Level and determinants of long-acting family planning utilization among reproductive age women in Harar, Eastern Ethiopia

Astawus Alemayehu1,2,*, Abebaw Demissee1,3, Dereje Feleke4 and Maruf Abdella5

Abstract

Background: Ethiopia’s population is currently estimated to be 117,814,659 people and continues to have countries with the highest maternal mortality rates. Family planning is one of the most effective techniques for lowering mother and child mortality, in addition to limiting rapid population expansion.

Objective: The aim of this study was to assess level and determinants of long-acting family planning method among reproductive age women in Harar, Eastern Ethiopia, 2021

Method: Community-based cross-sectional study was conducted among 845 randomly selected reproductive age women. Data were collected by trained data collector using pretested structured questionnaire. Data were coded and entered into Epidata v.3 and analyzed using SPSS v.26 software. Descriptive statistics, bivariate and multivariate logistic regression analysis was used. Variable with p-value less than 0.05 was declared as statistically significant.

Result: The prevalence of long-acting family planning method was 74.7%, while 53.6% and 46.4% was from rural and urban, respectively. The mean age of participants was 28.5 (± 5.6) years. Married women four times (AOR: 4.1; 95% CI: 1.6, 10.4) more likely to use long-acting family planning method than single women. Women with educated husband four times (AOR: 4.4; 95% CI: 1.8, 10.6) more likely to use long-acting family planning method than women with illiterate husband.

Conclusion: There is high level of utilization of long-acting family planning. The women’s marital status, increased education level of husbands, increasing in age of women, intention to spacing birth, and having less than five children were found to significantly increase the utilization of long-acting family planning.

Keywords
contraception, family planning, Harar, reproductive age women

Introduction

Family planning is one of the most effective techniques for lowering mother and child mortality, in addition to limiting rapid population expansion.1 It prevents unintended pregnancies that could lead to unsafe abortions, increasing the risk of death and illness for the mother.2 Evidence suggests that providing contraceptives can prevent 44% of maternal mortality.1 Beyond reducing maternal mortality, family planning helps to give couples the opportunity to invest more in the welfare of each child and promote the economic benefits; by reducing unintended pregnancies, it can benefit education of girls and create opportunities to participate more fully in society, including paid employment.3,4

1Department of Nursing, Rift Valley University, Harar, Ethiopia
2Department of Public Health, Harar Health Science College, Harar, Ethiopia
3Department of Anesthesia, Harar Health Science College, Harar, Ethiopia
4Department of Health Informatics, Harar Health Science College, Harar, Ethiopia
5Department of Education, Rift Valley University, Harar, Ethiopia

Corresponding authors:
Abebaw Demisse, Department of Nursing, Rift Valley University, Harar Campus P.O Box: 1495, Harar, 0111, Ethiopia.
Email: abebawdemissie@yahoo.com

Astawus Alemayehu, Department of Nursing, Rift Valley University, Harar Campus P.O Box: 1495, Harar, 0111, Ethiopia.
Email: astawusalemayehu@gmail.com

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (https://creativecommons.org/licenses/by-nc/4.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).
World Health Organization has classified contraceptives according to their efficacy; long-acting contraceptive methods (LACMs), such as intrauterine contraceptive device (IUCDs), implants, vasectomy, and tubal ligation, are in the top tier; combined hormonal and progesterone-only treatments are in the second tier, and barrier methods and fertility awareness are in the third tier.5

LACMs can prevent unintended pregnancy and pregnancies that are closely spaced.5 Despite its effectiveness in improving maternal health, LACMs approaches have had a low level of acceptance and use by the general public.6

Long-term reversible contraception can be protective against some forms of cancer and significantly lower rates of unintended pregnancies owing to less user error compared to other methods.7,8

In Sub-Saharan Africa, the utilization of LACMs was influenced by several factors, including sociodemographic characteristics (age, education, number of children), sociocultural (family pressure, social stigma, myths), and behavior of specific groups of women and health facilities factors (provider attitude, access, quality of service).9–13

Ethiopia’s population is currently estimated to be 117,814,659 people, based on the Worldometer interpretation of the most recent United Nations data, and it is one of the countries with the highest total fertility rate.15

Ethiopia continues to rank among the countries with the highest maternal mortality rates. In Ethiopia, the maternal mortality rate was 412/100,000 live births.15 The country has made progress in lowering maternal death but still has a high rate of maternal mortality.16

There is low utilization of LACMs in Sub-Saharan Africa.17 Moreover, in Ethiopia, the prevalence of LACMs usage was low.18 Low usage of long-acting family planning (LAFP) related to decrease in weight, feeling of lack of sensation on the arm, and bleeding.19

The majority of previous research has attempted to assess LACMs usage among women who visit a healthcare facility. No study has been undertaken in the study area to examine LAFP utilization at the community level; the objective of this study was to assess the level of utilization of LAFP methods and determinant factors among reproductive age women in Harar, Eastern Ethiopia.

