Determinants of early discontinuation of long-acting and reversible contraceptive methods among women within childbearing age attending health facilities in Ethiopia, 2019

Dejene Edosa Dirirsa¹, Mukemil Awol Salo¹, Mogos Beya Gudeta¹, Merga Eticha kelbessa² and Mengistu Bekele Lammi²

Abstract

Objective: This study aimed to identify the determinants of early discontinuation of long-acting and reversible contraceptive methods among women within childbearing age in Ethiopia, 2019.

Methods: The institutional-based case–control study design was implemented from June to August 2019. Eligible study participants were sampled using systematic random sampling technique. Data were collected using structured and pre-tested questionnaire and entered into Epi Info and exported to SPSS version 20 for further analysis. All variables with a p value of <0.05 at odds ratio of 95% confidence interval in multivariable logistic regression analysis were considered as determinants of early discontinuation of long-acting and reversible contraceptive methods.

Results: A total of 825 study participants (206 cases and 619 controls) were included in the study. Decision-making on the use of contraception (adjusted odds ratio: 4.8, 95% confidence interval: 1.4–16.8 and adjusted odds ratio: 5.6, 95% confidence interval: 1.7–18.8), the women who got counseled about side effects of contraceptive methods being 84% less likely to discontinue long-acting and reversible contraceptive methods compared to the women of their counterpart (adjusted odds ratio: 0.16, 95% confidence interval: 0.15–0.4), having two or more children (adjusted odds ratio: 10, 95% confidence interval: 3.7–28), and desire to be pregnant (adjusted odds ratio = 0.15 95% confidence interval: 0.06–0.4) were determinants of early discontinuation of long-acting and reversible contraceptive methods.

Conclusion: According to the findings of this study, decision-maker on utilization of contraceptive methods, being counseled on side effects of contraception, number of children, and desire of woman to be pregnant were found to be determinants of discontinuation of long-acting and reversible contraceptive methods. Health care providers should strengthen providing pre-insertion counseling in accordance with the national guideline for family planning services, with an emphasis on potential contraceptive side effects and consideration of counseling on decision-making.

Keywords
Counseling, side effects, decision-making, discontinuation, long-acting contraceptives

Date received: 14 October 2021; accepted: 17 October 2022

Introduction
Family planning is defined as the ability of individuals and couples to anticipate and reach their desired number of children, through the use of contraceptive methods. Globally, utilization of modern contraceptive methods has increased in the last two decades. Long-acting and reversible contraceptive (LARC) methods are among the modern contraceptive methods used to space the childbirth.¹²
In Ethiopia, a total of 36% of women of reproductive age are using contraceptive methods; 35% use modern methods of contraception and 1% use traditional methods. However, more than a quarter (37%) discontinued using all modern methods of contraception for different reasons.\(^2\)

LARC methods help in meeting the demand for spacing births, which has the potential to reduce maternal mortality.\(^3\) The majority of maternal deaths are the direct outcome of complications encountered during pregnancy and arising from unsafe terminations of pregnancies.\(^4\) Contraception is an essential public health tool that helps the women to avert unplanned and/or unwanted pregnancies and prevent unsafe abortions.\(^5\)

The term “early discontinuation of long-acting and reversible contraceptive (LARCs) methods” refers to when the implants and intrauterine contraceptive devices (IUCDs) are initiated and subsequently stopped before its date of removal. Approximately, 20%–50% of long-term and reversible contraceptive methods users withdraw the method in the first year of use.\(^6\) Regardless of improvement in the availability and utilization of LARC methods, discontinuation is becoming a public health issue with rates varying greatly by population and country.\(^7,8\)

Early discontinuation of contraceptive methods causes unwanted pregnancy, lowering the effectiveness of family planning programs. In 2017, an estimated 206 million people in developing countries became pregnant, with 43% of those pregnancies being unwanted because of the early discontinuation of contraceptive methods.\(^9\) This leads to potentially unsafe induced abortions where the access to safe abortion is restricted.\(^10\)

According to the 2016 Ethiopian Demographic and Health Survey (EDHS), 35% of modern contraceptive methods users discontinued using the methods before its date of removal, and 11% of them were using LARC methods.\(^11\)

Similarly, study conducted in Dire Dawa revealed that 21.8% of contraceptive users discontinued the method within a year related to contributing factors such as age, lower parity, and not being decision-maker to use the methods.\(^12\)

