

# Utilization of Long Acting Reversible Contraceptive Methods and Associated Factor among Women who came for Family Planning Service in Bahir Dar City Public Health Facility, North West, Ethiopia, Institutional Based Cross Sectional Study

Asteray Assmie Ayenew \*, Amlaku Mulat and Toyiba Hiyaru

Department of Midwifery, College of Medicine and Health Sciences, Bahir Dar University, Ethiopia

## ABSTRACT

**Introduction:** Long acting reversible contraceptive method provides uninterrupted protection to women for 3 to 12 years. By far the most effective and very safe methods, when removed, return to fertility is prompt. Utilization of family planning method is a human right, central to gender equality and women's empowerment which is a key factor for reducing poverty, for the health of child and women and for the development of the country, but utilization is still slanted to short acting methods.

**Objective:** The aim of this study was to determine Utilization of Long-Acting Reversible Contraceptive methods and associated Factors among women who came for family planning Service in Bahir Dar City public health facility, North West, Ethiopia, 2018.

**Methods:** Institutional based cross-sectional study was conducted from public health facility in Bahir Dar City from April 1 to 30<sup>th</sup> April, 2018. Systematic sampling technique was used to select study participants and allocated to each public health institution proportionally. Data entry and analysis was made by using Epi info version 7 and SPSS versions 23 respectively. The association between the independent and outcome variables was first computed using bivariate analysis and p-value  $\leq 0.25$  was included into multivariable analysis. Finally, multivariable analyses were carried out with p-value  $\leq 0.05$ .

**Result:** The overall utilization of long acting reversible contraception was 18.4%. Having good knowledge (AOR=3.95% CI:1.52-5.9), desired number of children (AOR=2.4:95% CI:1.22-4.8) and having favourable attitude (AOR=4.9:95% CI:2.26-10.6) were predictors of long acting reversible family planning method utilization.

**Conclusion:** In this study utilization of long acting reversible contraception is found to be low. Desired number of children, knowledge and attitude were found to be the predictors of utilization of long acting reversible contraceptive methods. To scale up the utilization health education, adequate counselling, and mass education should be considered to increase level of awareness, changing the attitude of the reproductive age women and to minimize myth and misconception to enhance the uptake.

**Keywords:** Long acting reversible contraceptives; Utilizations; Associated factors; Reproductive age women; Bahir Dar City; Ethiopia

**Abbreviations:** Adjusted Odds Ratio (AOR); Communicable Disease Control (CDC); Confidence Interval (CI); Ethiopian Demographic and Health Survey (EDHS); Federal Ministry of Health (FMOH); Intra Uterine Contraceptive Device (IUCD); Long Acting Reversible Family Planning Methods (LARFPM); Millennium Development Goals (MDGs); Oral Contraceptive Pills (OCP); Odds Ratio (OR); World Health Organization (WHO)

## INTRODUCTION

Family planning is defined as the way of controlling birth and allows

people to attain their desired number of children and determine the spacing of pregnancies or the voluntary planning and action taken by individuals to prevent, delay or achieve a pregnancy.

**Correspondence to:** Asteray Assmie Ayenew, Department of Midwifery, College of Medicine and Health Science, Bahir Dar University, Ethiopia, Tel: + 251 945560077; E-mail: mambusta2@gmail.com

**Received:** December 06, 2018, **Accepted:** May 30, 2019, **Published:** June 06, 2019

**Citation:** Ayenew AA, Mulat A, Hiyaru T (2019) Associated Factor among Women who came for Family Planning Service in Bahir Dar City Public Health Facility, North West, Ethiopia, Institutional Based Cross Sectional Study. J Women's Health Care 8:466. doi: 10.35248/2167-0420.19.8.466.

**Copyright:** © 2019 Ayenew AA, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Access to family planning through preferred and effective methods contributes to health of mothers, supports the health and development of community as well as access to informed choice, safe, voluntary family planning method is a human right [1].

Modern contraceptives methods are divided into three: Long acting reversible contraceptive methods (IUCD & Implants); permanent contraceptive methods (tubal ligation & vasectomy) and short term contraceptives methods (Oral pill, inject-able, male & female condoms, foam tablet & cervical cap because of their long lasting protection and reversibility, long acting reversible contraceptives can be used for a couple of years [2].

Long-acting reversible contraception is methods of birth control that provide over 99% effective for an extended period without requiring user action which includes Intra-Uterine Device (IUCD) and the implants They prevent unwanted pregnancy at least for 3 years for implants and 12 years for copper T- IUCD, when removed, the return of fertility is prompt [3].

One of the Millennium Development Goals (MDGs) which most countries of the developing fourth world strive to achieve by 2015 is MDG 5 that targeted reduction of maternal mortality by three-fourth between 1990 and 2015. According to world health organization report 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 MMR which is 412 maternal deaths per 100,000 live births [4,5].

