Original Research Article

PREVALENCE OF LONG-ACTING REVERSIBLE CONTRACEPTIVE METHODS AND FACTORS AFFECTING ITS USE AMONG MARRIED WOMEN IN AKASTA TOWN, NORTH-EAST ETHIOPIA

Abstract

Introduction: Long acting contraceptive is a human right and is essential to women's empowerment. It is essential to reduce poverty, promote economic growth, raise female productivity, lower fertility and improve child survival and maternal health. Even though some long acting reversible contraceptive methods are the world's most prevalent form of reversible contraception, the utilization is very low in sub-Saharan Africa.

Objectives: To assess the prevalence and factors affecting use of long acting contraceptive methods in Akasta Town, North East Ethiopia.

Methods: A community based cross-sectional study was conducted on 422 women of reproductive age to find out the prevalence and factors affecting use of long acting contraceptive methods in Akasta Town, North East Ethiopia from March to May 2016.. The actual respondents were selected by systematic sampling method at household level. Pretested and structured questionnaires were used to collect data. Data entry, editing and clearance was done using Epi info version 3.5.1 database. Finally, analysis was done using SPSS version 20.0.

Result: The prevalence of use of long acting contraceptives in the study area was found to be 33.6% and implants were the most commonly used methods. One hundred thirty one (46.8%) of respondents did not use these methods because of inadequate information provided for them. Two hundred eighty one (66.6%) of respondents said that they knew at least one type of long acting methods and Implants were widely known which accounts 139 (49.5%) of respondents.

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Age, husband's educational status, knowledge of long acting reversible contraceptives and attitude towards these methods were significantly associated with use of these contraceptives.

Conclusion: The study showed that the prevalence of long acting reversible contraceptives in the study area was low. Only 142(33.6%) of respondents ever used any type of these methods in their life time and implants were the most commonly used method. Age, husband's educational status, knowledge of long acting reversible contraceptives and attitude towards these methods were significantly associated with use of long acting reversible contraceptives.

Key words: Long acting contraceptives, Akasta Town, Knowledge, Attitude, practice

Introduction

According to world health organization report an estimated 358,000 maternal deaths occurred worldwide in 2008, developing countries account for 99% (355,000) of the deaths. Sub-Saharan Africa and south Asia accounted for 87% (313,000) of global maternal deaths. Ethiopia is one of the sub-Saharan African countries with highest maternal mortality rate which is 676 maternal deaths per 100,000 live births. The vast majority of maternal and new born deaths can be prevented with proven interventions to ensure that every pregnancy is wanted by using the most effective long acting reversible contraceptive methods and by making every birth safe (7,8,9).

Thus, long acting reversible contraceptives are family planning methods that prevent unwanted pregnancy for at least three years and when removed return of fertility is prompt. It includes the intrauterine contraceptive devices and the sub dermal implants. Long acting reversible contraception methods are convenient for users and effectively prevent pregnancy and also cost effective for programs overtime (1, 2).

Family planning has the power to save lives, yet today, more than 200 million women in the developing world don't want to be pregnant but aren't using modern contraception especially long acting family planning methods such as implants, despite of meet their needs, can dramatically improve the health and well-being of women, families, and communities. Worldwide the contraceptive prevalence rate has been rising in a fast momentum, with the developing countries at the spotlight. Likewise, the utilization of long acting reversible

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contraceptive is increasing in some part of the world. Even though some long acting reversible contraceptive methods are the world's most prevalent form of reversible contraception, the utilization is very low in sub-Saharan Africa. As a part of sub-Saharan Africa, Ethiopia and its different regional states possess very small percent. Despite their great advantage and effectiveness, the acceptability of long acting reversible contraceptive methods is very low in some countries of the world including in more advanced countries. Most people have limited knowledge, poor attitude (perception of poor efficacy and perception of high side effects) and low practice of it [5, 6].

