

Determinants Of Long-Acting Reversible Contraceptive Methods Utilization Among Married Women Of Reproductive Age Group In Ambo Town, Oromia Region, West Ethiopia, 2016: A Case Control Study

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Abstract

Background Long-acting reversible contraceptive methods are highly effective, safe, convenient and cost-effective. The prevalence of long-acting reversible contraceptive methods utilization among married women in the study area was only 10%, which is comparatively low compared to the regional and national targets. **Objective** To identify determinants of long-acting reversible contraceptive methods utilization among married women of the reproductive age group in Ambo town, 2016 **Methods** Community based unmatched case-control study was conducted in Ambo town among married women of reproductive age group. 140 cases and 280 controls were randomly included. Bivariable and multivariable logistic regression was used to identify candidate variables and independent predictor variables respectively. Adjusted odds ratios together with their corresponding 95% CI were calculated to assess the strength of association and statistical significance. **Result** 139 cases and 279 controls were interviewed giving a response rate of 99%. Moderate level of knowledge on long-acting reversible contraceptive methods (AOR= 8.73, 95%CI: 3.08 - 24.77), Good level of knowledge (AOR=13.99, 95%CI:4.93-39.71), spousal discussion on long-acting reversible contraceptive methods (AOR=2.88, 95%CI:1.3-6.36), attitude toward long-acting reversible contraceptive methods (AOR=7.07, 95% CI: 3.77-13.24), intention to give birth in the future (AOR=0.085, 95%CI: 0.36-0.20), Women from households in the poorest wealth quintile (AOR= 6.83, 95%CI: 2.68-17.38), Women from households in the medium wealth quintile (AOR=5.83, 95%CI: (2.23- 15.23) and woman's expectation of restriction to methods use (AOR=0.34, 95%CI:0.22-0.53) were significant determinants of long-acting reversible contraceptive methods utilization. **Conclusion & Recommendation** Good knowledge, moderate knowledge, good attitude, wealth index, spousal discussion, intention to give birth in the future and woman's expectation of restriction to method use were determinants of long-acting reversible contraceptive methods utilization.

Background

Long-acting reversible contraceptive methods are highly effective to prevent pregnancy, convenient for users, cost-effective for programs over time, can result in substantial cost savings for governments and also contribute directly to reach at national and international health goals compared to short-acting methods. Two of these methods are Implants and Intrauterine device (IUD) which are long-acting methods and they are effective for up to 3 to 7 years and 10 to 12 years respectively. They help individuals and couples to get benefits that other methods of family planning couldn't and their provision helps these women who want to space or limit their pregnancies by having more choices on family planning methods. The use of long-acting reversible contraceptive methods can also enhance improvements in the health and well-being of entire families in various special ways. Once either device is removed, women's fertility returns almost immediately (1).

Long-acting reversible contraceptive methods are the most effective (>99%) methods of contraceptives available and they are very safe and convenient contraceptive methods. During one year of typical use, LARC methods are 3 to 60 times more effective than most

short-acting contraceptive methods. The long term nature of these forms of contraception does not require daily motivation on the part of users and thus have higher continuation and effectiveness rates. Couples also require fewer visits to health providers, thus saving time, effort and money and the patient load at health care facilities is lessened (1).

At a system level, the use of LARC methods can result in substantial cost savings for governments and contribute directly to reaching national and international health goals. Other indirect advantages are contributions in the reduction of high maternal mortality and morbidity, as well as elective abortions. According to a study done in different nations across the globe, more than 300,000 abortions per year in Vietnam, more than 100,000 in Ukraine, and 80,000 in Turkey could be averted by the use of LARC methods (2).

For many countries, continuing rapid population growth has become a problem due to non-use of effective contraceptive methods. Most of this growth is occurring in developing countries, where the fertility rate is very high. Africa's population is currently increasing faster than any other major region and projected to account for 25% of the world population by 2050 (3). The condition in Ethiopia is still similar to that of most African countries. The total fertility rate in the country is 4.8 and 5.6 in the Oromia region and the national population growth rate is estimated at 2.7% per year which is still very high when compared with other countries (4).

Despite their advantages, LARC methods are given in few areas, remain relatively low in coverage and are not offered as part of programs in the majority of national reproductive health and family planning programs. More than 350 million couples worldwide have limited or no access to effective and affordable FP, especially to LAPMs. Strong family planning programs offer a full range of contraceptive methods, but in many places, LAPMs are the least available, the least used and possibly the least understood methods by clients (1, 7).

About 25% of women and couples in sub-Saharan Africa who want to space or limit their births are not using any form of contraception. Even though women in sub-Saharan Africa reported that they prefer to space their births by more than two years, most of the births in the region are still spaced closer than that (8, 9).

Data from demographic and health surveys of sub-Saharan countries showed that very few women are currently using LARC methods due to several factors like myths and misconceptions, fear of side effects, the opposition of partner, lack of knowledge and others (10,11).

