Determinants of Long-Acting Reversible Contraceptive Method Utilization among Married Women in Assosa Town in Western Ethiopia: A Case-Control Study

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ARTICLE INFO	ABSTRACT
	Background & aim: The prevalence rate of contraceptive use in Ethiopia is 42%; however, only 5% of Ethiopians use the long-acting contraceptive methods. This rate is 4.8% in Benishangul Gumuz Region in this country. Regarding this, the present study aimed to assess the determinants of long-acting reversible contraceptive method use among married women in Assosa town, Ethiopia. **Methods:** This community-based unmatched case-control study was conducted on 384 married women from April 26 to May 10, 2016. The study population consisted of the users (case group; n=128) and none-users (control group; n=256) of one of the long-acting methods. Multivariate logistic regression analysis was performed to identify the variables having a significant association. **Results:** A total of 382 women participated in this study with a response rate of 99.5%. The determinants of long-acting contraceptive use were identified as the lack of decision-making power (OR=0.29, 95% CI: 0.11-0.80), poor attitude toward such birth control methods (OR=0.13, 95% CI: 0.06-0.29), wrong expectation regarding method availability (OR=0.23, 95% CI: 0.07-0.73), low level of knowledge about long-acting contraceptive methods (OR=0.19, 95% CI: 0.08-0.47), future intention to get pregnant (OR=0.39, 95% CI: 0.18-0.82), and walking distance of more than 30 min from associated health facilities (OR=0.36, 95% CI: 0.15-0.85). **Conclusion:** Women's decision-making power, knowledge and attitude regarding contraceptives, expectation regarding method availability, distance from associated facilities, and intention to get pregnant in the future were identified as the independent predictors of long-acting contraceptive method use.

Introduction

Long-acting reversible contraceptive (LARC) methods are highly effective in the prevention of pregnancy; moreover, they are suitable and cost-effective for users over time. These methods facilitate substantial cost savings for the government and contribute directly to achieve a targeted high-level goal as compared to the short-acting techniques (1). Birth control implants (e.g., Implanon and Jadelle) and intrauterine contraceptive devices (IUCD) are among the contraceptive methods that are long-acting and reversible. The mentioned methods are effective up to 3-5 years and 10-12 years for the prevention of unwanted pregnancy, respectively. By far, they have been the most effective (>99%) contraceptive methods available. As a result, global and national family planning programs encourage giving due attention to LARC methods for women without compromising the right choice (1).

According to the World Health Organization (WHO) report, 287,000 maternal deaths occurred worldwide in 2014 during which developing countries accounted for 99% of such deaths. In

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the same vein, Sub-Saharan Africa and South Asia accounted for 87% of global maternal deaths. The high share of Sub-Saharan Africa and Asia in maternal death statistics is mainly due to the low utilization of modern contraceptives, especially the long-acting methods (2). Similarly, in a report by Bongart in 2012, it was shown that more than 200 million women in developing world wanted to avoid pregnancy but not using modern contraceptive methods, which could result in 54 million unintended pregnancies, more than 79,000 maternal deaths, and one million neonatal deaths each year (3).

Ethiopia is one of the Sub-Saharan African countries with the highest maternal mortality ratio. This country had 676 maternal deaths per 100,000 live births in 2011 and 412 maternal deaths per 100,000 live births in 2015. At least 35% of these deaths are due to unwanted pregnancies, as well as unsafely induced abortion and childbirth, which could be avoided by using appropriate contraceptive methods, particularly LARCs (4, 5). In Ethiopia, 5% of the currently married women use birth control implants as a long-acting method, 4.8% of which occurs in Benishangul Gumuz Region. Evidence also indicates that the majority of married women had information regarding long-acting reversible contraceptive methods; however, they did not use them practically (4, 5).

The majority of maternal and neonatal deaths can be prevented by means of proven interventions. Accordingly, the current policy of Ethiopia addresses transition from short-acting to long-acting methods; nonetheless, the utilization of these methods is very low. With this background in mind, the present study was conducted to identify the determinants of the low use of LARC methods. It is hoped that the findings of this study will be used by decision makers in Benishangul Gumuz Region in particular and Ethiopia in general in designing appropriate interventions to enhance the utilization of LARCs.