In Ethiopia knowledge of contraception is nearly universal. Currently, 28.6% married women are using modern contraception methods. In 2011 Ethiopian demographic health survey(DHS), the utilization of intrauterine device and implant was low, 2.1% and 3.4% respectively.

In the 2014 mini Ethiopian DHS report, the utilization of intrauterine device and implant is still low, 1% and 4.9% respectively In Amhara region the utilization of long acting reversible contraceptive is 0.2% for intrauterine device and 7.7% for implanon. When the two reports are compared, there is improvement in implants use but even decrease in intrauterine device use. This shows need of further study to asses factors that hinders use of these long acting contraceptive methods [7]. Therefore, this study was aimed to investigate the prevalence and factors affecting use of long acting contraceptive methods.

Methods and Materials

Study design and period

A community based cross-sectional study was conducted on 422 women of reproductive age to find out the prevalence and factors affecting use of long acting contraceptive methods in Akasta Town, North East Ethiopia, March to May 2016.

Sample size estimation

The sample size was computed by using single population proportion formula for finite population with 95% confidence level, prevalence of modern contraceptive use as 50% and marginal error of 2%.

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Study participant selection methods

Labeling of households in the study area was done prior to the actual study to construct sampling frame and to determine the total number of households found in the study area. The actual respondents were selected by systematic sampling method at household level.

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Data collection instrument and data quality assurance

Pretested and structured questionnaires were used and translation of instrument was made from English language to local Amharic language and back to English language. Questionnaires for each item were adapted from previously done similar studies. Semi structured questionnaire was employed to collect data. Data collectors were trained for one day on questions included in the questionnaire, on interviewing techniques and purpose of the study. Before conducting the main study, pretest was conducted on five percent of the total sample size (in Gimba town) which were not included in the main study. Based on the result, data collectors were reoriented and the questionnaire was modified accordingly.

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Data entry and Analysis

The questionnaires were checked for completeness and consistency and entered and edited in the computer for statistical analysis. Data were entered in to Epi Info version 3.5.1 database. Furthermore, the data editing and clearance was done on the same software. Finally, the data was taken to SPSS version 20.0 for the final analysis. Extreme observations and missing values were assessed and managed. The findings of the study were summarized and presented using tables, descriptive measures and statistical diagrams. Binary logistic regression was used to assess the independent effect of the predictors on the utilization of long acting reversible contraceptives. Statistical inferences were made by using chi-square test and the measure of association was the odds ratio. All covariates with nearly $p \leq 0.2$ in the bi-variable analysis or potential confounders were included in to the final model to obtain adjusted odds ratio and their 95% confidence intervals.

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Ethical consideration

The study was approved by the ethical review board of Wollo University, college of medicine and health sciences and a cooperation letter was obtained from Akasta district administrative office. Verbal consent was obtained from each study participants.

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Result

Socio-demographic characteristics of respondents

A total of 422 currently married women were participated making the response rate of 100%. From the total respondents 225(53.3%) were in the age group of 20-34. The mean age of the participants was 29.699 (± 9.1 SD) years with minimum of 16 years and maximum of 49 years (refer table -1).

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Table 1: Socio-demographic characteristics of long acting contraceptive users, Akasta town, March to May, 2016

Variables		Number	Percent (%)	Mean	Standard deviation (SD)
Age	15-19	87	20.6	29.699	9.11
	20-34	225	53.3		
	35-49	110	26.1		
	Total	422	100		
Current occupation	House wife	196	46.5		
	Merchant	85	20.1		
	Government employee	83	19.7		
	Student	58	13.7		
	Total	422	100		
Women Educational status	Unable to read & write	141	33.4		
	Primary school	113	26.8		

	Secondary and above	168	39.8		
	Total	422	100		
Husband Educational status	Unable to read & write	54	12.8		
	Primary school	172	40.8		
	Secondary and above	196	46.4		
	Total	422	100		

3.2 Reproductive characteristics of respondents

From all 422 currently married women 337(79.9%) of them give at least one birth. Eighty five (20.1%) of the participants had never given birth. Two hundred twenty seven (53.8%) of respondents had experienced unwanted pregnancy while 46.2% had never experienced it. Regarding history of abortion the majority of respondents (72.2%) said that they did not experienced abortion while the rest (26.8%) had experienced it (refer table-2).