Method and material

Study area

Harari region is one of the 10 regions in Ethiopia which is located 526km away from the capital city of Ethiopia, with an estimated area of 334 km², and the estimated total population of the Harar town is 246,000. Approximately, 60% of the population is living in urban areas. There are nine numbered woredas in the Harari region. Under the woreda, there are 19 cities kebeles and 17 rural kebeles. This study was conducted in Harar, Eastern Ethiopia from 12 January to 22 January 2021. A community-based cross-sectional study design was used to assess the level and determinants of LAFP among reproductive age women in Harar, Eastern Ethiopia.

Sample size determination sampling technique

We use 423 samples which are calculated using single proportion formula with 95% of confidence interval and 5% margin of error, 10% non-response rate, and assumption of 50% proportion. Then multiplying by two design effects

$$n = \frac{Z^2 \times p(1-p)}{d^2} = n = \frac{(1.96)^2 \times 0.5(1-0.5)}{0.05^2} = 384,$$

$$384 \times 2 = 768,$$ by adding 10% (77) = 845

The study participants were classified into two strata based on their residence area (urban and rural). Finally, this study was conducted among randomly selected 845 reproductive age women in each stratum. All 15–49 years aged women in Harar were our source population. Whereas, all 15–49 years aged women randomly selected from each stratum are our study unit.

Eligibility criteria

Study participants who are volunteered to participate in the study during data collection period were included in the study. Those who do not have the willingness to participate in the study were excluded from the study.

Data collection tool and procedure

Data were collected by face-to-face interview method using the pretested structured questionnaire. The questionnaire was prepared in the English language which is adapted after reviewing relevant literature. The questionnaire was consisting of three parts, which consist all necessary sociodemographic variables (age, educational status, occupation, marital status, educational level, etc.), variables regarding reproductive factors (age at first marriage, parity, and gravidity) as exposure variables, and the current utilization of the LAFP method was our outcome variable. Data were collected by four students from second year health informatics students.

Data quality control

To assure the quality of data, 3-day training was given for data collectors on how to collect data and interviewing techniques. However, 5% of the questionnaire was pretested on Hakim Woreda, checked for consistency, and necessary revisions were made. Close supervision of the data collector was made by the authors. Collected data were checked both in the field at the end of each day after
data collection and before data entry for completeness and missing value. Double data entry was performed by two authors (A.D. and A.A.).

**Data processing and analysis**

After data were collected, checked for consistency, clarity, and completeness, data were entered into Epidata version 3.0 and transported to statistical package for social science (SPSS) v.26 for analysis. Descriptive statistics were computed to summarize the result in the form of percentage, mean, and standard deviation. Bivariate and multivariate analysis was computed to assess the association between the dependent and independent variables and to control possible confounding variables, respectively. Finally, those variables in the second model with a p-value less than 0.05 were declared as statistically significant. We have used STROBE checklist for cross-sectional study design for writing the finding of the study.

**Ethical consideration**

The official letter was obtained from Rift Valley University, Institutional Health Research Ethical Committee (IHREC; IHREC/006/2021). After telling the participants the importance of the study and that there was no risk to participating in this study, including maintenance of confidentiality, oral informed consent was taken from each study participant. This is because written consent was not feasible as some of the participants may be illiterate. Then, the data collector asks the interviewee whether they are willing to participate in a study before each interview. If the participant agrees to participate, the data collector marks [Yes] in the informed consent form and signs his signature. The data collector can also mark [No] if the person refuses to participate.

**Result**

**Sociodemographic characteristics of the study participant**

A total of 845 study participants were included in the study, which is a 100% response rate. The mean age of participants was 28.5 (± 5.6) years. Out of 845, a majority (92.7%) were married. Regarding their occupational status, most of them, 398 (47.1%), were housewives (Table 1).

**Reproductive characteristics of women**

Out of 845 reproductive age women, the majority, 635 (75.1%), of them married at an age of ≥ 18 years with a mean age of 19.3 (± 2.7) years. Most of them, 673 (79.6%), have less than five children, 147 (17.4%) have no children (Table 2).

**Awareness about LACM**

Out of 845 women majority, 740 (87.6%) knew about LACM, among this, 542 (73.3%) and 198 (26.7%) of them knew about implant and IUCD, respectively (Figure 1). Among 738, women who know about the LAFP method, 420 (56.9%) were in the 25–34 years age group, 177 (23.9%) in < 25 years, and the rest is in 35–49 years of age.