Furthermore, studies conducted in Bahir Dar, Debre Markos and Andabet District, North-western Ethiopia have shown that having no living children, not being counseled for possible side effects, women’s educational status, lack competency of health care providers to provide LARC methods (poor quality of counseling), not being told to return to the health facility if any side effects experienced,\(^9\) having no appointment for follow-up (missed opportunities for screening), having no partner support and women who did not satisfy by the service provided were all factors associated with unplanned LARC use discontinuation.\(^13–15\)

Studies conducted in Southern Ethiopia, Tanzania, and West Africa have also shown that poor decision-making about the method, occupation, parity, marital status, and desire to have another child were all the associated factors of contraceptive method discontinuation.\(^16–18\)

In order to successfully reduce unplanned early withdrawal of LARCs and their related consequences, it is necessary to identify their determinants. However, most studies in Ethiopia have focused on determining the influencing factors and prevalence of a single contraceptive method (implants or IUCD) and have not been studied in the study area. This indicates a gap in information on the determinants of discontinuation of the use of all LARC methods in Ethiopia as well as in the study area. Therefore, this study aimed to identify the determinants of early discontinuation of LARC methods among women of childbearing age in Ethiopia, 2019.

Materials and methods

Study setting, design, and period

The institutional-based unmatched case–control study was conducted in Buno Bedele zone from May to August 2019. Buno Bedele zone has 12 districts, and based on the 2007 census conducted by the Central Statistical Agency of Ethiopia (CSAE), a total population was 829,663, of which 44,124 (3.47%) were females of the reproductive age group. The capital town of the zone is Bedele, located in the southwestern of Ethiopia at 483 km far from Addis Ababa. In the districts, there are 20 health centers and two public hospitals giving the maternal and child health services. The study was done at 12 health centers and one hospital.

Source and study population

All women of childbearing age (15–49) whoever used LARC methods in Buno Bedele zone health institutions were included in the study. Cases were childbearing age (15–49) women who requested unscheduled early removal of LARC methods in selected health institutions of Buno Bedele zone during the study period, whereas controls were childbearing age (15–49) women who requested the removal of LARC methods after completed time of usage in public health facilities of Buno Bedele zone during the study period.

Eligibility criteria

All women of childbearing age (15–49) who visited family planning clinic for the removal of LARC methods in the selected public health facilities of Buno Bedele zone during the study period were included in the study, while those who were critically ill and unable to respond for the required information were excluded from the study.

Variables

Outcome variable: LARC methods’ discontinuation and coded as: \(1=\) removal before recommended date and \(0=\) removal at recommended date.
Independent variables: socio-demographic characteristics, reproductive health variables, and contraceptive service-related characteristics.

**Operational definitions**

Childbearing age: women who are about to give birth within the age group of 15–49 years.

LARC methods: modern contraceptive methods prevent unintended pregnancy for the years but reversible when to have the child, namely, implants (Implanon, Jadelle, and Sino-plant) and IUCDs.

Women of childbearing age: the age at which women are usually able to have children between the ages of 15 and 49.

**Data measurement**

Cases: clients who requested for the removal of LARC methods (implants and IUCDs) for different reasons by healthcare providers before the recommended time, that is, Implanon < 3 years, Jadelle < 5 years, Sino-plant < 4 years and intrauterine devices (IUCD) < 10 years.

Controls: clients who requested for the removal of LARC methods (implants and IUCDs) for the reason of its expiry by healthcare providers at the recommended time, that is, Implanon at 3 years, Jadelle at 5 years, Sino-plant at 4 years, and intrauterine devices (IUCD) at 10 years.

Bias: in order to reduce bias, controls were selected from the population which produced the cases. For instance, the cases were selected from the users of LARC methods who requested for the removal before the time of removal, where controls were selected from LARC methods who requested for the removal at the time of the removal date.