Materials and Methods

This study was conducted in Assosa town, Benishangul Gumuz Regional state, from April 26 to May 10, 2016, using an unmatched case-control design. Benishangul Gumuz is one of the nine regional states of the Federal Democratic Republic of Ethiopia. This region is located in the western part of Ethiopia, 662 km away from Addis Ababa. It is one of the developing regional states, where most of the health care coverage, including LARC use, is at a very low state.

Assosa town is the administrative town of Benishangul Gumuz regional state, which has four administrative *'kebeles'* (i.e., the smallest administrative unit) (6). The study population of the present study corresponded to a group of married women, living for a minimum of six months prior to the study period. The participants consisted of a case group entailing the married women of reproductive age using one of the LARC methods (e.g., Implanon, Jadelle, or IUCD) during the study period and a control group, including non-users (either using short-term contraceptives or not at all) of the LARC methods during the study period. The pregnant women reported as infertile were excluded from the study.

In this study, LARC methods were defined as those techniques that prevent pregnancy for a minimum of 3 years per application (e.g., Implanon, Jadelle, or IUCD). Knowledge of women was categorized as high/good (≥80%), moderate (60-79%), and low/poor (≤60%) based on 10 questions. The participants' attitudes were measured by calculating the mean score of 14 attitude-related items rated on a 5-point Likert scale (from strongly disagree=1 to strongly agree=5) categorized as good and poor attitudes.

The wealth index was assessed by computing principal component analysis (PCA) to produce composite variables. Based on this index, the respondents were categorized into five wealth categories (quintiles), where the 1st and 5th quintiles represented the poorest and richest states, respectively. Based on the decision-making power questions, the women were classified as those who decided by themselves or discussed it with their partner and those who could not decide on at least one question.

The sample size for this study was determined using Epi-info software (version 7.4.1) for the population proportion formula based on the following assumptions. Among the determinants considered, the partners' joint discussion and decision on contraceptive use were found to result in the largest sample size. Based on this, the rate of women having joint discussion and decision on contraceptive use

among non-LARC users (i.e., controls) were assumed to be 53.7% with an odds ratio of 2.00, taken from a previous study (7).

With 95% confidence level, 80% power, and case to control ratio of 1:2, the minimum sample size required was estimated at 348 (i.e., 116 cases and 232 controls). Considering 10% non-response rate, the final sample size was 384 (i.e., 128 cases and 256 controls). The study population was selected using the simple random sampling technique via computer-generated randomization out of 166 cases (i.e., users) and 3,025 controls (i.e., non-users), identified by presurvey enumeration.

In this study, the major outcome variable was LARC method utilization, whereas sociodemographic characteristics, individual factors, and reproductive health-related factors were considered as predictor variables.

Data collection was performed using structured interviews via a questionnaire prepared based on the related literature (8-13). The questionnaire was prepared in English language, and then translated to the local language (i.e., Amharic). To ensure consistency, the questionnaire was back-translated to English. The data were collected by eight nurses with a diploma degree who were supervised by two bachelor's degree holders.

Quality of data was controlled by designing appropriate data collection materials, pretest, training of data collectors and supervisors, and careful data entry. Reliability of the attitude questionnaire and wealth index was confirmed by achieving the Cronbach's alpha coefficients of 0.74 and 0.78, respectively. The validity of the interview questionnaire was determined using the content validity.

The data were coded and entered into Epi-data software (version 3.1) and exported into SPSS software (version 20.0) for analysis. Descriptive statistics (e.g., frequency, percentage, mean, and standard deviation) and cross tabulations were computed and presented in tables and figures to show a general picture of the data. The wealth index was computed as a composite indicator of living standard based on the variables related to the ownership of the selected household's assets, presence of livestock, and materials used in the house. The computation was made using PCA.

The variables were generated by summing up the principal components into three components. The adequacy of the model for PCA was checked by KMS and estimated at 0.78. Three components were explained in the wealth index with an overall cumulative percentage of 68%. Quintiles of the wealth index were generated using the composite score. The Chi-square test was calculated to check whether the assumption was met or not. Statistical tests were calculated at 95% confidence interval.