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 modern family planning methods and every birth is safe. ACOG guidelines revised in 2012 of advice that adolescents who are sexually active and at high risk of unintended pregnancy should be encouraged to consider LARCs as a contraceptive option and WHO also supports the use of LARCs for women of all ages [6,7].

Effective contraceptive like modern LARC method could prevent as many as one in every three maternal deaths by allowing women to space births, avoid unintended pregnancies, abortions and to stop childbearing when they have achieved their preferred family size [8]. In real-world tests LARC methods were over 20 times more effective at preventing unintended pregnancy compared to the contraceptive pill, patch or ring. Although LARC use and continuation has been proven to effectively reduce unintended pregnancy thereby reducing abortion, not more than 15% of women use LARC method worldwide [9].

In spite of their effectiveness, LARC are under-utilized by women. facilitating uptake by ensuring that a range of contraceptive providers are trained and able to provide to women without undue delay may also be effective strategies to improve uptake and prevent more unintended pregnancies [10].

Rapid repeat pregnancy (RRP) is associated with increased maternal and neonatal morbidity and continues a cycle of economic deprivation for young women and their families. Adolescents who do not initiate a LARC method have up to a 35 times increased risk of RRP compared with their peers using LARC [11]. A decrease in unmet need for family planning accompanied this rapid increase

in the use of contraceptives, such that 12 per cent of married or in-union women globally had an unmet need for family planning in 2015. However, wide disparities in the level of unmet need for family planning are still evident among countries, and a benchmark set by Governments in 1999 to close the gap in meeting demand for family planning by 2015 is out of reach for most countries [12].

Despite its numerous advantages, only 18.9% of LARC was utilized globally and unmet need for contraception was over 12.3% and total contraceptive prevalence was 63.2%, two hundred eight million births occur in the world annually of this total 41% is estimated to be unintended. Regarding Sub-Saharan Africa, any contraception method prevalence is 25.1%, any modern family planning method is 19.7%, nevertheless, LARC utilization is 1.8% and quite the opposite unmet need of this region is 25.3% [13].

Total fertility rate of Ethiopia was 4.6 children per women, population growth rate was estimated to be 2.7% per year and modern contraceptive prevalence rate was only 29% with LARC utilization of 6.1% , at which fertility declined from 4.8 to, 4.6 children per woman between 2011-2016 which had decrease by about one child and the decrement also very slow and time taking, the Federal Ministry of Health (FMOH) has considered the important role of long-acting reversible contraceptive methods and aim to provide all family planning clients with the long-acting and permanent methods [14,15].

## METHODS

### Study design and setting

An institution based cross-sectional study was conducted from April 1<sup>st</sup> to April 30<sup>th</sup> 2018 in Bahir Dar City public health facility, northwest Ethiopia. The city is 578 km North West of Addis Ababa at an elevation of 1,800 meters above the sea level and situated on the southern shore of Lake Tana, Ethiopia's largest lake. Bahir Dar city especial zone had a total population of 221,991, of whom 108,456 were male and 113,535 were female [14] and had two public hospitals (Felege Hiwot referral Hospital and Abay Mado Hospital), two private hospitals (Gamby Teaching Hospital and Adinas General Hospital), six health centers (Abay Mado, Shimbit, BDR, Han, Ginbot 20 health center) and two NGO (marry stop and Family Guidance Association).

### Sample size and sampling procedure

Sample size for the first objective was determined by using a formula for estimating single population proportion by using Epi info version 7 statcalc, taking the assumptions of 95% confidence interval, margin of error (d) (0.05), proportion of women who use LARC P=(25.2%) from a study done in Mizan Aman [15] and Sample size for the second objective was determined by using a Formula for estimating double population proportion formula by using Epi info version 7 statcalc, taking the assumptions of 95% confidence interval, margin of error (d) (0.05), those who shift methods (33.9%) from previous study and by comparing the two samples, the largest sample size was taken and by adding 10% non-response rate the total sample size was 359. Both public and private health facilities are providing family planning services in the city. For this study only government health facilities were considered, i.e. two hospitals and six health center of these government

health facilities were included in the study. The calculated sample size was proportionally allocated to each health facility based on the previous consecutive one-month average daily client flow of the units which was obtained by referring client registration log books. The average monthly client flow of women in all selected health facilities was found to be 1988 in a month. All reproductive age women attending family planning services was allocated proportionally to each public health facility based on the average client flow and each participant were selected by using systematic random sampling method. All women of reproductive age group (15-49 years) who were taking family planning at selected health institutions were included in the study. Women who come again during data collection period were excluded (Figure 1).