**Sample size determination and sampling procedure**

The sample size was determined by a double population proportion formula by Epi Info statistical package version 7 and using the following assumptions: 95% confidence interval (CI), 80% power, and minimum odds ratio (OR) 2.5 and 1:3 ratio of cases to controls. Variables significantly associated with Implanon discontinuation were taken from the case–control study conducted at Bahir Dar, Ethiopia, and the sample size for each variable was calculated and the highest sample size was used. Based on this concept, the proportion of using Implanon to space childbirth indicated among cases was 94.3%, and in the control exposed group, those significantly at higher risk early discontinuation of LARC methods were 86.8% with OR = 2.5, 95% CI. Finally, by adding 10% of non-response rate, the total sample size was determined to be 825 (206 cases and 619 controls). Thirteen public health facilities were selected using the lottery method: 12 health centers and one public hospital. The total sample size was proportionally allocated among the selected health institutions based on the average number of women who requested for the removal of LARC methods within 1 year before the survey. Finally, cases were selected consecutively until the required sample size was reached, and controls were selected using a systematic random sampling technique after calculating K-interval for each facility until we got the proportional assigned sample size.

**Data collection process, instrument, and quality assurance**

Data were collected using structured and pretested questionnaire, which were adapted from different published literatures and were initially written in English, and then translated into Afan Oromo and again retranslated back to English to check for any inconsistencies or distortions in the meaning of terms and concepts. Socio-demographic characteristics, reproductive variables, and contraceptive service-related variables were all included in the questionnaire. Pretest was conducted on 5% of sample size other than study institutions and the tool reliability test was checked by Cronbach’s alpha, which was 0.77. Based on the pretest, a tool was amended to warrant clarity, wording, and logic sequence. Finally, data were collected by 13 trained data collectors using Afan Oromo language version questionnaire.

**Statistical analysis**

The data were entered into Epi Info and then exported to SPSS version 20 for further analysis. Descriptive analysis (such as frequencies, percentages, means, and standard deviation) and inferential analysis were carried out. Bivariate and multivariable logistic regressions were used to check the significance of the outcome variable and each of the independent variable using OR with 95% CI. All variables with p value of <0.25 at bivariate were considered as a candidate for multivariable analysis and those variables with a p value of <.05 in multivariable analyses were taken as determinants of early discontinuation of LARC methods among women of childbearing age. Multivariable logistic regression analyses were performed to control for possible confounding effects of the selected variables. The main assumption of the binary logistic regression model was tested. A multivariate linear regression model was used to assess the multicollinearity among the independent variables. There is no evidence of multicollinearity in the evaluation outcome. The Hosmer–Lemeshow model and the forward stepwise (likelihood ratio) approach were used to assess model goodness-of-fit. The model fitness test had a p value of 0.815. Missing variables were controlled by deleting the rows or columns having null values. If a column was found to have more than half of the rows as null, then the entire column was removed. The rows which were having one or more column values as null were also dropped.
Results

A total number of 363 women utilizing LARCs in the zone were identified (913 cases and 2724 controls). However, 153 women (42 cases and 111 controls) were excluded for the reason of critical illness and unable to respond for the required information. A total of 825 (206 cases and 619 controls) proportionally allocated study participants were selected using the systematic random sampling technique (k = 4) with a response rate of 100% (see Figure 1).

Socio-demographic characteristics among women of childbearing age (15–49) in Buno Bedelle Zone, Ethiopia, 2019

Half (50%) of the cases were between the ages of 15 and 24. Only 8 (3.9%) of the cases and 43 (6.9%) of the controls had completed college or higher education, whereas 62 (30.1%) of the cases and 196 (31.7%) of the controls could not read or write. The majority of the study participants were from the Oromo ethnic group, with 138 (67%) cases and 516 (83.4%) controls. The majority of the cases, 118 (57.3%), and controls, 386 (62.4%), were from rural areas (see Table 1).

Reproductive characteristics among women of childbearing age (15–49) in Buno Bedelle Zone, Ethiopia, 2019. This study revealed that nearly one-third (29.4%) of cases and 67.9% of controls had more than two children during the study period. More than three-quarters (79.9%) of the women, who discontinued LARC methods (cases), delivered their first child at the age of greater than 18 years, whereas 89.1% of the control group delivered their first child at the age of greater than 18 years. Among the study participants, more than half...
Table 1. Socio-demographic characteristics among women of childbearing age (15–49) in Buno Bedele Zone, Ethiopia, 2019.