Table 2: Reproductive characteristics of respondents, in Akasta town, March to May, 2016

Variables	Categories	Number	Percent
Age at first sex (n=422)	<18	198	46.9
	>=18	224	53.1
	Total	422	100
Give birth	Yes	337	79.9
	No	85	20.1
Age at first birth (n=337)	<18	85	25.2
	>=18	252	74.8
	Total	337	100
No. of children wish to have in the future (n=422)	No need	57	13.5
	1-2	109	25.8
	3-4	170	40.3
	5 or more	86	20.4
	Total	422	100
History of unwanted pregnancy (n=422)	Yes	227	53.8
	No	195	46.2

Have you experienced induced abortion (n=422)?	Yes	113	26.8
	No	309	73.2

3.3 Knowledge and practice of respondents on modern contraceptive methods

From the total of 422 respondents, majority of them, 365(86.5%) knew at least one method of short acting modern contraceptives while the rest 13.5% did not knew any methods. 336(79.6%) of respondents ever used one type of modern short acting contraceptives at least once in their life time.

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Two hundred eighty one (66.6%) of respondents said that they knew at least one type of long acting contraceptives methods while the rest 141(33.4%) did not know any of these long acting methods. From the two types of long acting modern contraceptives, implants were widely known by 139 (49.5%) of respondents. Regarding practice of long acting modern contraceptives, only 142(33.6%) ever used any type of these methods in their life time and implants were the most commonly used method.

Table 3: Knowledge of modern contraceptives among married women aged 15–49, in Akasta town, March to May, 2016

Variables	Possible responses	Number	Percent
Know at least one modern contraceptives (n=422)	Yes	365	86.5
	No	57	13.5
Type/s of modern contraceptives known by respondents (n=365)	Pills	139	38.1
	Injectables	116	31.8
	More than one type	110	30.1
Source of information (n=365)	Neighbors/friends	42	11.5
	Health institution	156	42.7
	Mass media	58	15.9
	School	27	7.4
	More than one source	82	22.5
Ever used modern contraceptives (n=422)	Yes	336	79.6

	No	86	20.4
Types of modern contraceptives ever used/using now (n=336)	Pills	139	41.4
	Injectables	197	58.6
Know long acting modern contraceptives (n=422)	Yes	281	66.6
	No	141	33.4
Types of long acting modern contraceptives known (n=281)	Implants	139	49.5
	IUCD	56	19.9
	Both	86	30.6
Ever used long acting modern contraceptives (n=422)	Yes	142	33.6
	No	280	66.4
Types of long acting modern contraceptives used by respondents (n=142)	Implants	114	80.3
	IUCD	28	19.7
Duration of long acting modern contraceptives use (n=142)	Less than one year	56	39.4
	1-3 years	46	32.4
	More than 3 years	40	28.2
Shifted from long acting modern contraceptives to short acting's (n=142)	Yes	111	78.2
	No	31	21.8
Did your provider try to force you to choose long acting modern contraceptives method (n=422)?	Yes	28	6.6
	No	394	93.4

Table 4: Knowledge of modern contraceptives among married women aged 15–49, in Akasta town, March to May, 2016

Reasons for not using long acting modern contraceptives (n=280)	Not my first choice	97	34.6
	Have severe side effects	52	18.6
	Lack of adequate information about LARCs	131	46.8
Reasons to shift (n=111)	Method is inconvenient	28	25.2

	Due to fear of side effect	55	49.6
	Partner influenced me	28	25.2
Who chooses the method you are using (n=422)?	By my self	194	46.0
	The provider	28	6.6
	My husband	169	40.0
	My family	31	7.4
Reasons for using any modern family planning methods (n=336)?	For spacing	85	25.3
	For limiting no of children	114	33.9
	Prevent unwanted pregnancy	137	40.8

3.4 Factors associated with use of long acting reversible contraceptives

All independent variables were regressed to examine whether they have association with the use of long acting reversible contraceptives or not.