**Data collection tools and procedure**

The data was collected from April 1<sup>st</sup> to April 30<sup>th</sup> 2018 by eight midwives and 2 supervisors by using face to face interview, a structured questionnaire adopted from different literatures. The dependent variable of the study was utilization of long acting reversible contraceptive method and independent variable were socio-demographic variables (age, religion, ethnicity, residence, educational status, husband educational status, income, woman occupation, husband occupation), obstetric factors (parity, age at first marriage, age at first birth, history of abortion, , number of children woman wish to have), awareness variables (discussed contraceptive, heard about long term reversible contraceptives) which were included on the questionnaires.

Before the actual data collection, the tool was translated to local language (Amharic) and pre-tested on 5% [16] participants in Enjibara hospital which is 45 km north from Bahir Dar to check for clarity of the items and also to identify any confusing or vague items in the questioner. Based on the pre-test, the time needed for the complete interview and the number of data collectors in need was estimated. The principal investigator trained eight diploma midwives as data collectors and two BSc midwives as supervisors for two consecutive days on objective, data collection tools and interview techniques including privacy and confidentiality of

participants. The interview was conducted in a place where the woman feels free to express their feeling and ideas. Supervisors made spot checking and reviewing the completed questionnaires on daily bases to ensure completeness and consistency of the information which was collected.

**Measurement**

Knowledge of all reproductive age women was measured by the total number of correct answers to 8 items on knowledge with a minimum score of 0 and maximum of 8. To measure the knowledge, it was categorized based on the percentage of knowledge of the distinct characteristics of LARC as: "good" those who knew above the mean and "poor" those who knew mean and below from knowledge measuring questions. Items on attitude of reproductive age women was measured by asking attitude measuring questions about the use of LARC were grouped in to three categories as "agree", "disagree" and "not sure". For analysis purpose to measure the attitude of the all reproductive age women, two categories were assigned: "Favourable Attitude"- those who scored above the mean to the correct answers from attitude measuring items and "Unfavourable Attitude" - those who scored the mean or below to attitude measuring items. Finally, reproductive age women's use or not use of long acting reversible contraceptive methods among study units was set as binary outcome variable.

**Data processing and analysis**

A checked data was entered into Epi info version 7 and exported to SPSS version 23 for analysis. Frequency distribution and cross tabulations were used to check for missed values during analysis. Any errors were corrected after the revision of the original data using the code numbers of the questionnaires. Bivariate logistic regression was done for each independent variable with outcome variables to estimate the crude odds. All variables with p value<0.25 were considered for the final multivariate model. Multivariable logistic regression method was used to assess the independent effect of different variables after simultaneously controlling for the effect of confounding factors. Finally, variables which show

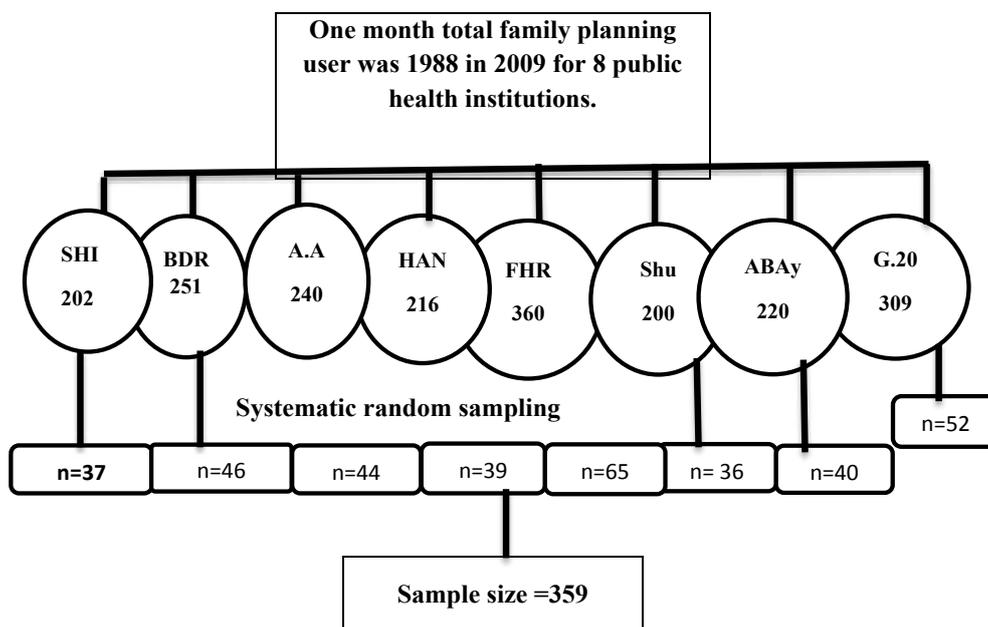


Figure 1: Schematic presentation of sampling procedure.

significant association in the multivariable analysis with a p value less than 0.05 were reported as Adjusted Odds Ratio (AOR) with 95% confidence interval. Descriptive statistics were summarized using frequencies and percentages. Tables and figure were used to give a condensed picture of the data.