| Characteristics          | Case (n = 206) | Controls (n = 619) |
|--------------------------|----------------|--------------------|
| Age in years             |                |                    |
| 15–24                    | 39 (18.9%)     | 260 (42%)          |
| 25–34                    | 103 (50%)      | 197 (31.8%)        |
| 35–44                    | 61 (29.6%)     | 106 (17.1%)        |
| ⩾45                      | 3 (1.5%)       | 56 (9.1%)          |
| Ethnicity                |                |                    |
| Oromo                    | 138 (67%)      | 516 (83.4%)        |
| Amhara                   | 39 (19%)       | 31 (5%)            |
| Tigré                    | 15 (7.2%)      | 52 (8.4%)          |
| Othersa                  | 14 (6.8%)      | 20 (3.2%)          |
| Religion                 |                |                    |
| Orthodox                 | 69 (33.5%)     | 223 (36%)          |
| Protestant               | 55 (26.7%)     | 177 (28.6%)        |
| Muslim                   | 76 (36.9%)     | 200 (32.3%)        |
| Othersb                  | 6 (2.9%)       | 19 (3.1)           |
| Educational level        |                |                    |
| Cannot read and write    | 62 (30.1%)     | 196 (31.7%)        |
| Can read and write       | 33 (16%)       | 73 (11.8%)         |
| Primary education        | 83 (40.3%)     | 198 (32%)          |
| Secondary education      | 20 (9.7%)      | 109 (17.6%)        |
| College and above        | 8 (3.9%)       | 43 (6.9%)          |
| Monthly income           |                |                    |
| <2000 ETB                | 113 (54.9%)    | 332 (53.6%)        |
| 2000–4000 ETB            | 61 (29.6%)     | 162 (26.2%)        |
| >4000 ETB                | 32 (15.5%)     | 125 (20.2%)        |
| Place of residence       |                |                    |
| Urban                    | 88 (42.7%)     | 233 (37.6)         |
| Rural                    | 118 (57.3%)    | 386 (62.4%)        |

*aOthers: Guraage, Somale, Agawu.
bOthers: Waaqeffataa, Catholic.

(54.9%) of the cases and nearly three-quarters (74.2%) of the controls expressed a wish to have additional children.

Of women who removed the LARC methods before its date of removal, 345 (67.4%) were counseled about contraceptive methods during antenatal care visits than those who discontinue the use of LARC methods, 49 (28.5%). Decision-making on LARC methods was more common by both women and their partners than by either women or their partners only (see Table 2).

Contraceptive service-related characteristics among women of childbearing age (15–49) in Buno Bedele Zone, Ethiopia, 2019

The majority of cases (54.9%) were not counseled by health care practitioners, while most of the controls 373 (60.3%) got contraceptive advice from health workers. Nearly half of the cases, 107 (51.9%), were not told about possible contraceptive side effects, whereas 43.6% of control groups were counseled about the side effects of contraceptive methods.

The majority of both cases (84.5%) and controls (89.2%) utilized implants as the last LARC method. In terms of satisfaction with the most recent contraceptive methods, a high number of cases (73.3%) were dissatisfied, while only 28.3% were not satisfied with the most recent contraceptive methods as shown in Table 3 (see Table 3).

Determinants of long-acting and reversible methods use discontinuation among women of childbearing age (15–49) in Ilu Abba BOR zone, Southwest Ethiopia, 2019

In the bivariate logistic regression, variables with p value of <0.25 were candidates for multivariable logistic regression analysis, such as women’s age in years, age at first marriage, decision-maker on the use of contraception, number of children (parity), counseled on side effects, and desire to be pregnant. In multivariable logistic regression, decision-maker on the use of contraception, counseled on side effects, number of children, and desire to be pregnant were found to be determinants of early discontinuation of LARC methods at p value of <0.05 with 95% CI.

The odds of early discontinuation of LARC methods use was 4.8 and 5.6 times greater among women who decide to use the methods by themselves and with their husbands than women whose husband decided to use the methods (adjusted odds ratio (AOR): 4.8, 95% CI: 1.4–16.8 and AOR: 5.6, 95% CI: 1.7–18.8), respectively.