Multivariable logistic regression analyses showed that Age, husband's educational status, age at first sex, giving birth, number of children wish to have, history of unwanted pregnancy, history of abortion, occupation, knowledge of long acting modern contraceptives and attitude towards these methods were significantly associated with use of long acting reversible contraceptives.

Table.5 Bi-variable and Multivariable logistic regression analyses of selected factors affecting use of long acting modern contraceptives among married women, Akasta town, April 2016.

Variable	Categories	Number	COR(95% CI)	AOR(95% CI)
Age	15-19	87(20.6%)	2.348(1.386, 3.979)	2.9(2.25, 3.37)***
	20-34	225(53.3%)	1.732(0.415, 1.912)	1.26(1.07, 2.43)*
	35-49	110(26.1%)	1.00(ref.)	1.00
Religion	Muslim	265(62.8%)	6.312(2.149, 18.542)	2.42(0.344, 7.29)
	Orthodox	140(33.2%)	3.495(1.167, 10.461)	0.186(0.14, 2.55)
	Others(protestant, catholic)	17(4.0%)	1.00(ref)	1.00
Women Educational status	Unable to read & write	141(33.4%)	1.00(ref)	1.00
	Primary school	113(26.8%)	1.6 (0.63, 2.43)	1.52(0.3, 2.13)
	Secondary and above	168(39.8%)	2.16 (1.05, 3.44)	2.11(2.02, 3.27)***

Husband Educational status	Unable to read & write	54(12.8%)	1.0(ref)	1.00
	Primary school	172(40.8%)	1.24 (0.6, 2.51)	1.26(.77, 2.64)
	Secondary and above	196(46.4%)	3.31 (1.070, 5.75)	2.9(1.52, 6.42)**
Age at first sex(n=422)	>=18	224(53.1%)	1.0(ref)	1.00
	<18	198(46.9%)	2.79 (1.531, 4.192)	2.8(1.59, 4.30)***
Give birth(n=422)	Yes	337(79.9%)	8.033(4.708, 13.706)	7.58(4.32, 12.78)**
	No	85(20.1%)	1.0(ref)	1.00
No. of children wish to have in the future	No need	57(13.5%)	4.021(1.86, 7.54)	3.89(1.98, 7.43)**
	1-2	109(25.8%)	2.4(0.89, 3.99)	2.23(0.79, 3.85)*
	3-4	170(40.3%)	1.54(0.57, 3.54)	1.42(0.53, 3.52)
	5 or more	86(20.4%)	1.00(ref)	1.00
History of unwanted px(n=338)	Yes	227(53.8%)	2.635(1.738, 3.993)	2.5(1.59, 3.88)***
	No	195(46.2%)	1.00(ref)	1.00
History of abortion (n=156)?	Yes	113(26.8%)	3.057(1.669,4.671)	2.87(1.544, 4.62)***
	No	309(73.2%)	1.00(ref)	1.00
Current occupation	House wife	196(46.5%)	1.00(ref)	1.00
	Merchant	85(20.1%)	2.122 (1.069, 4.218)	1.9(0.993, 3.88)*
	Government employee	83(19.7%)	2.147 (1.078, 4.278)	2.1(0.854, 4.23)**
	Student	58(13.7%)	4.332 (1.669, 6.652)	3.7(1.53, 6.45)***
Knowledge of long acting modern contraceptives	Yes	281(66.6%)	7.70(3.992, 10.202)	6.39(2.76, 9.98)***
	No	141(33.4%)	1.0(ref)	1.00
Attitude towards long acting modern contraceptives	Positive attitude	217.125(51.5 %)	4.299(1.201, 4.404)	4.936(1.67,7.84)***
	Negative attitude	137.5(32.6%)	1.0(ref)	1.00
	Neutral	67.375(15.9 %)	1.215 (0.776, 1.901)	1.3(0.69, 1.81)