**Source of information about LACM**

Out of 740 women, who knew about LACM, the majority, 370 (50%) sources of information were from television, 227 (31%) from health professionals, 81 (11%) from radio, 53 (7%) from their friends, and only 9 (1%) from a newspaper (Figure 2).

**Utilization of LACMs**

Out of 845 women, 631 (74.7%) utilize long-acting methods, among this, 489 (77.5%) utilized implants, and 142 (22.5%) utilized IUCD. The majority 483 (76.5%) were from government institutions, 147 (23.3%) from non-governmental organizations (NGOs), and only 1 (0.16%) from private institutions (Table 3).

**Factors associated with utilization of LACMs**

Almost all sociodemographic variables show associations with the use of LAFP methods in a bivariate analysis model. However, multivariate analysis model for sociodemographic factor shows women in the 35–49 years age group two times (AOR: 2.2; 95% CI: 1.3, 3.8) more likely to use LAFP than women < 24 years age group. Married women four times (AOR: 4.1; 95% CI: 1.6, 10.4) more likely to use the LAFP method than single women. Women with educated husbands four times (AOR: 4.4; 95% CI: 1.8, 10.6) more likely to use LAFP methods than women with illiterate husbands. Women with 5–9 family size 36% less (AOR: 0.64; 95% CI: 0.4, 0.9) likely to use LAFP than women with < 5 family sizes (Table 4). Multivariate analysis model for reproductive factors shows women who have 1–4 children 18 times (AOR: 18; 95% CI: 1.03, 315) more likely to use LAFP than women who have no children. Women who planned to space birth three times (AOR: 3.1; 95% CI: 1.4, 6.8) more likely to use LAFP method than women planned to stop birth (Table 5).

**Discussion**

In this study, the mean age of study participants was 28.5 (± 5.6) years, this finding was consistent with a study conducted in South Ethiopia’s mean age of 28 years, but less than from a similar study conducted in northwest Ethiopia with a mean age of 29.6 (± 7.6) years. This slight difference could be due to sample size and geographical variation.
In our study, the prevalence of LAFP utilization was higher (74.7%), than other similar studies conducted in different parts of Ethiopia, 65.4% in Lay Armachiho, North Gondar, 5 20.9% in Adama, 22 20.4% in Gondar town, 23 and 19.5% in Gojjam. 21 Similarly, studies from Eastern and Southern Ethiopia indicate a prevalence of 38% in Harar, 24 22% in Hawassa, 25 and 7.3% in Jinka, 20 respectively. This difference could be due to the difference in sample size, sample population, and the fact, that our study was conducted at the community level. In addition to this, currently in Harari region, the number of urban and rural health extension workers who are trained to provide LAFP method was highly increased.

Our study also indicated that 92.7% of the married women utilize long-acting reversible contraceptive which is higher than the finding reported in 2005 and 2016 Ethiopia Demographic and Health Survey analysis which is only 12.3% of married women utilizing long-acting reversible contraceptive methods. 26 This difference could be the difference in the timing of the studies, population, and sampling differences.

In our study, 77.5% of women utilized implants; this is higher than the studies conducted in different parts of Ethiopia, which reported 26% in Hawassa, 25 20.4% in Gojjam, 27 17.5% in Arsi Negele, 28 and 16.1% in Adama, 22 but our finding is lower than the study from Gondar which reported 96.5%. 23 This difference could be due to the difference in sample size and population.

IUCD utilization in our study was 22.5%, which is higher than other similar studies conducted in different

Table 1. Sociodemographic characteristics of reproductive age group women in Harar, Eastern Ethiopia, 2021.