The women who got counseled about side effects of contraceptive methods were 84% less likely to discontinue LARC methods usage before its expiry date as compared to women of their counterpart (AOR: 0.16, 95% CI: 0.15–0.4).
Table 2. Reproductive characteristics among women of childbearing age (15–49) in Buno Bedele Zone, Ethiopia, 2019.

| Characteristics                                      | Case (n = 206) | Controls (n = 619) |
|------------------------------------------------------|----------------|--------------------|
| Age at first marriage                                |                |                    |
| >18 years old                                        | 119 (57.8%)    | 403 (65.1%)        |
| <18 years old                                        | 87 (42.2%)     | 216 (34.9%)        |
| History of pregnancy                                 |                |                    |
| Yes                                                  | 172 (83.5%)    | 512 (82.7%)        |
| No                                                   | 34 (16.5%)     | 107 (17.3%)        |
| Age at first childbirth (cases n = 154 and controls n = 448) |                |                    |
| >18 years old                                        | 123 (79.9%)    | 399 (89.1%)        |
| <18 years old                                        | 31 (20.1%)     | 49 (10.9%)         |
| Number of childbirth (cases n = 143 and controls n = 414) |                |                    |
| Two or more                                          | 42 (29.4%)     | 281 (67.9%)        |
| One                                                  | 101 (70.6%)    | 133 (32.1%)        |
| History of abortion (cases n = 172 and controls n = 512) |                |                    |
| Yes                                                  | 18 (10.5%)     | 64 (12.5%)         |
| No                                                   | 154 (89.5%)    | 448 (87.5%)        |
| Recent desire for more children                      |                |                    |
| Yes                                                  | 113 (54.9%)    | 459 (74.2%)        |
| No                                                   | 93 (45.1%)     | 160 (25.8%)        |
| History of stillbirth (cases n = 154 and controls n = 448) |                |                    |
| Yes                                                  | 11 (7.1%)      | 34 (7.6%)          |
| No                                                   | 143 (92.9%)    | 414 (92.4%)        |
| Decision-maker on the use of contraception           |                |                    |
| Husband                                              | 41 (19.9%)     | 166 (26.8%)        |
| Wife                                                 | 54 (26.2%)     | 141 (22.8%)        |
| Both husband and wife                                | 111 (53.9%)    | 312 (50.4%)        |
| Information about contraceptive on ANC visits (cases n = 172 and controls n = 512) |                |                    |
| Yes                                                  | 49 (28.5%)     | 345 (67.4%)        |
| No                                                   | 123 (71.5%)    | 167 (32.6%)        |
| Desire to be pregnant                                |                |                    |
| Yes                                                  | 58 (28.2%)     | 131 (21.2%)        |
| No                                                   | 148 (71.8%)    | 488 (78.8%)        |

ANC: antenatal care.

Table 3. Contraceptive service-related characteristics of the study participants of last contraceptive use among discontinued user and continued user.

| Characteristics                                      | Cases         | Control       |
|------------------------------------------------------|---------------|---------------|
| Counseled by health care provider                     | Yes           | 93 (45.1%)    | 383 (61.9%)  |
|                                                     | No            | 113 (54.9%)   | 236 (38.1%)  |
| Information given about the side effects             | Yes           | 99 (48.1%)    | 349 (56.4%)  |
|                                                     | No            | 107 (51.9%)   | 270 (43.6%)  |
| Ever experienced side effects                        | Yes           | 149 (72.3%)   | 388 (62.7%)  |
|                                                     | No            | 57 (27.7%)    | 231 (37.3%)  |
| Information given to manage side effects             | Yes           | 77 (37.4%)    | 211 (34.1%)  |
|                                                     | No            | 129 (62.6%)   | 408 (65.9%)  |
| Type of the last modern method used                  | Implants      | 174 (84.5%)   | 552 (89.2%)  |
|                                                     | IUCD          | 32 (15.5%)    | 67 (10.8%)   |
| Satisfied with the last method                       | Yes           | 55 (26.7%)    | 444 (71.7%)  |
|                                                     | No            | 151 (73.3%)   | 175 (28.3%)  |
| Counseled on the other methods                        | Yes           | 101 (49%)     | 393 (63.5%)  |
|                                                     | No            | 105 (51%)     | 226 (36.5%)  |

IUCD: intrauterine contraceptive devices.
Table 4. Determinants of long-acting and reversible methods use discontinuation among women of reproductive age in Ilu Abba BOR zone, Southwest Ethiopia, 2019.