Variables with a p-value less than 0.25 in bivariate analysis were selected as candidate variables for the multivariate logistic regression model. Model fitness for multivariate analysis was checked using the Hosmer-Lemeshow test ($X^2=6.5$, $df=8$, $P=0.59$), and individual covariates were assessed by Wald test. Multicollinearity (at a variance inflation factor of >10) and interaction between the independent variables were checked. Multivariate binary logistic regression analyses were computed to identify the predictor variables. Adjusted odds ratios, together with 95% confidence intervals, were determined to measure the strength and level of significance of the association.

Ethical clearance was obtained from the Ethical Review Committee of the College of Health Sciences of Jimma University in Jimma, Ethiopia. Letter of cooperation and support from the university and the ethical approval letter were presented to the Benishangul Gumuz Regional Health Bureau and Assosa Town Administration. Confidentiality terms were assured using identification numbers in the questionnaire. In addition, the participants' privacy was guaranteed by removing names and other identifiers during the interview.

Results

A total of 382 (i.e., 128 cases and 254 controls) participants were included in the study with a response rate of 99.5%. The mean age of the participants was 27.3±5.2 years (28.4±5.6 for cases and 26.8±4.9 for controls; age range: 18-45 years). Most of the cases and controls were in the age range of 25-34 years. Regarding ethnicity, most of the women were from Amhara region (n=163, 42.67%; 41.4% and 43.3% of the cases and controls, respectively), followed by Oromia (n=125,

32.7%; 37.5% and 30.3% of the cases and controls, respectively) and Shinasha (n=30, 7.85%; 5.4 % and 9.1% of the cases and controls, respectively).

In terms of religion, nearly half of the respondents were Orthodox (n=187, 48.7%), followed by Muslim (n=94, 24.6%). With regard to the educational status, 46 (35.9%) and 75 (29.5%) women among the case and control groups had secondary education (9-12th grade),

respectively. Considering the wealth index of the respondents, the majority of the participants in the case group were in the poorest (n=34; 26.56%) and rich (n=28; 21.87%) states. Furthermore, most of the subjects in the control group were in the third quintile (n=58, 22.83%), followed by the second quintile (n=54; 21.3%). The Chi-square test was calculated to check the fulfillment of the assumption and compare ratios between the two groups (Table 1).

Table 1. Sociodemographic characteristics of the study population (n=382)

Sociodemographic characteristics	Cases (n=128) Frequency (%)	Controls (n=254) Frequency (%)	X² (p-value)
Woman's age (years)			
15-24	30 (23.4)	87 (34.3)	7.32 (0.02)
25-34	73 (57.1)	138 (54.3)	
≥35	25 (19.5)	29 (11.4)	
Woman's ethnicity			
Amhara	53 (41.4)	110 (43.3)	
Oromo	48 (37.5)	77 (30.3)	
Shinasha	7 (5.4)	23 (9.1)	4.62 (0.46)
Gumuz	10 (7.8)	17 (6.7)	
Berta	4 (3.1)	16 (6.3)	
Others*	6 (4.7)	11 (4.3)	
Woman's religion			
Orthodox	59 (46.1)	128 (50.4)	
Muslim	27 (21.1)	67 (26.4)	4.60 (0.20)
Protestant	36 (28.1)	48 (18.9)	
Catholic	6 (4.7)	11 (4.3)	
Woman's education level			
Informal (illiteracy)	6 (4.7)	11 (4.3)	
Informal (a minimum of literacy)	8 (6.3)	23 (9.1)	
Primary (1-8th grade)	46 (35.9)	74 (29.1)	3.04 (0.55)
Secondary (9-12th grade)	39 (30.5)	75 (29.5)	
Tertiary (>12th grade)	29 (22.7)	71 (28.0)	
Husband's education level			
Informal (illiteracy)	12 (9.4)	7 (2.8)	
Informal (a minimum of literacy)	8 (6.3)	7 (2.8)	
Primary (1-8th grade)	23 (18.0)	41 (16.1)	12.67 (0.01)
Secondary(9-12th grade)	42 (32.8)	87 (34.3)	
Tertiary (>12th grade)	43 (33.6)	112 (44.1)	
Woman's occupation			
Housewife	62 (48.4)	97 (38.2)	
Civil servant	25 (19.5)	48 (18.9)	
Merchant	17 (13.3)	39 (15.4)	6.05 (0.19)
Day laborer	15 (11.7)	35 (13.8)	
Student	9 (7.03)	35 (13.8)	
Husband's occupation			
Civil servant	51 (39.8)	92 (36.2)	
Merchant	38 (29.7)	95 (37.4)	8.24 (0.04)
Day laborer	33 (25.8)	42 (16.5)	
Student	6 (4.7)	25 (9.8)	
Wealth index			
First quintile (poorest)	34 (26.7)	40 (15.7)	
Second quintile (poor)	26 (20.3)	54 (21.3)	
Third quintile (medium)	17 (13.3)	58 (22.8)	9.46 (0.05)
Fourth quintile (rich)	28 (21.9)	51 (20.1)	
Fifth quintile (richest)	23 (17.8)	51 (20.1)	