Only thirteen percent (13%) of the world's married women use Intrauterine Contraceptive Device (IUCD) as their method of contraception (13). In sub-Saharan Africa, in spite of its attractive features, IUD remains underutilized; only two percent of users rely on the IUD as

a method of contraception (14). In Ethiopia, the Contraceptive prevalence rate (CPR) is only 29%. IUCD, Implants and female sterilization are the least used methods of modern contraceptive each accounting only for 0.3%, 3.4% and 0.5% respectively (4).

Evidence from other countries and including Ethiopia depicted that factors such as fertility-related reason, opposition to use, lack of knowledge and method related reason could be considered as barriers to LARC methods utilization (16).

Most studies conducted previously on determinants of LARC methods utilization were concentrated more on identifying determinants related with socio-demographic, reproductive health factors and which is not sufficient to depict the full picture of the determinants of LARC methods utilization. Attitude, income, and level of knowledge on LARC methods could be important categories of determinants where most previous studies were failed to consider.

The finding of the study could help program managers, different stakeholders, and policymakers by providing important information to enhance the utilization of long-acting reversible contraceptive methods among married women of reproductive age group.

The prevalence of LARC methods utilization among married women in Ambo town is 10%, which is unacceptably very low as compared to the regional and national targets. The majority of married women in the town are not using LARC methods and even those who are using modern contraceptives are relying on SAFPMs (18). Therefore, this study was aimed to identify determinants of long-acting reversible contraceptive methods utilization among married women of the reproductive age group in Ambo town, Oromia region, west Ethiopia.

Methods

Study period and setting

The study was conducted from May 01-30/2016 in Ambo town, Oromia Regional State, located at 110 km distance on the west of Addis Ababa which is the capital city of the country. The town has six administrative kebeles. The total population of the town for the year 2016 was estimated to be 79, 059 (18).

The proportion of women in childbearing age was 22.2 % (17,551) of the population. The town has **one** General Hospital, two public health centers, two higher and three medium private clinics that provide LARC methods service as an integral component of other health care services (Fig 1).

All these facilities in the study area are providing LARC methods services freely and as the national government is distributing these methods freely, all of the methods are supposed to

be available.

Study design

A community based unmatched case-control study design was conducted to identify determinants of long-acting reversible contraceptive methods utilization among married women of the reproductive age group in ambo town, Oromia region, west Ethiopia.

Population

Cases were married women who were users of one of long-acting reversible contraceptive methods and Controls were married women who were non-users of any of modern contraceptive methods. Cases and controls resided in the study area at least for six months before the study period were included in the study.

Sampling: The sample size was determined by using EpiInfo software version 7.1 with an assumption of 95% confidence interval, power 80%, Case to control ratio 1:2; with inter-spousal discussion as exposure variable, 93.6% of cases and 83% of controls with exposure, Odds ratio of 3.0 (24) and 10% non-response compensation in both groups. Accordingly, 140 cases and 280 controls were included in the study.

All the six kebeles (the lowest administrative units in Ambo town) were included in the study. Before the actual study, the pilot survey was conducted by trained UHEW to identify & know the number of existing cases and controls in the six kebeles of Ambo town and the response rate was 100%. Cases were first identified by self-report that they were using the LARC method and then they were asked to bring a service identification card/appointment card to cross-check the service card against the method they were using. Controls were first identified by self-report and then cross-checked from the UHEW registration book to confirm they were non-users. A total of 1,302 cases and 1,806 controls were identified during the pilot survey. During the pilot survey, unique identification numbers were given for each case and controls which were also written on their residential homes to facilitate sampling process. A separate sampling frame was prepared for cases and controls. Then computer-generated random number method was used to select cases and controls.

Data collection procedure and measurement

Data was collected by face to face interview method (interviewer-administered method). Six twelve grade complete females who can speak the local language (Afan Oromo) were selected, trained and recruited as data collectors. Two Diploma nurses were employed as supervisors. The interview was delivered in Afan Oromo language. The data collectors were trained on the contents of the questionnaire, interview approach and confidentiality. The supervisors were trained on the contents of the questionnaire, interview approach and how to support data collectors. One data collector was assigned per each kebele and collected the data by moving from home to home. Supervisors supported data collectors by providing logistics required for data collection, collected the filled questionnaire from each data collectors, checked completeness and consistency of the collected data and submitted to Principal investigator daily.

Variables included in this study were; Socio-demographic and economic variables which comprises age, education, occupation, income; reproductive health-related variables which comprises number of parity, number of living children, sex composition of living children, history of stillbirths, history of induced abortion, intention to give birth in the future; individual-related variables which comprises knowledge of LARC methods, attitude toward LARC methods utilization, inter-spousal discussion, responsible person to limit number of children and source of information and Health facility related variables which comprises distance, expectation of availability of method mix and expectation of restriction to method use.