| Characteristics                      | Case (n = 206) | Controls (n = 619) | COR (95% CI)       | AOR (95% CI)       |
|--------------------------------------|----------------|--------------------|--------------------|--------------------|
| Women’s age (in years)               |                |                    |                    |                    |
| 15–24                                | 39 (18.9%)     | 260 (42%)          | 1                  | 1                  |
| 25–34                                | 103 (50%)      | 197 (31.8%)        | 0.29 (0.19–0.43)   | 0.37 (0.04–3.7)    |
| 35–44                                | 61 (29.6%)     | 106 (17.1%)        | 0.26 (0.16–0.41)   | 0.62 (0.07–5.5)    |
| ≥45                                  | 3 (1.50%)      | 56 (9.1%)          | 2.8 (0.84–9.4)     | 0.55 (0.05–5)      |
| Age at first marriage (in years)     |                |                    |                    |                    |
| <18                                  | 87 (42.2%)     | 216 (34.9%)        | 1                  | 1                  |
| >18                                  | 119 (57.8%)    | 403 (65.1%)        | 1.4 (0.99–1.88)    | 0.6 (0.3–1.8)      |
| Decision-maker on the use of         |                |                    |                    |                    |
| contraception                        |                |                    |                    |                    |
| Wife                                 | 54 (26.2%)     | 141 (22.8%)        | 0.65 (0.41–1.03)   | 4.8 (1.4–16.8)*    |
| Both husband and wife                | 111 (53.9%)    | 312 (50.4%)        | 0.7 (0.46–1.04)    | 5.6 (1.7–18.8)*    |
| No                                   | 107 (51.9%)    | 270 (43.6%)        | 0.72 (0.52–0.98)   | 0.16 (0.15, 0.4)*  |
| Number of children                   |                |                    |                    |                    |
| Two or more                          | 42 (29.4%)     | 281 (67.9%)        | 1                  | 1                  |
| One                                  | 101 (70.6%)    | 133 (32.1%)        | 0.2 (0.13–0.30)    | 10 (3.7–28)*       |
| Desire to be pregnant                |                |                    |                    |                    |
| Yes                                  | 58 (28.2%)     | 131 (21.2%)        | 1                  | 1                  |
| No                                   | 148 (71.8%)    | 488 (78.8%)        | 1.46 (1.02, 2.09)  | 0.15 (0.06, 0.4)*  |

COR: crude odds ratio; AOR: adjusted odds ratio; 95% CI: 95% confidence interval.
*Statistically significant at p < 0.05; 1 = reference.

The odds of discontinuation of LARC methods use was 10 times greater among women those who had one child as compared to women who had two or more children (AOR: 10, 95% CI: 3.7–28).

The desire for future pregnancy is associated with the utilization of LARC methods. In this study, women who had no desire for future conception were 85% less likely to discontinue the LARC methods than their counterparts (AOR: 0.15, 95% CI: 0.06–0.4) (see Table 4).

Discussion

The study results identified that decision-maker about contraception utilization, counseled on side effects of contraception, number of children, and desire of woman to be pregnant were found to be determinants of discontinuation of LARC methods.

Decision-making plays an important role in the use of LARC methods. Those women who decided to use LARC methods by themselves and with their husbands were more likely to discontinue the methods than women whose husbands decided the use of the contraceptive methods. This finding is in agreement with previously conducted research studies in Arba Minch, Ethiopia; evidence from the 2016 Ethiopian DHS and Dire Dawa city, Ethiopia revealed that women supported by their husbands for the decision of contraceptive use are less likely to remove LARC methods.4,11,12,20 A possible explanation could be disapproval of the husbands of contraceptive method utilization. In Ethiopia, men are the primary decision-makers for most family issues, including reproductive health issues like either continuing to use or removing contraceptive methods.

Furthermore, women who have received counseling about the side effects of contraceptive methods were 84% less likely to stop using LARC methods than their counterparts. This is in line with researches conducted in Humera, Wolaita Ethiopia, Debre Tabor town, and Dale District of South Ethiopia, which found that clients who did not get counseling about the adverse effects of contraceptive methods were more likely to stop using them.2,10,14,17 This could be due to counseling about the adverse effects of contraceptive methods reduces discontinuation because women can return to the health facility to receive treatment for any developed side effects and continue with treatment.

The odds of discontinuation of LARC methods use was 10 times greater among women those who had one child as compared to women who had two or more children. This is comparable with study conducted in Bahir Dar town and Debre Tabor town, and evidences from two multilevel analyses of Ethiopian DHS 2016 indicated that the odds of contraceptive methods discontinuation was higher for women who had less number of alive children as compared to those women who had more alive children.13,14,20,21 One possible explanation is that mothers who have fewer children but want to have more children stopped to use the contraception.