## RESULTS

### Socio-demographic characteristics

A total of 359 reproductive aged women were included in analysis with response rate 100%. The mean age of the study participants were 26 years old with S.D  $\pm$  4.77years. Of the respondents of the study, majority were Amhara 337(93.9%) in ethnic group and regarding occupational status 178(49.6%), 82(22.8%), 39(10.9%) were housewives, governmental employ and merchant respectively, whereas regarding educational level 119(23.1%) women had no formal education, 45(12.5%) had primary education, 119(33.1%) secondary and 76(21.1%) completed college/university. Concerning husbands educational level 89(24.7%) had no formal education, 79(22%) completed college/university (Table 1).

### Reproductive performance of the study participants

From 359 study participant's majority of the respondents had given birth, 220(61.3%) as well more than 180(50.1%) of them gave birth after age twenty years. Majority of 327(91.1%) had no abortion history (Table 2).

### Information about long acting reversible contraceptives among study participants

Most women had information about long acting reversible contraceptives 331(92.2%) of those the most common source of information for the study participants was 12(45.1%) health professionals and of those study participants 224(65.2%), heard or aware about implant during study period (Table 3).

### Knowledge of women about long acting reversible contraceptives

Out of the study participants 230(64.1%) know IUCD can prevent pregnancy for 12 years and 228(63.5%) did not know IUCD do not interfere with sexual intercourse. Majority of the study participants 207(57.7%) had knowledge about the notion that implants can prevent pregnancy for 3-5 years but 152(42.3 %) of them did not know, 225(62.7%) of women had knowledge that after removal of the implant, return to fertility is prompt. Majority of them 184(51.3%) had poor knowledge and the remaining 175(48.7%) had good knowledge (Table 4).

### Attitude of the study participants towards LARC

Among the study participated women only 169(47.1%) agreed that insertion of IUCD does not lead to lose privacy and 186(51.8%) agreed that IUCD do not restrict from performing daily activity, 42.9% of women had favourable attitude and 57.1% of women had unfavourable attitude towards LARC (Table 5).

### Utilization of contraceptive methods among study participants

Among the study participant the utilization of long acting reversible

**Table 1:** Socio-demographic characteristics of reproductive age women in B/Dar city north-west Ethiopia, May 2018 (n=359).

Variables	Frequency	Percentage (%)
<b>Women's age in years</b>		
20-25	193	53.8
26-31	95	26.5
32-37	67	18.7
$\geq$ 37	4	1.1
<b>Marital status</b>		
Married	281	73.8
Divorced	15	4.2
Single	63	17.5
<b>Ethnicity</b>		
Amhara	337	93.3
Tigray	12	3.3
Oromo	6	1.7
Other****	4	1.1
<b>Religion</b>		
Orthodox	201	56
Muslim	120	33.4
Protestant	36	10
Other *	2	0.6
<b>Level of education</b>		
Can't read and write	50	13.9
Read and write	69	19.2
Elementary school	45	12.5
Secondary school	119	33.1
College/University	76	21.2
<b>Women's occupation</b>		
House wife	179	49.9
Government employee	71	26.5
Merchant	48	12.8
Daily labourer	13	9.5
Other (specify)***	5	1.4
<b>Husband's education (n=268)</b>		
Can't read and write	26	7.2
Read and write	53	14.8
Elementary school	50	13.9
Secondary school	81	22.6
College/University	58	16.2
<b>Husband occupation (n=268)</b>		
Government employee	87	24.2
Merchant	71	19.8
Daily labourer	48	13.4
Driver	45	12.5
NGO	13	3.6
Other**	4	1.1

\*Catholic, \*\*3 student, 1 farmer, \*\*\*3 student, 2 night club, \*\*\*\*Addis Ababa

contraceptive was 18.4% of those the majority used implant 16.2% and 2.2% used IUCD. From the participants 36.5% of women were shifted or switched from one contraceptive to other, of those the main reason to shift from one contraceptive method to another contraceptive method, (10%) were due to side effect followed by

**Table 2:** Reproductive performance of the study participants, Bahir Dar city north-west Ethiopia, 2018.

Reproductive History	Frequency	Percentage (%)
<b>Ever give birth</b>		
Yes	220	61.3
No	139	38.7
<b>Age at first birth</b>		
≤ 20years	40	22.2
>20years	180	87.8
<b>Live number of children</b>		
0-02	113	31.2
03-04	91	25.3
≥ 5	16	4.8
<b>Desired number of children</b>		
0-3	281	78.3
≥ 4	78	21.7
<b>Ever had abortion</b>		
Yes	32	8.9
No	327	91.1