* Gurage, Tigre or Kambata

As measured by the composite indicator of the 10 "Yes/No" knowledge questions, the majority of the participants in the case group (n=74, 57.8%) and about one-fourth of the individuals in the control group (n=63, 24.8%) had a good level of knowledge on LARC. In addition, 75% (n=96) 53.1% (n=135) of the case and control groups knew that LARCs are available as means either to limit or space pregnancy, respectively. In addition, the Urban Health Extension Workers were identified as the main source of information on LARC in both case (n=101, 78.9%) and control (178, n=70.1%) groups.

Based on the composite indicator score of 14 Likert scale questions, the mean attitude score of the respondents was estimated at 49.43±7.8. Furthermore, 78.9% (n=101) of the cases had a positive attitude towards LARC use, while this rate was 36.6% (n=93) in the control group.

Table 2. Reproductive health-related characteristics of the study population (n=382)

Past reproductive health characteristics	Cases (n=128)	Controls (n=254)	X^2 (P-value)
	Frequency (%)	Frequency (%)	
Having a prior pregnancy			8.1 (0.004)
Yes	115 (89.8)	198 (77.9)	
No	13 (10.2)	56 (22.0)	
Total number of pregnancies			2.2 (0.13)
< 3	67 (58.3)	132 (66.7)	
≥3	48 (41.7)	66 (33.3)	
Are all pregnancies wanted?			2.6 (0.10)
Yes	107 (93.04)	192 (96.97)	
No	8 (6.96)	6 (3.03)	
Age upon the first marriage			1.39 (0.23)
<18 years	18 (14.1)	48 (18.9)	
≥18 years	110 (85.9)	206 (81.1)	
Experience ING abortion in your lifetime			0.12 (0.72)
No	113 (88.3)	221 (87.0)	
Yes	15 (11.7)	33 (13.0)	
Number of live births			10.53 (0.005)
≤2	86 (67.2)	200 (78.7)	
3-4	37 (28.9)	53 (20.8)	
≥5	5 (3.9)	1 (0.5)	
Do you intend to give birth in the future?			15.7 (<0.001)
No	71 (55.4)	87 (34.3)	
Yes	57 (44.5)	167 (65.7)	

About 1 and 2 per 10 participants in the case (n=14, 10.9%) and control (n=46, 18.1%) groups had respectively a wrong perception that there is a restriction at health facilities regarding the method use. Similarly, 12 (9.4%) cases and 63 (24.8%) controls had the perception that LARC is not available at health facilities.

The mean ages of the participants upon the first marriage and first pregnancy were 19.5±3.7 and 21.1±3.1 years, respectively. The majority of

the cases (n=118, 89.8%) and controls (n=198, 77.9 %) had at least one pregnancy before. The Chi-square test was performed to check the fulfillment of the assumption and compare ratios between the two groups (Table 2).