The desire for future conception is associated with the utilization of LARC methods. In this study, women who had no desire for future pregnancy were 85% less likely to discontinue the LARC methods than those who had desire for future pregnancy. This finding is consistent with the findings of studies conducted in Arba Minch, Ethiopia; Northern Ethiopia; and Hawassa town of Southern Ethiopia, which found women who planned to become pregnant in the near
future were more likely to discontinue LARC methods than
women who did not plan to become pregnant in the near future. This could be related to the fact that women with
few or no children are planning to have children and have stopped using contraception.

Limitations of the study
The limitation of this study was the study setting in which
the study was conducted at the health facilities, so the results
may not be representative of women who do not visit health
facilities.

Conclusion
According to the findings of this study, decision-maker (the
woman or male partner) about contraception utilization,
counseled on side effects of contraception, number of chil-
dren, and desire of woman to be pregnant were found to be
determinants of discontinuation of LARC methods. Health
care providers should be involved in providing pre-insertion
counseling in accordance with the national guideline for
family planning services, with an emphasis on potential con-
traceptive side effects and consideration of counseling on
decision-making.

Acknowledgements
We would like to thank Mettu University and colleagues for their
valuable support throughout the research process. Our acknowledg-
ment also extends to zonal health department and respective health
facility officials for permitting us to do so as well as involved data
collectors and supervisors for their commitment during the data
collection process.

Author contributions
Dejene Edosa Dirisira originated the idea and participated in the
proposal development, questionnaire development, data collection,
analysis. Mogos Beya Gudeta and Mukemil Awol Salo participated
on manuscript writing.
Merga Eticha Kelbessa and Mengistu Bekele Lammi are the co-
authors who have made a substantial contribution to the concept
and design, acquisition of data, analysis, and interpretation of data;
drafted the article or revised it critically for important intellectual
content; approved the version to be published; and agreed to be
accountable for all aspects of the work in ensuring that questions
related to the accuracy or integrity of any part of the work are
appropriately investigated and resolved. All authors read the final
version of the manuscript and approved this version of the manu-
script to be considered for publication.

Availability of data and materials
Data used to support the findings of this study are available from
the corresponding author upon request.

Declaration of conflicting interests
The author(s) declared no potential conflicts of interest with respect
to the research, authorship, and/or publication of this article.

Ethical approval
Ethical approval for this study was obtained from Mettu University
of Research Ethics Committee (REC) with the approval number
MEU/RC13/2019. A letter of authorization was obtained from the
Zonal Health Bureau and each facility administration. Informed writ-
ten consent was obtained from each participant and their family for
those under 18 years before proceeding data collection from them.

Funding
The author(s) disclosed receipt of the following financial support
for the research, authorship, and/or publication of this article: The
research was funded by Mettu University, and the funders had no
involvement in the study design, data collection, analysis, publica-
tion decision, or article writing.

Informed consent
Informed written consent was obtained from each participant and
their family for those under 18 years before proceeding data collec-
tion from them.

ORCID iDs
Dejene Edosa Dirisira https://orcid.org/0000-0003-2266-5006
Mukemil Awol Salo https://orcid.org/0000-0001-6923-6650
Mogos Beya Gudeta https://orcid.org/0000-0002-0804-2569

Supplemental material
Supplemental material for this article is available online.