Knowledge of the respondents on LARC methods was measured by the total number of correct answers to 11 items on knowledge questions, with a minimum score of 0 and a maximum of 11. Those who scored 80% and above were declared as having good knowledge, those who scored 50-79% were declared as having moderate knowledge and those who scored less than 50% were declared as having poor knowledge (24).

The attitude of the respondents toward LARC methods was measured by Likert scale type questions. This was measured by the total number of correct answers from fifteen attitude questions toward LARC methods and the mean score of these answers was computed. Then respondents were declared as having a positive attitude and a negative attitude. Those who scored above mean to the correct answers from attitude measuring LARC methods questions were considered as having a positive attitude and those who scored mean and

below mean to the correct answers from attitude measuring LARC methods questions were considered as having a negative attitude (26).

Wealth index was computed as a composite indicator of living standard based on variables related to ownership of selected household assets, presence of livestock and materials used in the house. Variables that used to measure wealth index at household level were piped water source, flush toilet piped to sewer system, electricity, separated room for sleeping, separated room for cooking, refrigerator, mobile phone, fixed phone line, radio, electric mad, own home, cement roof type, vehicle, and livestock. The computation was made using principal component analysis (PCA) and composite variables were extracted by summing up the principal components into three components. The adequacy of the model for PCA was checked by the value of Kaiser-Meyer-Olkin measure of sample adequacy (KMOSA) and it became 0.78 and the sample was adequate. Eigen values were used to decide the number of PCs to be retained. Only PCs with Eigen values greater than 1.0 were retained. Three components explained the wealth index with the overall cumulative variance percentage of 69.4%. Detection of outliers & inter-item consistency was performed. To check inter-item consistency, Chronbach alpha for all factor lodgings of each component were computed and it became 0.82. Then, Quintiles of the wealth index was generated using the composite score.

Before data collection, both interviewers and supervisors were trained in the interview approach, ways to maintain confidentiality and how to keep the privacy of the study participants for three days period. Pre-testing of the questionnaire was also done on 21 married women of reproductive age group (7 cases and 14 controls) in Guder town, which is located at 12 km distance to the west of Ambo town. Finally, the data collection tool was refined based on the findings obtained from the pre-test.

Data processing and Analysis

Data were coded manually and checked for its completeness and consistency. Then data were entered and cleaned by EpiData version 3.1 and exported to SPSS version 21.0; where recoding, computing, and other statistical analysis were performed. Descriptive statistics were computed to explore frequency distribution, central tendency, variability (dispersion) and distribution of outcome and explanatory variables. The bivariable analysis was performed to identify candidate variables (P-value less than 0.25) for multivariable logistic regression. Finally, multivariable logistic regression was fitted using a standard enter method to identify independent predictors of LARC methods utilization. Hosmer and Lemeshow goodness of fit test was used to assess model fitness (P-value = 0.02). Adjusted odds ratios together with their corresponding 95% CI were calculated to assess the strength of association and statistical significance.

Ethical Assurance

Ethical clearance and supportive letter to undertake the study was obtained from the Ethical Review Board of the College of Health Science of Jimma University. Permission letter to conduct the research was obtained from the Oromia Regional Health Bureau. Prior to data collection, the participants were informed about the purpose of the study, their right to refuse participation, discontinue the interview or measurement and their full right to say "no" (opt-out), and it was clearly stated that their decision of "no" will not affect any of their right to health provisions intended for women. Confidentiality and privacy of the study participants were assured and protected by using a unique questionnaire identification number during an interview. Two women, one for IUCD and one for Implant, who were in a need of using LARC methods utilization were linked to health facilities where the services are available.

Results

Socio-demographic characteristics

Of the sample women, 139 cases and 279 controls were enrolled in the study, giving a response rate of 99% in both groups.

The mean age of overall respondents enrolled in the study was 28.6 years with a standard deviation of 5.7 years; with a minimum age of 16 and a maximum age of 44 years. The mean age of cases and control were 28.0 years (SD=6.34 years) and 27.84 years (SD=5.74 years) respectively. The majority of cases and controls were in the age range of between 25- 34 years (Table 1).

About 91(65.5%) cases and 195(69.9%) controls were Oromo by Ethnicity and 82(59.0) cases and 145(52.0) controls were Orthodox by religion (Table1).

Individual related characteristics

Regarding other individual related characteristics, 87.8% of cases and 63.6% of controls had a discussion with their husbands on long-acting reversible contraceptive use.

Based on LARC methods knowledge assessment 77(55.4%) cases and 99(35.5%) controls had good knowledge on LARC methods, 54(38.8%) cases and 110(39.4%) controls had moderate knowledge on LARC methods (Table 2).

The mean score of an attitude of the respondents was 49.43(SD=7.8). 106(76.3%) of cases and 107(38.4%) of controls had a positive attitude; whereas the rest of the cases and controls had a negative attitude towards LARC methods utilization (Table 2).