**Table 3:** Source of information on LARC among study participants, B/DAR city north-west Ethiopia, May 2018.

Variable	Frequency	Percentage (%)
<b>Information about LARC</b>		
Yes	331	92.2
No	28	7.8
<b>Which LARC ever heard (n=331)</b>		
Implant	224	65.2
IUCD	60	17
Both	47	13.9
<b>Source of information</b>		
Neighbours/relatives	66	18.4
Husband	30	8.4
Mass media	64	17.8
Health professional	167	45.7
Others*	4	1.1

\*2 formal educations, 2 reading

(10%) were due to inconvenience of the previous method (Table 6).

### Factor associated with the utilization of long acting reversible contraceptives

In the study, age, women education, husband education, Information about LARC, knowledge, attitude, source of information, desired number of children were significantly associated with long acting reversible utilization in bivariate analysis. The final result in multivariate analysis of this study confirmed that knowledge, attitude and desired number of children were identified as significant determinants of utilization of long acting reversible contraceptive methods. In this study women's levels of knowledge on long acting reversible family planning methods found to be one of the determinants of utilization, those who had good knowledge three times (AOR=3.95% CI:1.52-5.9) more likely to utilize LARC than those who had poor knowledge. Comparing from women who had unfavourable attitude about long acting reversible family

**Table 4:** Knowledge of the study participants about LARC, B/DAR city north-west Ethiopia, May 2018 (n=359).

Knowledge measuring statement of reproductive age women on LARC	Yes		No	
	Frequency	Percentage	Frequency	Percentage
IUCD prevent pregnancy for 12 years.	230	64.1	129	35.9
IUCD appropriate for preventing STIs.	203	56.5	156	43.5
IUCD interfere with sexual intercourse.	228	63.5	131	36.5
IUCD cannot cause cancer	223	62.1	136	37.9
Implant prevents pregnancy for 3-5 years.	207	57.7	152	42.3
Implant cannot cause libido	182	50.7	177	49.3
Implants reverse pregnancy quickly when removed if the women need to be pregnant	225	62.7	134	37.3
<b>Knowledge score of the respondents</b>	<b>Frequency</b>	<b>Percentage</b>		
Poor	184	51.3		
Good	175	48.7		

planning usage and those women who had favourable attitude were 4.9 times more likely to utilize long acting reversible family planning methods (AOR=4.9;95% CI:2.26-10.6). The other predictor of LARC utilization is desired number of children, women wish to have in the future than those who wants 0-3 number of children were 2.4 times more likely to use LARC compared to those who want to have ≥ 4 children with (AOR=2.4;95% CI:1.22-4.8) were remained statistically significant with the utilization of long acting reversible contraceptives (Table 7).

## DISCUSSION

This study was mainly identified magnitude of LARC users and predictors determining utilization among women of reproductive age, which was 18.4% (14.5-22.6), the commonly used long acting reversible method were implant (16.2%) and 2.2% used IUCD, in Bahir Dar city public health facility. The result of this study is lower than the result reported from USA 49.3% [17], China (43%) [18], Areka (29.7%) [19], Addis Ababa (34.8%) [15], Harer [20], in line with study result in Debremarkos (19.5%) [21], Mizana Aman (18.2%) [16], Dendy (17.5%) [21], whereas high relative to previous studies conducted in Mekele town (12.3%) [22]. In USA (49.3%) institutional based study was done among health professionals, the differences might be due to the fact that USA is more developed than Ethiopia and participants were health professionals, so that awareness of the study participants, access to information and services the cultural and socio-demographic status of participants might be the core reason.

In China (43%) institutional based study was conducted, among reproductive age group, who came for abortion services, the utilization was high. The reason might be China is more developed than Ethiopia and participants might have better knowledge, better

**Table 5:** Attitude of the study participants towards LARC, B/DAR city North west Ethiopia, May 2018.

Attitude measuring question	Agree		Not Sure		Disagree	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Using implant does not restrict from performing daily activities	170	47.4	153	42.6	36	10
Insertion /removal of IUCD do not lead to lose privacy.	169	47.1	156	43.5	34	9.5
IUCD doesn't move through the body after insertion.	155	43.2	153	42.6	51	14.2
Using IUCD do not restrict from performing daily activities.	186	51.8	131	36.5	42	11.7
Insertion and removal of implant is not highly painful.	213	59.3	104	29	42	11.7
Implant doesn't move through the body after insertion.	151	42.1	91	25.3	117	32.6
<b>Attitude score towards</b>			<b>Frequency</b>		<b>Percentage</b>	
Favourable attitude			154		42.9	
Unfavourable attitude			205		57.1	