References
1. Zeleke LB, Gella MM, Derseh HA, et al. Utilization of long-
acting contraceptive methods and associated factors among
female health care providers in East Gojjam Zone, Northwest
Ethiopia, in 2018. BioMed Res Int 2019; 2019: 5850629.
2. Belete N, Zemene A, Hagos H, et al. Prevalence and factors
associated with modern contraceptive discontinuation among
reproductive age group women, a community based cross-
sectional study in Humera town, northern Ethiopia. BMC
Womens Health 2018; 18: 190.
3. Tulu AS and Gebremariam T. Utilization of reversible long
acting contraceptive methods and associated factors among
women getting family planning service in governmental
health institutions of Gondar City Administration, northwest
Ethiopia. Int J Med Sci Public Health 2018; 8(2): 178–187.
4. Gultie T, Hailu D and Workineh Y. Predictors of long acting
contraceptives utilization among reproductive age women in
Arba Minch Zuria district, Ethiopia. Qual Prim Care 2016;
24(1): 17–22.
5. Tesfaye H, Negara E and Bayisa K. Early implanton discon-
tinuation and associated factors among women ever used
implanon in Mettu district, Oromia regional state, southwest
Ethiopia, 2021. Reprod Health 2021; 18: 176.
6. Thobani R, Jessani S, Azam I, et al. Factors associated with
the discontinuation of modern methods of contraception in
the low income areas of Sukh Initiative Karachi: a commu-
nity-based case control study. PLoS ONE 2019; 14(7): e021
8952.
7. Abebe BA, Assefa N and Mengistie B. Discontinuation of
reversible long-acting contraceptive and associated factors

Supplemental material for this article is available online.
among female users in health facilities of Hawassa city, southern Ethiopia: cross-sectional study. Open Access J Contracept 2020; 11: 113–123.
8. Mahumud RA, Hossain MG, Sarker AR, et al. Prevalence and associated factors of contraceptive discontinuation and switching among Bangladeshi married women of reproductive age. Open Access J Contracept 2015; 6: 13–19.
9. Nega G, Abera M and Tadele A. Discontinuation rate and associated factors among contraceptive implant users in Kersa district, southwestern Ethiopia. Arch Public Health 2021; 79: 75.
10. Tadesse A, Kondale M, Agedew E, et al. Determinant of implanton discontinuation among women who ever used implanton in Diguna Fango district, Wolayita Zone, Southern Ethiopia: a community based case control study. Int J Reprod Med 2017; 2017: 2861207.
11. Central Statistical Agency (CSA) and ICF. Ethiopia demographic and health survey 2016: key indicators report. Addis Ababa, Ethiopia: Central Statistical Agency (CSA); Rockville, MD: ICF, 2016.
12. Yifru GT, Haileyesus MT and Regassa BT. Determinants of modern contraceptive methods discontinuation among women within reproductive age in Dire Dawa city, Eastern Ethiopia. Int J Reprod Med 2020; 2020: 3059435.
13. Yehuala T, Melese E, Bogale KA, et al. Determinants of implanton discontinuation among women who use implanton at Bahir Dar town health institutions, Northwest Ethiopia, 2019: a case-control study. Evid Based Complement Alternat Med 2020; 2020: 9048609.
14. Asaye MM, Nigussie TS and Ambaw WM. Early Implanon discontinuation and associated factors among Implanon user women in Debre Tabor town, public health facilities, Northwest Ethiopia, 2016. Int J Reprod Med 2018; 2018: 3597487.
15. Dagnew GW, Gelaw YM, Asresie MB, et al. Level and timing of implanon discontinuation and associated factors among women who used implanon in Andabet District, public health facilities, North-West Ethiopia. BioMed Res Int 2021; 2021: 6647660.
16. Mahande MJ, Sato R, Amour C, et al. Predictors of contraceptive discontinuation among postpartum women in Arusha region, Tanzania. Contracept Reprod Med 2021; 6: 15.
17. Nageso A and Gebretsadik A. Discontinuation rate of Implanon and its associated factors among women who ever used Implanon in Dale District, Southern Ethiopia. BMC Womens Health 2018; 18: 189.
18. Ouédraogo AM, Baguiya A, Compaoré R, et al. Predictors of contraceptive method discontinuation among adolescent and young women in three West African countries (Burkina Faso, Mali, and Niger). BMC Womens Health 2021; 21: 261.
19. Dadi D, Bogale D, Minda Z, et al. Decision-making power of married women on family planning use and associated factors in Dinsho Woreda, South East Ethiopia. Open Access J Contracept 2020; 11: 15–23.
20. Fekadu GA, Omigbodun AO, Roberts OA, et al. Factors associated with early long-acting reversible contraceptives discontinuation in Ethiopia: evidence from the 2016 Ethiopian demographic and health survey. Arch Public Health 2020; 78: 36.
21. Weldemariam KT, Gezae KE and Abebe HT. Reasons and multilevel factors associated with unscheduled contraceptive use discontinuation in Ethiopia: evidence from Ethiopian demographic and health survey 2016. BMC Public Health 2019; 19:1745.