About 66.2% of cases and 44.8% of controls mentioned the Implanon method. Also, 18% of cases and 11.5% of controls mentioned Jadel. Similarly, 15.8% of cases and 43.7% of controls mentioned IUCD (Fig 2)

Reproductive health-related factors

The mean age at first marriage was 19.54 years (SD= 1.68 years). About 94(67.6%) cases and 245(87.8) controls were intended to give birth in the future (Table 3)

Health facility-related factors

Among all respondents; 44(31.7%) of cases and 160(57.3%) of controls expected that there was a restriction to method use at health facility, and 49(35.3%) of cases and 137(49.1%) of controls expected that all LARC methods were not available at health facilities (Table 3).

Bivariable analysis of determinants of long-acting reversible contraceptive methods utilization

Bivariable logistic regression analysis was performed to identify candidate variables for multivariable logistic regression analysis. Accordingly, age, wealth index, knowledge, attitude and other variables were identified as candidate variables for multivariable logistic regression (Table 4).

Independent predictors of LARC methods utilization among married women in Ambo town

The results from multivariable logistic regression showed that wealth index, spousal discussion, level of knowledge, attitude, intention to give birth in the future and expectation

of restriction to the method used at the health facility were independent predictors of LARC methods utilization.

The spousal discussion was the independent predictor of LARC methods utilization. Those women who discussed with their partners were nearly three times more likely to use LARC methods than those women who were not discussed (AOR=2.88, 95% CI: 1.3- 6.36).

The level of knowledge was another independent predictor of LARC methods utilization. Those women who had moderate and good knowledge on LARC methods were nearly 9 and 14 times more likely to use LARC methods than those women who had poor knowledge on LARC methods respectively (AOR=8.73, 95% CI:3.08-24.77, and AOR =13.99, 95% CI:4.93-39.71).

The positive attitude of the respondent was also another independent predictor of LARC methods utilization. Women who had a positive attitude were nearly 7 times more likely to use LARC methods than those women who had a negative attitude (AOR= 7.07, 95% CI: 3.77-13.24)

Intention to give birth in the future was another independent predictor of LARC methods utilization. Those women who intended to give birth in the future were 91% less likely to use LARC methods compared to those women who were not intended to give birth (AOR=0.09 95% CI:0.36-0.20).

Wealth index was another independent predictor of LARC methods utilization. Women from households in the poorest wealth quintile were nearly 7 times more likely to use LARC methods than those women from households in the richest wealth quintile(AOR= 6.83 95%CI 2.68- 17.38). Similarly, women from households in the medium wealth quintile were nearly 6 times more likely to use LARC methods than those women from households in the richest wealth quintile (AOR=5.83, 95%CI: 2.23- 15.22).

Discussion

The results from this study showed that wealth index, spousal discussion, knowledge, attitude, intention to give birth in the future and expectation of restriction to the method used at the health facility were independent predictors of LARC methods utilization.

The spousal discussion was found to be an independent predictor of LARC methods utilization. Those women who discussed on LARC methods with their partner were nearly three times more likely to use LARC methods than those who were not discussed on LARC methods. This finding is comparable with the studies conducted in Nekemte town, Debremarikos town, Hosanna town and the study conducted on determinants of long-acting contraceptive use among reproductive-age women in Ethiopia: Evidence from EDHS (19, 20, 24 and 35). This comparable finding might be due to the similarity in socio-demographic characteristics.

This study also depicted that knowledge was another independent predictor of LARC methods utilization. Those women who had moderate and good knowledge of LARC methods were nearly 9 and 14 times more likely to use LARC methods than those who had poor knowledge of LARC methods respectively. The finding of this study can be comparable with the study conducted in Hossana town, southern Ethiopia and Ugandain Lubaga division (24, 27).

The attitude of the respondent was another independent predictor of LARC methods utilization. Women who had a positive attitude toward LARC methods were nearly 7 times more likely to use LARC methods than those who had a negative attitude. The finding of this study is comparable with the study conducted in Mekele town, Northern Ethiopia and Ugandain Lubaga division (26, 27).

This study finding also depicted that expectation of restriction to the method used at the health facility was an independent predictor of LARC utilization. Those women who expected restriction to method use at health facilities were 80% less likely to use LARC methods than their counterparts.

Intention to give birth in the future was another independent predictor of LARC methods utilization. Those women who intended to give birth in the future were 91% less likely to use LARC methods compared to their counterparts. The finding of this study can be comparable with the study conducted in Hossana town (24). The comparability might be due to the similarity in the socio-demographic characteristics of the respondents.

Wealth index was also another independent predictor of LARC methods utilization. Women from households in the poorest wealth quintile were nearly seven times more likely to use LARC methods than those women from households in the richest wealth quintile. Similarly,

women from households in the third wealth quintile were nearly six times more likely to use LARC methods than those women from households in the richest wealth quintile. The possible justification for this could be the poorest and medium women in wealth are economically incapable of bringing up another child so that they utilized LARC methods than the richest.