| Sociodemographic variables          | Rural (n = 422) | Urban (n = 423) | Total (N = 845) | 100% |
|------------------------------------|----------------|----------------|----------------|------|
| Age (years)                        |                |                |                |      |
| ≤24                                | 113            | 94             | 207            | 24.5 |
| 25–34                              | 237            | 240            | 477            | 56.4 |
| 35–49                              | 72             | 89             | 161            | 19.1 |
| Marital status                     |                |                |                |      |
| Single                             | 11             | 10             | 21             | 2.5  |
| Married                            | 396            | 387            | 783            | 92.7 |
| Divorced                           | 6              | 19             | 25             | 3    |
| Widowed                            | 5              | 3              | 8              | 0.9  |
| Separated                          | 4              | 4              | 8              | 0.9  |
| Occupational status                |                |                |                |      |
| Student                            | 35             | 7              | 42             | 5    |
| Housewife                          | 156            | 242            | 398            | 47.1 |
| Merchant                           | 38             | 72             | 110            | 13   |
| Civil servant                      | 166            | 25             | 191            | 22.6 |
| Labor work                         | 27             | 77             | 104            | 12.3 |
| Women level of education           |                |                |                |      |
| Unable to read and write           | 0              | 91             | 91             | 10.8 |
| Primary education                  | 0              | 311            | 311            | 36.8 |
| Secondary education                | 302            | 21             | 323            | 38.2 |
| Above secondary education          | 120            | 0              | 120            | 14.2 |
| Husband level of education         |                |                |                |      |
| Unable to read and write           | 5              | 31             | 36             | 4.3  |
| Primary education                  | 39             | 144            | 183            | 21.7 |
| Secondary education                | 137            | 196            | 333            | 39.4 |
| Above secondary education          | 241            | 52             | 293            | 99.8 |
| Average monthly income (ETB)       |                |                |                |      |
| <750                               | 48             | 83             | 131            | 15.5 |
| 751–1500                           | 96             | 167            | 263            | 31.1 |
| 1501–2250                          | 92             | 73             | 165            | 19.5 |
| 2251–3000                          | 90             | 52             | 142            | 16.8 |
| >3000                              | 96             | 48             | 144            | 17   |
| Family size                        |                |                |                |      |
| <5                                 | 376            | 299            | 675            | 79.9 |
| 5–9                                | 45             | 121            | 166            | 19.6 |
| >10                                | 1              | 3              | 4              | 5    |

ETB: Ethiopian birr; n: frequency number in each stratum; N: total number.
parts of Ethiopia, which reported 7.5% in Arsi Negele,28
4.6% in Adama,22 4.5% in Hawassa,25 3.5% in Gondar,23
and 2.3% in Gojjam.27 This difference could be due to the
difference in sample size, population, and high health cov-
erage of the Harari region.

In our study, increasing in age was found to be signifi-
cantly associated with the utilization of LAFP. This find-
ing was consistent with the studies conducted in Debre
Markos and Wondo Genet, Sidama.21,29 The reason for this
could be explained by the fact that with increased age the
women had already attained their fertility plan and use
long-acting contraceptives till menopause.

In our study, having an educated husband was found to
significantly increase utilization of LAFP methods, which
is consistent with the finding in Arsi Negele and Chencha,
Gamo Gofa, Zone.28,30 Other contradicted findings
reported from, however, different studies indicated that
educated women were found to significantly utilize
LAFP.31,32 This could be due to the fact that the more edu-
cated the husbands are the more knowledge they could
have on the benefits of LAFP. Thus, they can influence
their wives to utilize LAFP methods.

In our finding, married women are more likely to utilize
LAFP than unmarried women, which is consistent with the
findings from Gondar and Tigray.23,33 This could be due to,

Table 2. Reproductive characteristics of study participant
women in Harar, Eastern Ethiopia, 2021.

| Reproductive characteristics | n  | %   |
|------------------------------|----|-----|
| Age at first marriage (years) |    |     |
| <18                          | 210| 24.9|
| ≥18                          | 635| 75.1|
| Ever been pregnant           |    |     |
| Yes                          | 697| 82.5|
| No                           | 148| 17.5|
| No. of pregnancies           |    |     |
| 1                            | 261| 37.4|
| 2–4                          | 407| 58.4|
| ≥5                           | 29 | 4.2 |
| No. of children you have     |    |     |
| Have no children             | 147| 17.4|
| 1–4                          | 673| 79.6|
| 5–9                          | 22 | 2.6 |
| ≥10                          | 3  | 0.4 |
| Desired number of children in the future | | |
| 1–2                          | 382| 45.2|
| 3–4                          | 316| 37.4|
| ≥5                           | 147| 17.4|
| Desired child sex in the future | | |
| Male                         | 105| 12.4|
| Female                       | 115| 13.6|
| Both                         | 93 | 11  |
| No preference                | 532| 63  |
| Plan for future pregnancy    |    |     |
| Stop birth                   | 264| 31.2|
| Space birth                  | 531| 62.8|
| To get pregnant              | 50 | 5.9 |

n: frequency; %: percentage.

Figure 1. Awareness about LAFP among reproductive age
women in Harar, Eastern Ethiopia, 2021.