After adjusting for the potential confounders, the spousal occupation, wealth status, and women's decision-making power, knowledge, attitude, distance from the related facility, expectation for method availability, and intention to give birth in the future were identified as the independent predictors of LARC use in the study area.

The spouses working as day laborers were more likely to utilize LARC than those working as civil servants (OR=3.37, 95% CI: 1.02-11.22). In addition, the women in the 5th (OR=0.11, 95% CI: 0.03-0.39) and 4th (OR=0.2, 95% CI: 0.06-0.68) quintiles, corresponding a better wealth status, were less likely to use LARC methods than those in the lowest quintile (i.e., 1st quintile). The

results also revealed that the women who were able to make decision by themselves were more likely to use LARC methods as compared to those who were not able to decide by themselves (OR=3.42, 95% CI: 1.25-9.34).

Furthermore, the women who had medium (OR=0.22, 95% CI: 0.089-0.53) or poor levels of knowledge about LARC methods (OR=0.05, 95% CI: 0.015-0.17) had a lower probability of utilizing such methods than those having good knowledge. Regarding the attitude, the subjects with a good (or positive) attitude toward LARC methods (OR=7.58, 95% CI: 3.42-16.84) were more likely to use these methods in comparison to those with a poor (or negative) attitude toward this issue.

The women intended to give birth in the future (OR=0.39, 95% CI: 0.18-0.81) had a lower probability of utilizing LARC methods than those who had no future intention for pregnancy. In addition, the subjects living at a walking

Table 3. Bivariate analysis of the determinants of long-acting reversible contraceptive methods utilization and the associated variables (n=382)

Variables		Cases (n=128)	Controls (n=254)	P-value	COR (95% CI)
Maternal age	15-19 years	30 (23%)	87 (34.2%)	1.00	1.00
	25-34 years	73 (57%)	138 (54.3%)	0.09	1.53 (0.9, 2.5)
	≥35 years	25 (19.5%)	29 (11.5%)	0.008	2.50 (1.3, 4.9)
Woman's occupation	Housewife	62 (48.4%)	97 (38.2%)	1.00	1.00
	Civil servant	25 (19.5%)	48 (18.8%)	0.48	0.82 (0.45, 1.4)
	Student	9 (7.03 %)	35 (13.8%)	0.02	0.42 (0.18, 0.89)
	Merchant	17 (13.3%)	39 (15.4%)	0.1	0.63 (0.3, 1.2)
	Day laborer	15 (11.7%)	35 (13.8%)	0.25	0.68 (0.35, 1.3)
Husband's occupation	Civil servant	51 (39.8%)	92 (36.2%)	1.00	1.00
	Student	6 (4.7%)	25 (9.8%)	0.08	0.43 (0.16, 1.12)
	Merchant	38 (29.7%)	95 (37.4%)	0.21	0.72 (0.43, 1.2)
	Day laborer	33 (25.8%)	42 (16.5%)	0.23	1.41 (0.80, 2.51)
Wealth index	Poorest	34 (26.56%)	40 (15.74%)	1.00	1.00
	Poor	26 (20.31%)	54 (21.25%)	0.08	0.56 (0.3, 1.1)
	Middle	17 (13.28%)	58 (22.83%)	0.003	0.34 (0.1, 0.7)
	Rich	28 (21.87%)	51 (20.07%)	0.18	0.64 (0.34, 1.2)
	Richest	23 (17.96%)	51 (20.07%)	0.06	0.53 (0.27, 1.03)
Spousal communication	No	29 (22.65%)	92 (36.22%)	1.00	1.00
	Yes	99 (77.34%)	162 (63.77%)	0.008	1.93 (1.19, 3.15)
Women decision-making power	No	12 (9.37%)	71 (27.95%)	1.00	1.00
	Yes	116 (90.6%)	183 (72.04%)	< 0.001	3.75 (1.9, 7.2)
Not taking LARC due to husband's dominance (opinion)	No	91 (71.09%)	211 (83.07%)	1.00	1.00
	Yes	37 (28.9%)	43 (16.9%)	0.007	1.99 (1.21, 3.3)
Getting information about LARC methodsfrom media (e.g., radio, TV)	No	74 (57.8%)	182 (71.65%)	1.00	1.00
	Yes	54 (42.2%)	72 (28.3%)	0.007	1.84 (1.2, 2.8)
Knowledge about LARC methods	Good	74 (57.8%)	63 (24.8%)	1.00	1.00
	Moderate	48 (37.5%)	89 (35%)	0.002	0.45 (0.28, 0.74)
	Poor	6 (4.7%)	102 (40.2%)	<0.001	0.05 (0.02, 0.12)