The findings identified by this particular study can help program managers, different stakeholders, and policymakers by providing such important information to enhance the utilization of long-acting reversible contraceptive methods among married women of reproductive age group at large.

Also, more action has to be undertaken to increase women's knowledge on LARC methods utilization through promoting discussion between partners, to change the attitude of married women towards LARC methods utilization, emphasis has to be given to improve the norm of partner communication on LARC methods utilization, design scale-up strategy to change myths & misconceptions by the town health office in collaboration with the regional health office and various stakeholders working on this sector.

In this study, variables such as women's educational status, women's occupation, number of live children and fertility-related decisions were not independently associated with LARC methods utilization unlike in other studies conducted on determinants of LARC methods utilization in Ethiopia. This might be due to variation in socio-demographic factors among the study subjects.

Lack of adequate literature especially on LARC methods with case-control study design in the Ethiopian context in general and in the Oromia region in particular limits further elaboration of discussion and comparison.

Conclusions

Wealth index, spousal discussion, knowledge, Attitude, Intention to give birth in the future and woman's expectation of restriction to LARC methods uses at the health facility were determinants of long-acting reversible contraceptive methods utilization.

Stakeholders working on this sector should emphasize behavioral change communication to strengthen knowledge of long-acting reversible contraceptive methods, to strengthen interspousal discussion about modern contraceptives and to bring a good attitude toward long-acting reversible contraceptive methods.

This is, to mean, more actions have to be undertaken to increase women's knowledge on LARC methods utilization through promoting discussion between partners by the town health office in collaboration with regional health office and various stakeholders working on this sector.

Also, more action has to be undertaken to bring a good attitude of married women toward LARC methods utilization, emphasis has to be given to improve norm of partner communication on LARC methods utilization, design scale-up strategy to change myths & misconceptions by the town health office in collaboration with regional health office and various stakeholders working on this sector.

Additionally, creating continuous awareness on benefits and availability of LARC methods utilization by town health office in collaboration with HEWs and NGOs currently working in the study area is paramount.

Moreover, maximum efforts have to be done to establish strong referral linkage among health facilities, HEWs, currently being implemented and incorporated strategies at grass root level such as health development armies & one to five networks inclusive of married women together with their partners.

Abbreviations

Acronyms and Abbreviations

AOR: Adjusted Odds Ratio

COR: Crude Odds Ratio

CPR: Contraceptive Prevalence Rate

CI: Confidence Interval

DHS: Demographic and Health Survey

EDHS: Ethiopian Demographic and Health Survey

HF: Health facilities

HEW: Health extension Workers

IUD: Intra-Uterine Device

KM: Kilo meters

MOH: Ministry of Health

MC: Modern Contraception

NGO: Non-governmental organization

OR: Odds Ratios

USAID: United States Agency for International Development

REB: Regional Education Bureau

RHB: Regional Health Bureau

RH: Reproductive Health

TV: Television

FP: Family Planning

TFR: Total Fertility Rate

PC: Principal Component

PCA: Principal Component Analysis

LARC: Long-acting Reversible Contraceptive Methods

LAPM: Long-acting and Permanent contraceptive methods

SAFPM: Short-acting family planning methods

SD: Standard Deviation

LARC: Long-acting Reversible Contraceptive methods

ILAPM: Injectables, Long-acting, and Permanent Methods

UHEW: Urban Health Extension Workers

VIF: Variance Inflation Factor

Declarations

Ethics approval and consent to participate

Ethical clearance and supportive letter to undertake the study was obtained from the Institutional Review Board of College of Health Science, Jimma University (Ref. no. RPGC/439/06).

The ethics committee has approved the verbal consent procedure.

Permission letter to conduct the research was obtained from Oromia Regional Health Bureau (Ref. no. BEFO/AHBTM/18/2112).

Written consent was obtained from study participants of age greater than 16 years. Written informed consent was obtained from a parent or guardian for participants under 16 years old.

Consent to publish

Not applicable in this section

Availability of data and materials

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request

Competing interests

The authors declare that there is no competing of interest

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The source of funds for this research work was only Jimma University. The funding Institution has no role in the design, data collection, data analysis, and interpretation and manuscript writing.

Authors' contributions

DR, FT, and MN made a substantial contribution in conception, designing, data acquisition, statistical analysis, and interpretation of the results and drafting of the manuscript.