Figure 2. Source of information about LAFP among reproductive age
women in Harar, Eastern Ethiopia, 2021.
Table 3. Utilization of LAFP methods among women in Harar, Eastern Ethiopia, 2021.

| LAFP utilization characteristics       | Rural (n = 422) | Urban (n = 423) | Total (N = 845) | %    |
|----------------------------------------|----------------|-----------------|----------------|------|
| **Ever used LAFP**                     |                |                 |                |      |
| Yes                                    | 338            | 293             | 631            | 74.7 |
| No                                     | 84             | 130             | 214            | 25.3 |
| **Currently used LAFP**                |                |                 |                |      |
| Implant                                | 261            | 228             | 489            | 77.5 |
| IUCD                                   | 77             | 65              | 142            | 22.5 |
| **Place of getting the service**       |                |                 |                |      |
| Government institution                 | 238            | 245             | 480            | 77.5 |
| NGOs                                   | 100            | 47              | 147            | 23.3 |
| Private institution                    | 0              | 1               | 1              | 0.16 |
| **Reason for using LAFP**              |                |                 |                |      |
| No need for daily use                  | 77             | 71              | 148            | 23.5 |
| Husband’s approval                      | 33             | 31              | 64             | 10.2 |
| No bleeding                            | 37             | 55              | 92             | 14.5 |
| No weight gains                         | 22             | 18              | 40             | 6.3  |
| Effective in preventing pregnancy      | 40             | 55              | 95             | 15   |
| Told by a friend to use                | 26             | 9               | 35             | 5.6  |
| Chosen by the service provider         | 103            | 54              | 157            | 24.9 |
| LAFP: long-acting family planning; IUCD: intrauterine contraceptive device; NGOs: non-governmental organizations; n: frequency number in each stratum; N: total number.

Table 4. Sociodemographic factors associated with the utilization of LAFP method among reproductive age women in Harar, Eastern Ethiopia, 2021.

| Factor variables                        | Ever used LAFP | COR CI: 95% | p-value | AOR CI: 95% | p-value |
|-----------------------------------------|----------------|-------------|---------|-------------|---------|
|                                        | Yes            | No          |         |             |         |
| **Age (years)**                         |                |             |         |             |         |
| ≤24                                     | 141            | 66          | I       | I           |         |
| 25–34                                   | 361            | 116         | 1.5 (1, 2.1) | 0.04 | 1.5 (0.9, 2.1) | 0.074 |
| 35–49                                   | 129            | 32          | 1.9 (1.2, 3.1) | 0.01 | 2.2 (1.3, 3.8) | 0.005* |
| **Marital status**                      |                |             |         |             |         |
| Single                                  | 9              | 12          | I       | I           |         |
| Married                                 | 596            | 187         | 4.3 (1.7, 10.2) | 0.001 | 4.1 (1.6, 10.4) | 0.004* |
| Divorced                                | 17             | 8           | 2.8 (0.8, 9.5) | 0.09 | 2.4 (0.6, 8.7) | 0.19 |
| Widowed                                 | 5              | 3           | 2.2 (0.4, 11.8) | 0.35 | 2.3 (0.4, 13.6) | 0.34 |
| Separated                               | 4              | 4           | 1.3 (0.3, 6.8) | 0.73 | 1.2 (0.2, 6.4) | 0.86 |
| **Occupational status**                 |                |             |         |             |         |
| Student                                 | 27             | 15          | I       | I           |         |
| Housewife                               | 301            | 97          | 1.7 (0.9, 3.4) | 0.112 | 1.2 (0.5, 2.7) | 0.6 |
| Merchant                                | 73             | 37          | 1.1 (0.5, 2.3) | 0.81 | 0.9 (0.3, 2.1) | 0.74 |
| Civil servant                           | 153            | 38          | 2.2 (1.1, 4.6) | 0.029 | 1.3 (0.54, 2.9) | 0.59 |
| Labor work                              | 77             | 27          | 1.6 (0.7, 3.4) | 0.241 | 1.3 (0.5, 3.2) | 0.58 |
| **Women level of education**            |                |             |         |             |         |
| Unable to read and write                | 57             | 34          | I       | I           |         |
| Primary education                       | 236            | 75          | 1.9 (1.1, 3.1) | 0.013 | 1.4 (0.8, 2.6) | 0.22 |
| Secondary education                     | 237            | 86          | 1.64 (1.2, 2.7) | 0.047 | 1.01 (0.5, 1.9) | 0.97 |
| Above secondary education               | 101            | 19          | 3.2 (1.6, 6.1) | 0.001 | 1.2 (0.5, 2.9) | 0.67 |
| **Husband level of education**          |                |             |         |             |         |
| Unable to read and write                | 18             | 18          | I       | I           |         |
| Primary education                       | 130            | 53          | 2.4 (1.2, 5.1) | 0.016 | 2 (0.9, 4.5) | 0.88 |
| Secondary education                     | 236            | 97          | 2.4 (1.2, 4.9) | 0.012 | 2 (0.9, 4.6) | (Continued)
### Table 4. Reproductive factor associated with LAFP utilization among reproductive age women in Harar, Eastern Ethiopia, 2021.