178 NB: *Significant at P < 0.05, **significant at P < 0.01, ***significant at P < 0.001.

Discussion

The prevalence of use of long acting contraceptives in the study area was found to be 33.6% and implants were the most commonly used methods. One hundred thirty one (46.8%) of respondents did not use these methods because of inadequate information provided for them.

Age, husband's educational status, knowledge of long acting reversible contraceptives and attitude towards these methods were significantly associated with use of these contraceptives.

Two hundred eighty one (66.6%) of respondents said that they knew at least one type of LARC methods while the rest 141(33.4%) did not know any of these methods. This finding is by far higher than the result from mini EDHS report of 2014 which showed that only 2 percent of currently married women have heard of this method and lower than the study conducted in Debre Markos, North west Ethiopia which showed that 91.4% of respondents were aware of at least one type of LARCs. The difference in these findings may be due difference in study time frame. Because of the current spread of awareness creation programs through mass media.

In this study implants were the most known LARC method which is in line with the study conducted in Debre Markos, North west Ethiopia. This study was also similar with the study done by Alemayehu Shimeka and Abebach Asmamaw. But the magnitude of respondents who know implants was less in this study. This may be because of less exposure of respondents to mass media as the study area is rural comparatively.

The study showed that from the total 422 respondents only 142(33.6%) ever used any type of these methods in their life time and implants were the most commonly used methods. This study is higher than the study done in Ethiopia by Alemayehu Shimeka and Abebech Asmamaw which showed that prevalence of LARCs was 59(19.5%). This may be because of the time difference when the two studies were conducted. In other ways the finding of this study is less than the study conducted in Debre Markos, north west Ethiopia and Adigrat town, Northern Ethiopia, which is 48% &48.4% respectively and the possible justification may be because of the socio-cultural difference of the respondents which influence their awareness of LARCs.

Age was found to be significantly associated with use of LARCs, high use at early age and decreases gradually. In this study women in the age group of 15-19 years were 2.9 times more likely to use long acting contraceptives when compared to those in the age group of 35-49 years [AOR at 95% CI= 2.9(2.25, 3.37). Those in the age group of 20-34 years were less likely to use LARCs when compared to those in the age group of 15-19 years. This finding is similar with the study done in Debre Markos which indicated that Women's at age 30 - 34 years were less likely to use long acting reversible contraceptive methods as compared to women with age group of 20-24 [AOR (95%CI) = 0.345(0.143, 0.833)]. Another study in china also revealed that use of IUCD decreased with increasing age. The possible explanation for decreasing LARCs use with increased age may be because women want to give birth in the age range of 20-35 years.

Educational status was other important predictors of LARCs use. Respondents who have completed secondary education and above were 2 times more likely to use LARCs [AOR at 95% CI= 2.11(2.02, 3.27)]. Educational status of husbands was also significantly affects use of LARCs by their wives. Women whose husbands completed secondary education and above were 2.9 times more likely to use LARCs when compared to those whose husbands were unable to read and write [AOR at 95% CI=2.9(1.52, 6.42)]. This finding is similar with the study done among Reproductive Age Women in Ethiopia which showed that women who had secondary and above level of education were 3 times [AOR (95%CI) = 3 (1.5, 5.0)] more likely to use LACRs than non-educated women. The possible reason may be education increase women's level of understanding about benefits of LARCs and can get information from printed materials.