All authors have read and approved the manuscript to be published on BMC Women's Health Journal

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Tables

Table 1: Socio-demographic characteristics of married women in Ambo town; 2016

Variables		Cases	Controls
		n (%)	n (%)
Age in years	15-24	21(15.1)	73(26.2)
	25-34	97(69.8)	168(60.2)
	≥ 35	21(15.1)	38(13.6)
Ethnicity	Oromo	91(65.5)	195(69.9)
	Amhara	28(20.1)	50(17.9)
	Gurage	10(7.2)	23(8.3)
	Others*	10(7.2)	11(3.9)
Religion	Orthodox	82(59.0)	145(52.0)
	Protestant	46(33.1)	108(38.7)
	Others**	11(7.9)	26(9.3)
Women's Educational status	Informal	13(9.4)	25(9.0)
	Primary (grade 1-8)	20(14.4)	67(24.0)
	Secondary (grade 9-11)	49(35.2)	101(36.2)
	Tertiary(College & above)	57(41.0)	86(30.8)
Husband's Educational status	Informal	12(8.6)	20(7.2)
	Primary (grade 1-8)	33(23.7)	78(28.0)
	Secondary (grade 9-11)	35(25.2)	86(30.8)
	Tertiary (College& above)	59(42.5)	95(34.0)
	Housewife	67(48.2)	125(44.8)

Women's occupation	Government employee	38(27.3)	68(24.4)
	Merchant	21(15.1)	48(17.2)
	Others***	13(9.4)	38(13.6)
Husband's occupation	Government employee	46(33.0)	81(29.1)
	Merchant	65(46.8)	129(46.2)
	Daily laborers	15(10.8)	38(13.6)
	Others****	13(9.4)	31(11.1)
Wealth index	First quintile (Poorest)	40(28.8)	43(15.4)
	Second quintile (Poor)	29(20.9)	44(15.8)
	Third quintile (Medium)	12(8.6)	81(29.0)
	Fourth quintile (Rich)	42(30.2)	44(15.8)
	Fifth quintile (Richest)	16(11.5)	67(24.0)

Key -* is Sidama, Tigre, and Kambata; ** is Wakefata, Pagan;***----- is Driver & Mechanic

Table 2: Individual related characteristics of married women in Ambo town; 2016

Variables		Cases	Controls
		n (%)	n (%)
Have a discussion with her husband	Yes	122(87.8)	213(63.6)
	No	17(12.2)	66(23.7)
The main source of information about LARC methods	TV/Radio	71(51.1)	115(41.4)
	Urban Health extension (UHEW)	56(40.3)	132(47.4)
	Others*	12(8.6)	32(11.2)
Responsible person to decide to limit the number of children	Wife	10(7.1)	13(8.6)
	Husband	15(10.9)	91(4.7)
	Joint decision	114(82.0)	175(62.7)
Attitude toward LARC methods	Negative	33(23.7)	172(61.6)
	Positive	106(76.3)	107(38.4)
Knowledge of LARC methods	Poor	8(5.8)	70(25.1)
	Moderate	54(38.8)	110(39.4)
	Good	77(55.4)	99(35.5)

Key: * Indicates health workers other than UHEWs, friends, family.

Table 3: Reproductive health and health facility-related characteristics of married women in Ambo town; 2016.

Variables		Cases	control
		n (%)	n (%)
Ever pregnant	Yes	129(92.8)	210(75.3)
	No	10(7.2)	69(24.7)
Total number of pregnancy	< 3	67(52.3)	132(52.0)
	≥ 3	48(18.9)	66(48.0)
Age at first marriage	<18 years	28(20.1)	36(12.9)
	≥ 18 years	111(79.9)	243(87.1)
Age at first pregnancy	<18 years	21(15.1)	31(11.1)
	≥ 18 years	118(84.9)	248(88.9)
Age at first delivery	<18 years	19(13.6)	26(9.3)
	≥ 18 years	120(86.4)	253(90.7)
Experienced stillbirth	No	123(95.3)	190(90.5)
	Yes	6(4.7)	20(9.5)
Experienced abortion in lifetime	No	118(91.5)	159(75.7)
	Yes	11(8.5)	51(24.3)
Number of live births	≤ 2	59(45.7)	159(75.7)
	3-4	50(38.8)	35(16.7)
	≥ 5	20(15.5)	16(7.6)
Intention to give birth in the future	Yes	94(67.6)	245(87.8)
	No	45(32.4)	34(12.2)
Reason for intention to give birth in the future	Need more children	60(63.2)	156(69.6)
	Need of son	22(23.2)	19(8.5)
	Others*	13(13.6)	49(21.9)
Home distance from Health facility in minute walking hour)	<30 minute	62(45.3)	155(55.6)
	≥ 30 minute	77(54.7)	124(44.4)
Do you expect all LARC methods available at the health facility	Yes	90(64.7)	142(50.9)
	No	49(35.3)	137(49.1)

Do you expect restriction to method use at the health facility		Yes	44(31.7)	160(57.3)
No	95(68.3)	119(42.7)		

Key * indicates have no child before and child death

Table 4: Candidate variables for multivariable binary logistic regression analysis to assess determinants of long-acting reversible contraceptive methods utilization among married women in Ambo town; 2016