| Factor variables | Ever used LAFP | COR CI: 95% | p-value | AOR CI: 95% | p-value |
|------------------|----------------|-------------|---------|-------------|---------|
|                   | Yes            | No          |         |             |         |
| Above secondary education | 247 | 46 | 5.4 (2.6, 11.1) | **0.001** | 4.4 (1.8, 10.6) | **0.001*** |
| Average monthly income (ETB) | | | | | |
| <750 | 100 | 31 | 0.6 (0.3, 1.01) | 0.57 | 0.9 (0.5, 1.8) | 0.78 |
| 751–1500 | 183 | 80 | 0.4 (0.2, 0.7) | **0.001** | 0.56 (0.3, 1) | 0.52 |
| 1501–2250 | 119 | 46 | 0.44 (0.2, 0.8) | **0.005** | 0.57 (0.3, 1.1) | 0.77 |
| 2251–3000 | 106 | 36 | 0.5 (0.3, 0.9) | **0.024** | 0.6 (0.3, 1.2) | 0.13 |
| >3000 | 123 | 21 | 1 | | |
| Family size | | | | | |
| <5 | 514 | 161 | 1 | | |
| 5–9 | 114 | 52 | 0.7 (0.5, 0.9) | **0.048** | 0.64 (0.4, 0.9) | **0.042*** |
| >10 | 3 | 1 | 0.9 (0.1, 9.1) | 0.95 | 1.2 (0.1, 13) | 0.86 |

LAFP: long-acting family planning; ETB: Ethiopian birr; COR: crude odds ratio; 95% CI: 95% confidence interval; Bold*: p-value < 0.05 significant; AOR: adjusted odds ratio; Bold: p-value < 0.25.

### Table 5. Reproductive factor associated with LAFP utilization among reproductive age women in Harar, Eastern Ethiopia, 2021.

| Factor variables | Ever used LAFP | COR CI: 95% | p-value | AOR CI: 95% | p-value |
|------------------|----------------|-------------|---------|-------------|---------|
|                   | Yes            | No          |         |             |         |
| Age at first marriage (years) | | | | | |
| <18 | 145 | 65 | 1 | | |
| ≥18 | 486 | 149 | 1.5 (1.03, 2.1) | **0.031** | 1.4 (0.9, 2.2) | 0.074 |
| Being pregnant | | | | | |
| Yes | 551 | 146 | 0.31 (0.2, 0.4) | **0.001** | 0.0 (0.0, 0.0) | 1 |
| No | 80 | 68 | 1 | | |
| No. of pregnancies | | | | | |
| 1 | 218 | 43 | 2.3 (0.9, 5.3) | **0.058** | 0.8 (0.12, 5.6) | 0.84 |
| 2–4 | 314 | 93 | 1.5 (0.7, 3.4) | 0.32 | 0.9 (0.14, 5.9) | 0.91 |
| ≥5 | 20 | 9 | 1 | | |
| No. of children | | | | | |
| Have no child | 79 | 68 | 2.3 (0.2, 26.2) | 0.49 | 12 (0.7, 20.5) | 0.77 |
| 1–4 | 535 | 138 | 7.7 (0.7, 86.1) | **0.095** | 18 (1.03, 3.15) | **0.048*** |
| 5–9 | 16 | 6 | 5.3 (0.4, 70.2) | **0.203** | 0.0 (0.0, 0.0) | .104 |
| ≥10 | 1 | 2 | 1 | | |
| Desired children in the future | | | | | |
| 1–2 | 253 | 129 | 1 | | |
| 3–4 | 268 | 48 | 2.8 (1.9, 4.1) | **0.001** | 0.9 (0.5, 1.8) | 0.87 |
| ≥5 | 110 | 37 | 1.5 (0.9, 2.3) | **0.057** | 0.5 (0.28, 1.2) | 0.14 |
| Desired sex of children | | | | | |
| Male | 92 | 13 | 3.4 (1.8, 6.2) | **0.001** | 1.9 (0.9, 3.7) | 0.73 |
| Female | 98 | 17 | 2.8 (1.6, 4.8) | **0.001** | 1.5 (0.8, 2.8) | 0.19 |
| Both | 82 | 11 | 3.5 (1.9, 6.9) | **0.001** | 1.9 (0.9, 3.9) | 0.07 |
| No preference | 359 | 173 | 1 | | |
| Plan for future pregnancy | | | | | |
| Stop birth | 150 | 114 | 1 | | |
| Space birth | 442 | 89 | 3.8 (2.7, 5.3) | **0.001** | 3.1 (1.4, 6.8) | **0.004*** |
| To get pregnant | 39 | 11 | 2.7 (1.3, 5.5) | **0.006** | 2 (0.8, 5.6) | 0.15 |

LAFP: long-acting family planning; COR: crude odds ratio; 95% CI: 95% confidence interval; Bold*: p-value < 0.05 significant; AOR: adjusted odds ratio; Bold: p-value < 0.25.
married women more likely to have an adequate number of children which compel them to utilize LAFP method.