Attitude towards LARC methods	Negative	27 (21.1%)	161 (63.4%)	1.00	1.00
	Positive	101 (78.9%)	93 (36.6%)	<0.001	6.47 (3.94, 10.62)
Having a prior pregnancy	No	13 (10.2%)	56 (22.05%)	1.00	1.00
	Yes	115 (89.8%)	198 (77.95%)	0.005	2.50 (1.31, 4.77)
Number of pregnancies	≤2	67 (58.3%)	132 (66.7%)	1.00	1.00
	≥3	48 (41.7%)	66 (33.3%)	0.13	1.43 (0.89, 2.30)
Age upon the first marriage	<18 years	18 (14.06%)	48 (18.89%)	1.00	1.00
	≥18 years	110 (85.94%)	206 (81.1%)	0.24	1.42 (0.79, 2.56)
Number of live births	≤2	86 (67.2%)	200 (78.74%)	0.026	0.08 (0.01, 0.74)
	3-4	37 (28.9%)	53 (20.86%)	0.07	0.14 (0.02, 1.24)
	≥5	5 (3.9%)	1 (0.39%)	1.00	1.00
Intention to give birth (future)	No	71 (55.5%)	87 (34.2%)	1.00	1.00
	Yes	57 (45.5%)	167 (65.7%)	<0.001	0.42 (0.27, 0.65)
Distance from the health facility	<30 min	76 (59.4%)	119 (46.9%)	1.00	1.00
	≥30 min	52 (40.6%)	135 (53.1%)	0.021	0.60 (0.39, 0.92)
Distance from governmental health facility providing LARC	<5 km	43 (33.6%)	67 (26.4%)	1.00	1.00
	≥5 km	85 (66.4%)	187 (73.6%)	0.14	0.71 (0.44, 1.12)
Are all LARC methods available at health facilities?	No	12 (9.4%)	63 (24.8%)	1.00	1.00
	Yes	116 (90.6%)	191 (75.2%)	0.001	3.18 (1.65, 6.16)
Are there any restrictions on LARC methods at health facilities?	No	114 (89.1%)	208 (81.9%)	1.00	1.00
	Yes	14 (10.9%)	46 (18.1%)	0.07	0.55 (0.29, 1.05)

LARC: long-acting reversible contraceptive

distance of 30 min or more from a health facility were less likely to use these contraceptive methods than those living at a walking distance of less than 30 min (OR=0.36, 95% CI: 0.14-0.81). Furthermore, the women who perceived that LARC is available at health facilities were more probable to utilize such methods, compared to those having a perception regarding the unavailability of these methods at the related facilities (OR=4.29, 95% CI: 1.12-10.49). During the bivariate analysis of LARC utilization, 19 variables having a p-value less than 0.25 were selected for the final multivariate logistic regression (Table 3).

Table 4. Independent predictors of long-acting reversible contraceptive utilization among the study population (n=382)