Variables		Cases N(%) 139(99)	Controls N(%) 279(99)	COR (95% CI)	P-value
Age	15-24	21(15.1)	73(26.2)	1	
	25-34	97(69.8)	168(60.2)	2.01(1.163,3.465)**	0.012
	≥ 35	21(15.1)	38(13.6)	1.92(0.934,3.95)*	0.76
Wealth index	First quintile(Poorest)	40(28.8)	43(15.4)	1	
	Second quintile (Poor)	29(20.9)	44(15.8)	0.71 (0.375,1.339)*	0.289
	Third quintile (Medium)	12(8.6)	81(29.0)	0.16 (0.076, 0.335)**	≤0.001
	Fourth quintile (Rich)	42(30.2)	44(15.8)	1.03 (0.561, 1.876)*	0.933
	Fifth quintile (Richest)	16(11.5)	67(24.0)	0.26(0.128,0.514)**	≤0.001
Discussion spousal communication)	No	17(12.2)	66(23.7)	1	
	Yes	122(87.8)	213(63.6)	2.22 (1.248,3.962)**	0.007
Level of knowledge	Poor	8(5.8)	70(25.1)	1	
	Moderate	54(38.8)	110(39.4)	4.29(1.292,9.566)**	≤0.001
	Good	77(55.4)	99(35.5)	6.81(3.089,14.992)**	≤0.001
Level of attitude	Negative	33(23.7)	171(61.6)	1	
	Positive	106(76.3)	108(38.4)	5.16(3.262,8.173)**	≤0.001
Ever pregnant	No	10(7.2)	69(24.7)	1	
	Yes	129(92.8)	210(75.3)	4.24(2.108,8.523)**	≤0.001
Attention to give birth in the future	No	45(32.4)	34(12.2)	1	
	Yes	94(67.6)	245(87.8)	0.29(0.175,0.480)**	≤0.001
The expectation of women on all AARCs available at HF	No	49(35.3)	137(49.1)	1	
	Yes	90(64.7)	142(50.9)	1.77 (1.65, 6.16)**	0.008
The expectation of women on restriction to methods in HF	No	95(68.3)	119(42.7)	1	
	Yes	44(31.7)	160(57.3)	0.34(0.224,0.529)**	≤0.001
Women's education	Informal	13(9.4)	25(9.0)	1	
	Primary (grade 1-8)	20(14.4)	67(24.0)	0.57(0.25,1.32)*	0.19
	Secondary	49(35.2)	101(36.2)	0.93(0.44, 1.98)*	0.86

	(grade 9-11)				
	Tertiary(College & above)	57(41.0)	86(30.8)	1.2(0.60, 2.69)*	0.53
Husband's education	Informal	12(8.6)	20(7.2)	1	
	Primary (grade 1-8)	33(23.7)	78(28.0)	0.97 (0.44, 2.12)*	0.93
	Secondary (grade 9-11)	35(25.2)	86(30.8)	0.68(0.41, 1.15)*	0.15
	Tertiary(College & above)	59(42.5)	95(34.0)	0.66(0.39, 1.09)*	0.104
Women's occupation	Housewife	67(48.2)	125(44.8)	1	
	Government employee	38(27.3)	68(24.4)	1.04(0.64, 1.71)*	0.87
	Merchant	21(15.1)	48(17.2)	0.82(0.45, 1.48)*	0.50
	Others	13(9.4)	38(13.6)	0.64(0.32, 1.28)*	0.21
Husband's occupation	Government employee	46(33.0)	81(29.1)	1	
	Merchant	65(46.8)	129(46.2)	0.89(0.55, 1.42)*	0.62
	Daily laborers	15(10.8)	38(13.6)	0.7(0.35, 1.39)*	0.31
	Others	13(9.4)	31(11.1)	0.74(0.35, 1.55)*	0.42
The main source of information about LARC methods	TV/Radio	71(51.1)	115(41.4)	1	
	UHEW	56(40.3)	113(47.4)	1.59(0.77, 3.31)*	0.21
	Others	12(8.6)	32(11.2)	1.096(0.53, 2.29)*	0.81
Responsible person to decide to limit the number of children	Wife	10(7.1)	13(4.7)	1	
	Husband	15(10.9)	91(8.6)	0.33(0.09, 1.17)*	0.09
	Joint decision	114(82.0)	175(62.7)	0.19(0.10, 1.035)*	0.08
Experienced tillbirth	No	123(95.3)	190(90.5)	1	
	Yes	6(4.7)	20(9.5)	0.46(0.181, 1.186)*	0.19
Experienced abortion	No	118(91.5)	159(75.7)	1	
	Yes	11(8.5)	51(24.3)	0.29(0.15, 0.58)*	0.06
Home distance from HF in	<30minutes	62(45.3)	155(55.6)	1	
	≥30minutes	77(54.7)	124(44.4)	1.51(1.02, 2.281)*	0.04

minutes

Table 5: Factors independently associated with LARC methods utilization among married women in Ambo town; 2016