**Limitation of the study**

Since the study used cross-sectional study design, it is difficult to establish a temporal relationship, which means, the temporal link between the outcome and the exposure cannot be determined because both are examined at the same time. Even if this study is conducted at community level, it does not incorporate qualitative method. If the study had used qualitative methods, it could provide more detailed in-depth information to explain complex issues, such as behavior, and attitudinal factors which may not be adequately addressed by quantitative method.

**Conclusion**

There is a high level of utilization of LAFP among reproductive age women in Harar. The women’s marital status, increased education level of husbands, increasing in age of women, intention to spacing birth, having less than five children were found to significantly increase the utilization of LAFP. To increase LACMs utilization, continuous targeted and tailored information should be provided by Ministry of Health and Regional Health Bureau through different media to the community at large and specifically to women regarding LACMs. Health institutions should regularly provide behavioral change communication about the benefits of LACM to all reproductive age women who came for routine services and on community outreach programs. Improving women’s access to formal education and economical participation would empower women to exercise the rights to make reproductive health decisions, including utilization of LACM. In addition, improving male involvement in family planning matters through tailored program outreach and education is essential to increase the utilization of LACM.

**Acknowledgements**

First, the authors thank almighty God. They also thank Mr. Merga Hirko for language editing of the article. Finally, they thank the Woreda Offices that allowed us to conduct the study and the study participants for their participation.

**Author contributions**

AA, AD, DF, and MA, participate in the study from the inception to design, acquisition of data, analysis, interpretation, and drafting of the article.

**Consent to participate**

After all study participants were informed of the aim of the study, Oral informed consent was obtained. They were also informed that they have the right to participate and withdraw from participation at any time, without any harmful events.

**Data availability**

Any time the corresponding author provides an additional resource on 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 letters were obtained from the Rift Valley University, Institutional Health Research Ethics Review Committee, with Ref.no. IHREC/006/2021.

**Funding**

The author(s) received no financial support for the research, authorship, and/or publication of this article.

**ORCID iD**

Astawus Alemayehu https://orcid.org/0000-0003-1384-7123

**Supplemental material**

Supplemental material for this article is available online.

**References**

1. Ahmed S, Li Q, Liu L, et al. Maternal deaths averted by contraceptive use: an analysis of 172 countries. *Lancet* 2012; 380: 111–125.
2. Kantorová V, Wheldon MC, Ueffing P, et al. Estimating progress towards meeting women’s contraceptive needs in 185 countries: a Bayesian hierarchical modelling study. *PLoS Med* 2020; 17(2): e1003026.
3. Speidel J, Raifman S and Thompson K. By slowing population growth, family planning can help address food insecurity and climate change, 2015, https://www.biologicaldiversity.org/programs/population_and_sustainability/pdfs/UCSF_Population_Climate_Food_Feb_3_2015.pdf
4. World Health Organization (WHO). Contraception, 2021, https://www.who.int/health-topics/contraception#tab=tab_1
5. Demekse CA, Kasahun AE, Belay WS, et al. Utilization pattern of long-acting and permanent family planning methods and associated factors: a community-based cross-sectional study in Ethiopia. *Open Access J Contracept* 2020; 11: 103–112.
6. Tesfa E and Gedamu H. Factors associated with utilization of long term family planning methods among women of reproductive age attending Bahir Dar health facilities, Northwest Ethiopia. *BMC Res Notes* 2018; 11: 926.
7. Maguire K and Westhoff C. The state of hormonal contraception today: established and emerging noncontraceptive health benefits. *Am J Obstet Gynecol* 2011; 205(Suppl. 4): S4–S8.
8. Winner B, Peipert JF, Zhao Q, et al. Effectiveness of long-acting reversible contraception. *New Engl J Med* 2012; 366: 1998–2007.
9. National Institute of Statistics of Rwanda (NISR) and Ministry of Health (MoH). Rwanda: demographic and
10. Alemayehu M, Belachew T and Tilahun T. Factors associated with utilization of long acting and permanent contraceptive methods among married women of reproductive age in Mekelle town, Tigray region, north Ethiopia. *BMC Pregnancy Childbirth* 2012; 12: 6.

11. Muhoza DN, Rutayisire PC and Umubyeyi A. Measuring the success of family planning initiatives in Rwanda: a multivariate decomposition analysis. *J Popul Res* 2016; 33: 361–377.

12. Eltomy E, Saboula N and Hussein AA. Barriers affecting utilization of family planning services among rural Egyptian women. *East Mediterr Health J* 2013; 19(5): 400–408.