Variables		Cases (n=128)	Controls (n= 254)	COR (95% CI)	P-value of crude	AOR (95% CI)
Husband's Occupation	Civil servant	51 (39.8%)	92 (36.2%)	1.00	1.00	1.00
	Student	6 (4.7%)	25 (9.8%)	0.43 (0.16, 1.12)	0.08	0.62 (0.12, 3.17)
	Merchant	38 (29.7%)	95 (37.4%)	0.72 (0.43, 1.2)	0.21	1.12 (0.42, 2.94)
	Day laborer	33 (25.8%)	42 (16.5%)	1.41 (0.80, 2.51)	0.23	3.37 (1.02, 11.22)
Wealth index	Poorest	34 (26.56%)	40 (15.74%)	1.00	1.00	1.00
	Poor	26 (20.31%)	54 (21.25%)	0.56 (0.3, 1.1)	0.08	0.29 (0.08, 0.97)
	Medium	17 (13.28%)	58 (22.83%)	0.34 (0.1, 0.7)	0.003	0.11 (0.03, 0.41)
	Rich	28 (21.87%)	51 (20.07%)	0.64 (0.34, 1.2)	0.18	0.20 (0.06, 0.68)
	Richest	23 (17.96%)	51 (20.07%)	0.53 (0.27, 1.03)	0.06	0.11 (0.03, 0.39)
Decision making-power	No	12 (9.38%)	71 (27.95%)	1.00	1.00	1.00
	Yes	116 (90.62%)	183 (72.05%)	3.75 (1.9, 7.2)	<0.001	3.42 (1.25, 9.37)
Knowledge about LARC methods	Good	74 (57.81%)	63 (24.8%)	1.00	1.00	1.00
	Moderate	48 (37.5%)	89 (35.04%)	0.45 (0.28, 0.74)	0.002	0.22 (0.09, 0.53)
	Poor	6 (4.69%)	102 (40.16%)	0.05 (0.02, 0.12)	<0.001	0.04 (0.01, 0.16)
Attitude toward LARC methods	Negative	27 (21.1%)	161 (63.38%)	1.00	1.00	1.00
	Positive	101 (78.9%)	93 (36.62%)	6.47 (3.94, 10.62)	<0.001	7.58 (3.43, 16.84)
Intention to give birth	No	71 (55.5%)	87 (34.2%)	1.00	1.00	1.00
	Yes	57 (45.5%)	167 (65.7%)	0.42 (0.27, 0.65)	<0.001	0.39 (0.18, 0.81)
Walking hour distance from health facility	<30 min	76 (59.38%)	119 (46.85%)	1.00	1.00	1.00
	≥30 min	52 (40.62%)	135 (53.15%)	0.60 (0.39, 0.92)	0.02	0.34 (0.14, 0.81)
Are all LARCs available at health facilities?	No	12 (9.38%)	63 (24.8%)	1.00	1.00	1.00
	Yes	116 (90.62%)	191 (75.2%)	3.18 (1.65, 6.16)	0.001	4.29 (1.37, 13.46)

Discussion

According to the results, Implanon, Jadelle, and intrauterine device were mentioned by 38.2% and 55.1%, 18.8% and 7.8%, and 66.4% and 49.6% of the cases and controls, respectively. Therefore, birth control implants, followed by IUCD, were the most frequently reported long-acting methods in the current study. This result is in line with those obtained by the Ethiopia Demographic and Health Survey (2011, 2014), in-depth analysis of 2000-2011, and a study conducted in Ghana in 2014 (3, 4, 14, 15). This similarity across Ethiopia might be explained by the strength of media advertisements advocating these contraceptives, establishment of the Health Development Army, and 1-5 network systems.

The findings of this study revealed that those women whose husbands work as day laborers (AOR=3.37, 95% CI: 1.01-11.22) were more likely to utilize LARC than those subjects with husbands working as civil servants. The respondents who were in the fifth (AOR=0.11, 95% CI: 0.03-0.39), fourth (AOR=0.20, 95% CI: 0.06-0.68), and third (AOR=0.11, 95% CI: 0.03-0.41) quintiles of the wealth index were respectively 89%, 80%, and 89% less likely to utilize LARC methods than those in the first quintile of the wealth index. However, the EDHS report revealed that those in the highest wealth index quintile used LARC methods more frequently than those in lower quintiles.

In addition, in a study performed in Arba Minch, Ethiopia, it was shown that those participants in the highest quintile of the wealth index had higher probability of using LARC methods for family planning (AOR=3.15, 95% CI: 1.26-7.94) as compared to those in the lowest wealth index quintile (13, 15). This discrepancy might be explained by methodological difference and economical insufficiency regarding caring for children (or childbearing).