**Table 6:** Utilization of LARC among study participant's, B/DAR city north-west Ethiopia, May 2018 (n=359).

Variables	Frequency	Percentage
<b>Contraceptive currently used</b>		
Pills	97	27
Injectable	189	52.6
Implant	58	16.2
IUCD	8	2.2
Other	7	1.9
<b>LARC user</b>		
Yes	66	18.4
No	293	81.6
<b>Type LARC currently used</b>		
Implant	58	16.2
IUCD	8	2.2
<b>Reason for not to use</b>		
Medical reason	5	1.4
Provider counselling	20	5.6
Husband/relative influence	102	28.4
I don't want	40	34.8
Fear of side effect	125	11.2
<b>Ever shifted</b>		
Yes	131	36.5
No	228	63.5
<b>From which to which</b>		
Long to short	36	10
Long to long	5	1.4
Short to long	45	12.5
Short to short	45	12.5
<b>Reason to shift</b>		
For inconveniency of previous method	32	8.9
No access	2	0.3
Side effect	37	10.3
Provider counsel me	15	4.2
Need for long /short method	29	8.1

Partner influence me	10	2.8
Other*	7	1.9

\*4 Medical reasons, 3 divorces

attitude, and different socio-demographic status of participants. The other core reason might be the participants were women who came for abortion services, so that awareness of the study participants, access to information and services, intension to use LARC might higher.

In Areka (29.7%), community based cross-sectional study was conducted, among reproductive age married women and the difference might be all private and NGO institutions were included and also the study participants were all married women, as well as there may be age difference between participants.

In Addis Ababa (34.8%), community based cross-sectional study was conducted, among reproductive age women and the difference might be different socio-demographic status of participants and those participants have different source information about LARC.

The other reason might be private and NGO institutions were included, and more NGO and other health related sectors may contribute for utilization like giving training for health professionals, availability of LARC, sponsor for mass media, since Addis Ababa is a central city. In Harer facility based cross sectional study was conducted on utilization of long acting reversible contraceptive among mother of reproductive age which was 38%. The difference may be due to aggressive community mobilization and awareness creation on long acting reversible contraceptive. The other reason might be the comprehensive long acting reversible contraceptive training was given to most health care providers. The other reason might be and the government is working on accessibility of service.

This study was line with study conducted in Debre Markos (19.5%) [21], Mizana Aman (18.2%) [16], Dendy (17.5%) [21], respectively. In Debre Markos institutional based study was conducted on utilization and factors affecting the use of long-acting reversible contraceptive which was 19.5% which is in line with the result of this research. This might be due to the study participants might have nearly similar socio-cultural and demographic characters.

**Table 7:** Statistical association of predictor variables, with LARC utilization among reproductive age women, Bahir Dar city north-west Ethiopia 2018.

Variables	LARC utilization				
	Yes (%)	No (%)	COR 95%CI	AOR 95%CI	P value
<b>Age</b>					
20-25	38 (19.7)	155 (80.3)	1	1	-
26-31	18 (18.9)	77 (81.1)	4.079 (0.557-29.894)	1.3 (0.06-28.5)	0.86
32-37	8 (11.9)	59 (88.1)	4.278 (0.564-32.442)	1.6 (0.07-36)	0.76
≥ 37	2 (50)	2 (50)	7.375 (0.908-59.893)	2.8 (0.11-67)	0.52
<b>Level of education</b>					
Can't read and write	15 (30)	35 (70)	1	1	1
Read and write	10 (14.7)	59 (11.9)	2.529 (1.025-9.237)	0.87 (0.3-2.47)	0.801
Elementary school	9 (20)	36 (85.5)	1.714 (0.664-4.425)	1.98 (0.67-5.8)	0.21
Secondary school	16 (13.4)	103 (80)	2.759 (1.237-6.153)	1.59 (0.5-4.8)	0.425
College/University	16 (21.1)	60 (78.9)	1.607 (0.709-3.653)	1.8 (0.7-4.5)	0.24
<b>Husband education</b>					
Can't read & write	7 (26.9)	19 (73.1)	1	1	1
Read and write	11 (17.5)	52 (82.5)	1.742 (0.589-5.147)	0.8 (0.18-3.5)	0.77
Elementary school	13 (19.1)	55 (80.9)	1.559 (0.542-4.484)	0.9 (0.3-2.8)	0.98
Secondary school	23 (18.7)	100 (81.3)	1.602 (0.602-4.259)	0.9 (0.2-2)	0.5
University/college	12 (15.2)	67 (84.8)	2.057 (0.711-5.951)	0.6 (0.36-2.4)	0.89
<b>Desired number of children</b>					
0-3	238 (84.7)	43 (15.3)	2.3 (1.28-4.2)	2 (1.22-4.8)	0.011
≥ 4	55 (70.5)	23 (29.5)	1	1	-
<b>Ever heard about LARC</b>					
Yes	54 (16.3)	277 (83.7)	1	1	-
No	12 (42.9)	16 (57.1)	3.847 (1.723-8.590)	1.87 (0.105-27.217)	0.712
<b>Source of information</b>					
Neighbours /relatives	14 (21.2)	52 (78.2)	1	1	1
Husband	5 (16.7)	25 (83.3)	1.8 (0.436-8.355)	1.97 (0.35-11)	0.44
Mass media	12 (18.8)	25 (81.3)	2.5 (0.46-1.5)	2.3 (0.3-15.3)	0.38
Health professional	23 (14.2)	139 (85.8)	2.1 (0.477-9.9)	2.71 (0.4-7.15)	0.26
Others	3 (33.3)	6 (66.6)	3 (0.7-12.429)	2.8 (0.60-33)	0.15
<b>Knowledge</b>					
Poor	46 (25)	138 (75)	1	1	-
Good	20 (11.4)	155 (88.6)	2.58 (1.45-4.58)	3 (1.52-5.9)	0.001
<b>Attitude</b>					
Favourable	57 (27.8)	145 (94.2)	6.4 (2.96-12.99)	4.9 (2.2-10.6)	0
Un favourable	9 (5.8)	148 (72.2)	1	-	-