13. Fekadu GA, Omigbodun AO, Roberts OA, et al. Determinants of change in long-acting or permanent contraceptives use in Ethiopia; a multivariate decomposition analysis of data from the Ethiopian demographic and health survey. *PLoS ONE* 2020; 15: e0227218.

14. Worldometer. Elaboration of data by United Nations, Department of Economic and Social Affairs, Population Division: world population prospects: the 2019 revision, 2021, https://www.worldometers.info/world-population/population-by-country/?x_cw_context_provider=safari

15. Central Statistical Agency (CSA) and ICF. Ethiopia: 2016 demographic and health survey key findings, 2017, https://dhsprogram.com/pubs/pdf/SR241/SR241.pdf

16. Central Statistical Agency (CSA) and ICF. Ethiopia: demographic and health survey 2016, 2017, https://dhsprogram.com/pubs/pdf/FR238/FR238.pdf

17. Bikorimana E. Barriers to the use of long acting contraceptive methods among married women of reproductive age in Kicukiro District, Rwanda. *Int J Sci Res Publ* 2015; 5: 513–521.

18. Central Statistical Agency (CSA). Ethiopia mini demographic and health survey 2014, 2014, https://www.statethiopia.gov.et/wp-content/uploads/2019/06/Ethiopia-Demographic-Health-Survey-Report-2014.pdf

19. Annafe M, Assefa N and Alemayehu T. Long-acting family planning method switching among revisit clients of public health facilities in Dire Dawa, Ethiopia. *Contracept Reprod Med* 2016; 1: 18.

20. Mekonnen G, Enqueselassie F, Tesfaye G, et al. Prevalence and factors affecting use of long acting and permanent contraceptive methods in Jimma town, Southern Ethiopia: a cross sectional study. *Pan Afr Med J* 2014; 18: 98.

21. Bulto GA, Zewdie TA and Beyen TK. Demand for long acting and permanent contraceptive methods and associated factors among married women of reproductive age group in Debre Marcos Town, North West Ethiopia. *BMC Womens Health* 2014; 14: 46.

22. Desalegn M, Belachew A, Gizaw M, et al. Utilization of long-acting and permanent contraceptive methods and associated factors among married women in Adama, Central Ethiopia: community based cross-sectional study. *Contracept Reprod Med* 2019; 4: 22.

23. Aregay W, Azale T, Sisay M, et al. Utilization of long acting reversible contraceptive methods and associated factors among female college students in Gondar town, northwest Ethiopia, 2018: institutional based cross-sectional study. *BMC Res Notes* 2018; 11: 862.

24. Shiferaw K and Musa A. Assessment of utilization of long acting reversible contraceptive and associated factors among women of reproductive age in Harar City, Ethiopia. *Pan Afr Med J* 2017; 28: 222.

25. Tilahun A, Yoseph A and Dangissso MH. Utilization and predictors of long acting reversible contraceptive methods among reproductive age women in Hawassa city, South Ethiopia: a community based mixed methods. *Contracept Reprod Med* 2020; 5: 9.

26. Wado YD, Gurmu E, Tilahun T, et al. Contextual influences on the choice of long-acting reversible and permanent contraception in Ethiopia: a multilevel analysis. *PLoS ONE* 2019; 14(1): e0209602.

27. 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.

28. Hibstu DT and Alemayehu A. Long acting reversible contraceptives utilization and associated factors among women of reproductive age in Arsi Negele town, Southeastern Ethiopia. *Contracept Reprod Med* 2020; 5: 6.

29. Gujo AB and Kare AP. Utilization of long-acting reversible contraceptives and associated factors among reproductive age women attending governmental health institutions for family planning services in Wondo Genet District, Sidama, National Regional State, Southern Ethiopia. *Health Serv Res Manag Epidemiol* 2021; 8: 1–7.

30. Alamdo AG, Debere MK and Tirfe ZM. Factors associated with non-utilization of long acting and permanent contraceptive methods among married women of reproductive age in Chencha District, Southern Ethiopia: a case-control study. *Pan Afr Med J* 2020; 35: 109.

31. Kebede B, Belete M, Negeri H, et al. Magnitude and factors affecting long-acting reversible contraceptive utilization among reproductive age women in Sili District, Southern Ethiopia. *J Women Health Care* 2020; 7(4): 494.

32. Zenebe CB, Adefris M, Yenit MK, et al. Factors associated with utilization of long-acting and permanent contraceptive methods among women who have decided not to have more children in Gondar city. *BMC Womens Health* 2017; 17: 75.

33. Alemayehu M, Kalayu A, Desta A, et al. Rural women are more likely to use long acting contraceptive in Tigray region, Northern Ethiopia: a comparative community-based cross sectional study. *BMC Womens Health* 2015; 15: 71.