In the current study, the women who had decision-making power were more likely to use LARC methods (AOR=3.42, 95%CI: 1.30-9.85)] than those without such power. This result is comparable with those of a study carried out in Ghana, Ethiopia (14-17). This similarity might be explained by the improvement of gender equality and joint discussion with husbands regarding deciding about birth control method use.

In the present study, those women who had a good level of knowledge were 4% and 22% more likely to utilize the LARC methods as compared to those with poor and medium levels of knowledge, respectively. This indicates that those respondents with poor (AOR=0.04, 95% CI: 0.01-0.16) and moderate (AOR=0.22, 95% CI: 0.09-0.53) levels of knowledge had 96% and 78% lower probability of using such methods, compared to those with a good level of knowledge. Our results also revealed that those respondents with positive attitudes toward LARC approaches were more likely to use these methods (AOR=7.58, 95% CI: 3.42-16.84) than their counterparts.

These findings are similar and comparable with those of a study conducted in Pakistan showing that negative attitude toward contraceptive was associated with no knowledge (or poor knowledge) of contraception (11, 18, 19). These results are also in line with those of a study performed in Hosaena town, Ethiopia, in which the level of the knowledge was the main determinant factor of LARC utilization (7, 20, 21). This consistency across studies might be explained by similarity in health policy, communication media advertisement, and methodological study.

Those women who had an intention to give birth in the future were 61% (AOR=0.39, 95% CI: 0.18-0.81) less likely to use the contraceptive methods under investigation. This finding is consistent with those of a study conducted in Hosaena town [AOR=0.5, 95% CI: 0.25-0.98] (7, 21). This agreement between the present and mentioned studies might be explained by methodological similarity, economical intention to care for children, and need for an extra child.

This study also showed that women's expectation regarding the 24-hour availability (opening hour) of LARC services and information provided by media were not among the significant independent predictors of LARC utilization. This finding is not in line with the results of a study conducted in Ghana reporting favorable opening hour and media exposure as the independent predictors of LARC utilization (14). This discrepancy between the two studies might be explained by the difference in study setting.

Our findings indicated that living at a

minimum walking hour distance of 30 min from health facility was an independent predictor of LARC utilization. Those women with a walking hour distance of ≥ 30 min from the health facilities providing LARC services were 66% less likely to utilize such services (AOR=0.34, 95% CI: 0.14-0.81) than their counterparts. This finding is also in line with those of the study conducted in Ghana (14, 22). This consistency might be explained by methodological similarity between the two studies. In this study, the women who expected that the health facilities to have all birth control methods were 4.29 (AOR=4.29, 95% CI: 1.37-13.46) time more likely to utilize LARC methods than their counterparts.

One of the limitations of the current study is the likelihood of the presence of recall bias due to the nature of the case-control design adopted in this study since the exposure status was assessed for different factors retrospectively. Another limitation was the lack of enough literatures for further discussion across the study area. Regardless of these drawbacks, the current study showed a cause and effect relationship among the examined variables and added valuable information to the literature regarding the knowledge and attitude of women of reproductive age towards utilizing LARC methods. Accordingly, these findings could encourage the health service managers to develop a strategy targeted towards the enhancement of women's participation in LARC program in Ethiopia, especially the study area.

Conclusion

Based on the findings, husband's occupation, wealth index, as well as women's decision-making power, knowledge, attitude, intention to get pregnant in the future, walking hour to (accessibility of) the health facility providing LARC services, and expectation regarding the availability of LARC methods at health facilities were identified as the determinants of LARC utilization in the study area. Therefore, more actions should be taken to promote discussion between partners in order to empower women in this domain by improving their decision-making power, knowledge, and attitude regarding LARC methods. In addition, the health facilities should be scaled up to provide outreach services for those living away from such facilities. Policy makers should also establish the scaling-up strategy for LARC method utilization and consider some programs targeted toward the improvement of the knowledge and attitude of the women in the highest and medium quintiles of wealth index. Finally, it is recommended to perform further operational research involving male partners using a qualitative approach.

Conflicts of interest

The authors declare no conflicts of interest.

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