They might have comparable level of awareness, or it might be similar study design was done. Institution based cross sectional study was conducted in health centres on determinants of long acting reversible contraceptives among child bearing age women in Dendi District, and found to be 17.5% in line with the result of this research. This might be due to the fact that the study was done only among public health facility or the study participants might have nearly similar awareness and attitude towards LARC.

In Mizan Aman the study was done on utilization of long acting reversible contraceptive methods and its associated factors among women of reproductive age groups which was 18.2%, in line with this study. This might be due to fact that most participants were at the age of 25-30 years or comparable level of awareness and attitude towards LARC. The prevalence of LARC utilization was high relative to previous studies conducted in Mekele town (12.3%) [22]. In Mekele a cross sectional community based survey

was conducted with LARC utilization of 12.3%, this result is lower than the result of this research the reason might be differences in the study area, access to information and the services, cultural and socio-demographic status of participants, knowledge attitude difference and female empowerment might be the core reason.

Knowledge was a significant predictor for utilization of long acting reversible methods, accordingly women who had good about LARC were 3 times more likely to utilize LARC as compared to those who had poor knowledge. This finding was in consistent with the study done in Mekelle town [23]. The reasons might be having good knowledge might be attributed to better understanding of family planning messages in general and LARC in particular. The other reason might be women who are more knowledgeable, also better equipped with discussion to health professionals, manage side effects and more likely to fairly weigh the risks and benefits of using contraception and giving sound decision. The other significant

predictor of long acting utilization was attitude, participants who had favourable attitude were 4.9 times more likely to utilize long acting reversible family planning methods (AOR=4.9;95% CI:2.26-10.6).

In this result is with evidence from Ethiopian demography and health survey report (EDHS, 2016), the odds of long acting contraceptive utilization increased for mothers who had favourable attitude towards long acting reversible contraception. This might be mothers who had favourable attitudes towards long acting reversible may not simply accept myths and misconception. The other reason might be those who had positive attitude might accept providers counselling and might also have good knowledge. The other predictor of LARC utilization is desired number of children women wish to have in the future than those who wants 0-3 ideal number of children were 2.4 times more likely to use LARC compared to those who want to have  $\geq 4$  children with (AOR=2.4;95% CI:1.22-4.8).

This study exposes the desired number of children to be a predictor of LARC utilization. A woman who wants to have more children has lower odds of LARC use. This is in line with the study done in Arbaminich [16]. This might be due to those participants who need more children may prefer short term methods, due to need of pregnancy in short period. On the other hand, it might be due to they may have fear of fertility return after the use of long acting reversible contraceptive methods.

## CONCLUSION

The study revealed that utilization of long acting reversible family planning among reproductive age women in Bahir Dar city, public health facility is low as compared to the national plan. Majority of the study participants had poor knowledge on long acting reversible contraceptive methods. More than half of a women had unfavourable attitude towards long acting reversible contraceptive methods. Knowledge, attitude level and desired number children were identified as significant predictor of utilization of long acting reversible family planning methods.

## RECOMMENDATION

After reviewing the findings of the study, the following recommendations were made:

### Health institution and health professionals

- It is imperative to ensure availability of printed materials like leaflets that help family planning users to understand the benefits of LARCM use more.
- Emphasis has to be given to IEC to increase knowledge, attitude towards LARC during provision of any family planning methods.
- Any health institution must prepare mass education centres about LARC as part of regular activities.