Sex initiation before the age of 18 years was significantly associated with LARCs use [AOR=2.8, (1.59, 4.3)]. Women who gave birth were more likely to use LARCs than those who didn't gave birth [AOR=7.5(4.32, 12.78)]. Women who did not wish to have any more children were more likely to use LARCs than who wish to have 5 or more children. This finding is similar with the study done in Adigrat, Northern Ethiopia which concluded that Women who did not desire additional children within the next two years were more likely to intend to use LARCs. Another study in Ethiopia also revealed that Women who have more than four children were 5.8 times [AOR (95%CI) =5.8 (2.7, 12.0)] more likely to use LARCs compared to women who have no children. Moreover, women who have no desire for next children were 2.5 times [AOR

(95%CI) = 2.5 (2.0, 3.4)] more likely to use LARCs than women who want another children. This may be because women who gave birth of four or more children has reached their limit of family size and preferred to use most effective long acting reversible methods.

Having history of unwanted pregnancy and induced abortion were positively associated with LARC s use [AOR at 95% CI=2.5(1.59, 3.88), AOR=2.87(1.544, 4.62)] respectively. This may be explained that women could deeply understand consequence of unwanted pregnancy and induced abortion so that they may preferably use LARCs not to repeat their previous fault.

Concerning occupation students, government employees and merchants were more likely to use LARCs than house wives [AOR at 95% CI=3.7(1.53, 6.45), 2.1(0.854, 4.23) and 1.9(0.993, 3.88)] respectively. Students, employees and merchants were 3.7, 2.1 and 1.9 times more likely to use LARCs than house wives respectively. The finding of this study was in line with the study done in Debre Markos which showed that Occupation of women was found to be significantly associated with long acting contraceptive use. It showed that students were 6.09 time more likely to use LARCM than House wife, 8.13 times more likely to use LARCM than Merchants, 3.09 times more likely to use LARCM than daily workers & 2.77 times more likely to use LARCM than employed workers. This could be justified that house wives had less exposure to many information sources and cannot easily understand the benefit of LARCs.

Those women having knowledge of long acting reversible contraceptives were by far more likely to use them [AOR at 95% CI=6.39(2.76, 9.98)]. Women who are knowledgeable were 6.4 times more likely to use LARCs. Similarly, study in Mekelle showed that mothers who had knowledge were more likely to use LARCs.

Having positive attitude towards LARCs was important predictor of LARCs use. Those women having Positive attitude towards LARCs was 4.9 times more likely to use LARCs than those having negative attitude [AOR at 95% CI=4.936(1.67, 7.84)]. This finding is similar with the study conducted in Ethiopia which showed that women who had a supportive attitude regarding LARC were 2 times more likely to accept LARC as compared with those who had non-supportive attitude (AOR=2. 094, 95% CI (1.109, 3.954)].

Conclusion

The study showed that the prevalence of long acting reversible contraceptives in the study area was low. From the total of 422 respondents, 281 (66.6%) of them said that they knew at least one type of long acting reversible contraceptive methods but only 142(33.6%) ever used any type of these methods in their life time and implants were the most commonly used methods.

Reasons for not using long acting modern contraceptives were also assessed. From two hundred eighty (280) respondents who never used these methods 131(46.8%) of them said that they did not use these methods because of inadequate information provided for them regarding advantages and effectiveness of this methods and 34.6% of them responded that it was not their first choice.

Multivariable logistic regression analyses showed that Age, women and their husband's educational status, age at first sex, giving birth, number of children wish to have, history of unwanted pregnancy, history of abortion, occupation, knowledge of LARCs and attitude towards these methods were significantly associated with use of long acting reversible contraceptives.