Variables		Cases (n=139)	Controls (n= 279)	AOR (95% CI)	P- value
Wealth index	First quintile	40	43	6.83(2.680,17.381)	≤ 0.001
	Second quintile	29	44	0.84(0.309, 2.272)	0.729
	Third quintile	12	81	5.83(2.232, 15.218)	≤ 0.001
	Fourth quintile	42	44	3.21(1.312,7.848)	0.011
	Fifth quintile	16	67	1	
Discussion(spousal communication)	No	17	66	1	
	Yes	122	213	2.88(1.3,6.357)	0.009
Knowledge of LARC methods	Poor	8	70	1	
	Moderate	54	110	8.73(3.079,24.773)	≤ 0.001
	Good	77	99	13.99(4.933,39.71)	≤ 0.001
Attitude toward LARC methods	Negative	33	171	1	
	Positive	106	108	7.07(3.772,13.238)	≤ 0.001
Intention to give birth in the future	No	45	34	1	
	Yes	94	244	0.09 (0.36, 0.201)	≤ 0.001
The expectation of restriction to method use at HF	No	95	119	1	
	Yes	44	160	0.2(0.083,0.484)	≤ 0.001

Figures

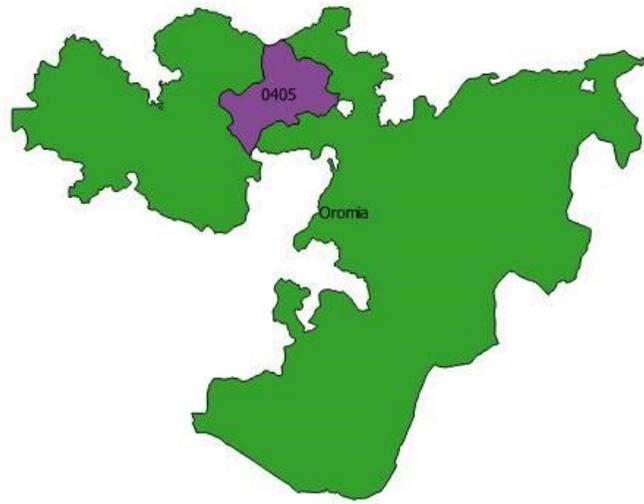


Figure 1

Map showing the study area, taken from Ambo town health office (18)

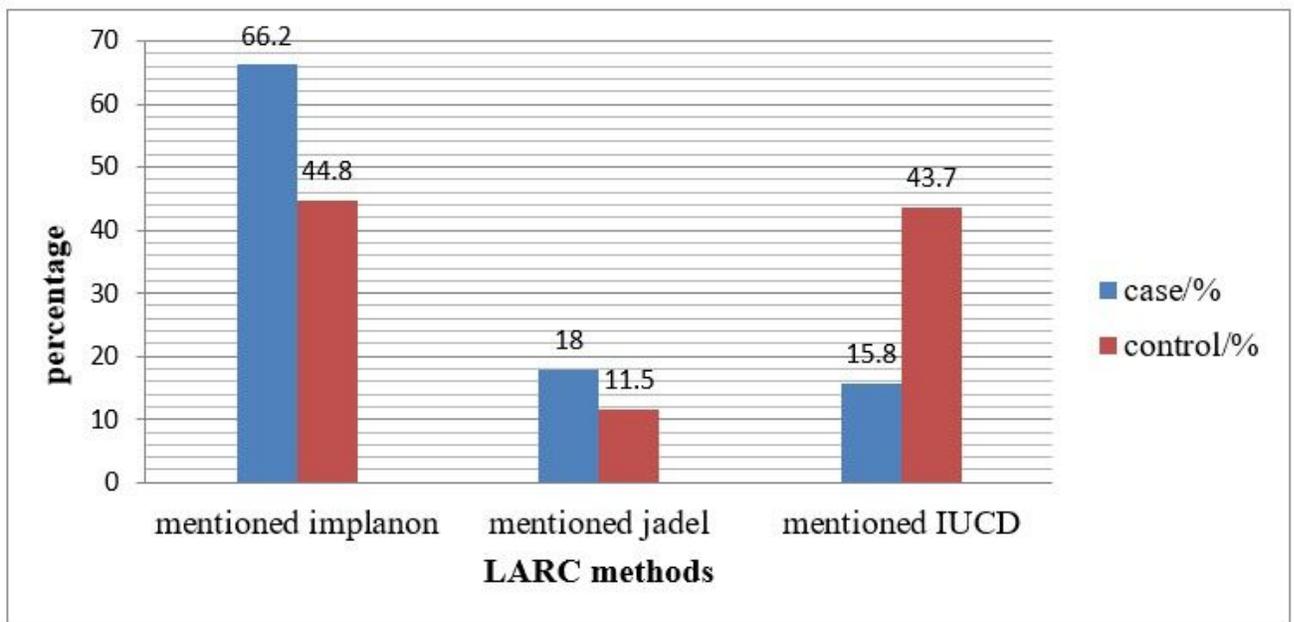


Figure 2

LARC methods mentioned by women

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