### Researchers

- Need to conduct further studies on assessing the quality of service given and factors affecting the utilization of the long acting reversible family planning methods including the husbands.

- Incorporate quantitative with qualitative research.

## NOTES

### Acknowledgments

We are very grateful to the Bahir Dar University, College of Medicine and Health Science for financial support of this study. Then, we would like to thank all respondents who participated in this study for their commitment in responding to our questionnaire.

### Availability of data and materials

The dataset supporting the conclusion of this study are available within the manuscript.

### Authors' contributions

Asteray Assmie Ayenew designed the study, performed the statistical analysis and drafted the manuscript. Amlaku Mulat and Toyiba Hiyaru participated in the study design, implementation of the study and contributed to draft the manuscript. All authors contributed to the data analysis, read and approved the final manuscript.

### Competing interests

The authors declare that they have no competing interests.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Before the actual data collection letter of clearance were obtained from ethical clearance committee of Bahir Dar University, college of medicine and health science and Letter of permission were obtained from Amhara National Regional Bureau and Official letter were submitted to public health facility which were included in the study. Before proceeding to the formal data collection written formal consent were obtained and the right of the respondents to refuse to answer for any or all questions were respected.

## REFERENCES

1. WHO: Maternal mortality in 2000. 2013.
2. Darney PD. Family planning and the future. *Am J Obstet Gynecol.* 2011;205:S26-S28.
3. Factors influencing the selection of the copper intrauterine device as a method of emergency contraception 2010.
4. WHO: Trends in maternal mortality: 1990 to 2015 Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. 2015.
5. EDHS: Trends in Maternal Health in Ethiopia. 2012.
6. Jacobstein J. Long Acting and Permanent Contraception: An International Development, Service Delivery Perspective. *J Midwifery Womens Health.* 2007;52:361-367.
7. USAID: Long-Acting and Permanent Methods of Contraception: Meeting Clients' Needs. 2015.
8. Federal Democratic Republic of Ethiopia, Ministry of Health. National guideline for family planning services in Ethiopia. 2011.
9. Secura G. Long-acting reversible contraceptive: a practical solution to reduce unintended pregnancy. *Minerva Ginecol.* 2013;65:271-277.

10. Holton S, Rowe H, Kirkman M, Jordan L, McNamee K, Bayly C, et al. Long-acting reversible contraceptive: findings from the Understanding Fertility Management in Contemporary Australia survey. *Eur J Contracept Reprod Heal Care*. 2015;21:116-131.
11. Baldwin MK, Edelman AB. The Effect of Long-Acting Reversible Contraception on Rapid Repeat Pregnancy in adolescents: a review. *J Adolesc Health*. 2013;52:S47-S53.
12. United Nations. Trends in Contraceptive Use Worldwide. 2015.
13. Francis L, Rhoda KW, Joseph KBM, Christopher GO. Food Security and Nutritional Status of Children Residing in Sugarcane Growing Communities of East-Central Uganda: A Cross-sectional Study. *Journal of Food Security*. 2015;3:34-39.
14. Bureau: The World's Youth 2013 Data Sheet. WHO. 2013.
15. Ghana Statistical Service (GSS), GHSG and ICF Macro Mampong Municipal Health Directorate (MMHD) 2013.
16. Family Health International. Addressing Unmet Need for Family Planning in Africa: The Case for Long-Acting and Permanent Methods. 2007.
17. Use of Highly Effective Contraceptives in the US Continues to Rise, with Likely Implications for Declines in Unintended Pregnancy and Abortion. Guttmacher Institute. 2014.
18. CDC: Contraceptive methods available to patients of office-based physicians and title X clinics-United States, 2009-2010. *MMWR*. 2011;60:1-4.
19. UNFPA. Global Fact Sheet Report. Guttmacher Institute. 2014.
20. Alemayehu M, Belachew T, Tilahun T. Factors associated with utilization of long acting and permanent contraceptive methods among married women of reproductive age in Mekelle town, Tigray region, north Ethiopia. *BMC Pregnancy and Childbirth*. 2012;26:6.
21. Gebremichael H, Haile F, Dessie A, Birhane A, Alemayehu M, Yebyo H. Acceptance of long acting contraceptive methods and associated factors among women in Mekelle city, Northern Ethiopia. *J Public Health*. 2014;2:349-355.
22. Siraha P. The reasons for low utilization of long acting contraceptives amongst HIV positive women at harare post-test support services clinic, Zimbabwe. 2013.
23. Tran NT, E Yameogo WM, Gaffield ME, Langwana F, Kiarie J, Mashinda Kulimba D, et al. Postpartum family-planning barriers and catalysts in Burkina Faso and the Democratic Republic of Congo: a multiperspective study. *Open Access Journal of Contraception*. 2018;9:63-74.