Recommendations

Depending on the findings obtained from this study the author recommends that

- Health workers in the study area should provide appropriate counseling about long acting reversible contraceptives for clients
- Mass media should play its role in advertising the advantages of long acting contraceptives
- Woreda health office should organize Community awareness program

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Abbreviations

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AOR----------Adjusted odd ratio

CI----------Confidence interval

COR----------Crude odd ratio

EDHS----------Ethiopian demographic health survey

IUCD----------Intrauterine contraceptive device

LAFP----------Long acting family planning

LARC----------Long acting reversible contraceptive

LARCM---------- Long acting reversible contraceptive methods

SD----------standard deviation

References

1. Population Reference Bureau, World Population Highlights: Key findings from PRB'S 2009, World Population Data Sheet, Sep. 2009. 64(3).Available: http://www.prb.org/pdf 09/64.3 highlights.pdf (accessed august 2015).
2. US Agency for International Development (USAID). Using Quantification to Support Introduction and Expansion of Long-Acting and Permanent Methods of Contraception. USA: USAID|Deliver Project, Engender Health/The RESPOND Project October 2010, 2005–2010.
3. World Bank: MDG: Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio. Development Report. 2003; 208-212.
4. Central Statistical Agency [Ethiopia]; Ethiopia Demographic and Health Survey (EDHS 2011). Central Statistical Agency Addis Ababa, Ethiopia & ICF International Calverton, Maryland, USA March 2012.
5. Winner B, Peipert JF, Zhao Q, et al. Effectiveness of long-acting reversible contraception. N Engl J Med 2012; 366: 1998-2007.
6. Takele, A., Degu, G., Yitayal,M(2012). Demand for long acting and permanent methods of contraceptives and factors for non-use among married women of Gobat own, Bale Zone, and Southeast Ethiopia. J. Reproductive Health, 2006, 9-26
7. EDHS (2011). Preliminary report, CSA and measure DHS ORC Macro, 2011.
8. Central Statistical Agency [Ethiopia]; Ethiopia Demographic and Health Survey (EMDHS August 2014).

9. Babalola. S, John. N, factors underlying the use of long acting and permanent family planning methods in Nigeria: The Respond Project, August 2012, Journal of Public Health. Vol. 2, No. 5, 2014, pp. 424-430.
10. Family Health International (2007). Ambaw Damtew Regional Program Manager Pathfinder International/ Ethiopia Mengistu A., Snake M.D., M.P.H.Deputy Country Representative .Pathfinder International/Ethiopia Developed and written by Jennifer Wilder Senior Technical Communications Advisor Pathfinder International. Health Sector Development Program IV, 2010-2014. Addis Ababa; p. 27.
11. Addis Adera Gebru1, Atsede Fantahun Areas(2014):Assessment of Factors Affecting Long acting of Family Planning Utilization in Adigrat Town, Tigray, North-East Ethiopia. Journal of Family Planning and Reproductive Health Care 2008; 34(4): 213-218.
12. Alemayehu Shimeka Teferra and Abebach Asmamaw Wondifraw: Determinants of Long Acting Contraceptive Use among Reproductive Age Women in Ethiopia. Addis Ababa; 2010. p. 27 (7).
13. Alem Gebremariam and Adamu Addissie(2012) :Intention to use long acting and permanent contraceptive methods and factors affecting it among married women in Adigrat town, Tigray, Northern Ethiopia. Journal Med. Sci, 2012 6(4): 181-186.
14. Family Planning-A Handbook for Providers, Implants Chapter. Contraception 2008; 77: 67-76.
15. Mengistu Asnake, Elizabeth G. Henry: Addressing unmet need for long-acting family planning in Ethiopia: Uptake of single-rod progestogen contraceptive implants (Implanon) and characteristics of users. Journal of contraception, April 27, 2011.
16. Family Health International; a forum for putting knowledge into practice, February 2008 Volume 2, Issue 1.
17. Shimels Wudie : Assessment of factors affecting the use of long-Acting reversible contraceptive methods among married women of reproductive age group in Debre Markos district, North West, Ethiopia. Ethiop J Health Dev 2008, 22(3):28–33.
18. Hailay Gebremichael *et al.*: Acceptance of Long Acting Contraceptive Methods and Associated Factors among Women in Mekelle City, Northern Ethiopia. Journal of Public Health. Vol. 2, No. 4, 2014, pp. 349-355. doi:10.11648/j.sjph.20140204.27.

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