1.915	0.113
Implant			1	
Training/cou				
no	-0.603	0.202	0.547	0.003*
yes			1	
Constant	-2.761	0.365		<0.001*

*significant at 0.05 level of significance

The estimated odd ratio of a woman who did not make a decision on the choice of the method is 3.47. This shows that the risk of MHCM discontinuation for woman who did not make a decision on the choice of the method is 3.47 times more likely than a woman who made a decision method choice controlling for other covariates in the model (See Table 4).

The estimated odd ratio of a woman who used pills is 4.106 implying that the risk of contraceptive discontinuation for woman who used pills is 310.6% higher than a woman who used implant (reference group) controlling for other covariates in the model. The estimated odd ratio of a woman who used injectables is 2.179

implying that the risk of contraceptive discontinuation for woman who used injectables is 117.9% higher than a woman who used implant controlling for other covariates in the model (See Table 4).

The estimated odd ratio of a woman who didn't take training/counseling before taking the method is 0.547 implying that the risk of discontinuation of modern hormonal contraceptive method for a woman who didn't take training/ counseling before taking the method is 45.3% less likely than a woman who took training/ counseling before taking the method controlling for the other covariates in the model.

IV. Discussion

This study found that variables such age, number of children, who made the decision on choice of the used method, the type of contraceptive method used and taking training/ counseling before using the method are significantly associated with discontinuation of modern hormonal contraceptive method. However, variables such as educational level, marital status, time taken from home to nearest health center and average monthly income were found to be statistically insignificant.

Regarding to the variables that are found to be insignificant, the result of this study disagree with a finding of a study conducted in Jimma, Southwest Ethiopia that found marital status and educational status are significant predictors of contraceptive discontinuation (Yideta et al, 2017). The result also disagree with a finding of a study conducted in Northern India that found time taken from home to nearest family planning center is significantly associated with contraceptive discontinuation (Fengyu et al, 1999).

This study showed that the risk of discontinuation of modern hormonal contraceptive method for younger woman is higher than old woman who are at least 35 years old. This result contradicts with studies that showed women who discontinued are largely concentrated between the ages of 25-34 years (Yideta et al, 2017; Sian et al, 2011).

This study found that the risk of discontinuation of modern hormonal contraceptive method for woman who have no child or who have 1-3 children are higher than woman who has more than 3 children. This may be due to the desire to have a child. This result agree with a study found that women with many children would be less likely to stop using than women with few children (Bailey and Claire, 2009).

The current study also showed that the risk of discontinuation for woman who used pills or injectables is higher than a woman who used implant. Although in this study condom users were not included, the result of this study agrees with studies found that failure rate was highest for condom users followed by Pills and injectibles but none for the long acting methods (implanol and IUD) (Bekele et al, 2015;Yideta et al, 2017). Similar result also found in a study conducted in Ghana that showed that Pill users were more likely to discontinued (Bailey and Claire, 2009).

This study revealed that the risk of MHCM discontinuation for a woman who did not make a decision on the choice of the contraceptive method higher. This finding is in agreement with (Bekele et al, 2015).

This study also found that the risk of discontinuation of modern hormonal contraceptive method for a woman who didn't take training/counseling before taking the method is less likely than a woman who took training/ counseling before taking the method. This could be due to women who didn't take training/counseling before taking the method are less likely to look for alternatives. Or as a reviewed studies from Niger and Gambia concluded that women who felt that they had not been properly counseled were more likely to discontinue their use (Rao and Mohanam, 2003).

V. Conclusion and Recommendations

The findings of this study imply that variables such as age, number of children, who made the decision on choice of the used method, the type of contraceptive method used and taking training/ counseling before using the method are significantly associated with discontinuation of modern hormonal contraceptive method. Women who are young are more likely to discontinue. Women who have no child or small number of children are more likely to discontinue compared to women who have more than three children. And women who did not make a decision on the choice of the contraceptive method are more likely to discontinue. Whereas women who didn't took training/counseling are less likely to discontinue. And compared to women who used implant those, women who used pills and injectables are more likely to discontinue.

Thus, in order to reduce discontinuation the researchers recommend the following. The significance of the type of method used may indicate that a woman didn't take what she prefers due to either by provider bias or by lack of the preferred method. Provider bias occurs when service providers / health workers believe that they are better qualified to choose the most appropriate method for their client, or if a woman shared provider decision and she does not understand why she is using a particular method. Thus in family planning interventions effort needs to be exerted to reduce provider bias by providing appropriate training to providers/ health workers.

High discontinuation in pills and injectables users may show that women seek a long term contraceptive method. Thus, in interventions it will be better if family planning providers to make sure all methods are available.

The significance of training/counseling before using may indicate that a woman is either not properly

counseled or the training/counseling was not intensive and effective. Thus, it will be better if the current training/counseling programs are improved and check the effectiveness of the programs.

Data Availability

The data to support the findings are available from the author upon request.

Acknowledgements

First of all, I would like to thank Dire Dawa University Research Affairs for founding this study. I also need to express our appreciation to Dire Dawa University, College of Natural and Computation Sciences and Department of applied Statistics for allowing us to conduct this study. I would like to acknowledge the Dire Dawa Administration Health Bureau and the Health centers for their warm welcoming and cooperation in facilitating the data collection process. I am also very grateful for all people who participated as enumerators and as supervisor in data collection process.

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