Magnitude of Long-acting and Permanent Family Planning Practice and Its Factors Among Contraceptive Users: A Cross-sectional Study

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Research

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1 Magnitude of Long-acting and Permanent Family Planning Practice and Its Factors among
2 Contraceptive Users: A Cross-sectional Study

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22 Abstract

23 **Background:** Poor contraceptive utilization increases the risk of unintended pregnancies that
24 could results in complications and mortalities among women and children. To circumvent these
25 adverse health outcomes, long-acting and permanent contraceptive methods are the most
26 effective methods. This study explored the magnitude and associated factors of long-acting and
27 permanent family planning methods utilization among current family planning users largely on
28 the rural women of Ethiopia.

29 **Methods:** The study was a facility-based cross-sectional study design. The respondents were
30 randomly selected in Amhara region, Ethiopia. The data were entered into EPI-INFO version
31 7.0, cleaned, and analyzed in SPSS version 24. Descriptive statistics were done. Bivariate and
32 multivariable logistic regression models were used to identify the factors associated with the
33 utilization of long-acting and permanent family planning methods.

34 **Results:** The total numbers of respondents were 356. The prevalence of long-acting and
35 permanent family planning methods among current family planning users was 32.3%. The mean
36 age of participants was 30.1 ± 7.67 (SD) years. Almost all (94.4%) were Orthodox Christian
37 followers and most of the respondents (91.0%) married. Nearly half of the respondents (45.2%)
38 were illiterate and above half of the respondents (55.3%) were housewives. The odds of long-
39 acting and permanent family planning methods utilization were statistically significant among
40 women aged 25-34 years [AOR=5.10; 95% CI: (1.48, 17.59)], women who completed secondary
41 education [AOR=4.16; 95% CI: (1.32, 13.10)], women who had a positive attitude [AOR=3.05;
42 95% CI: (1.45, 6.43)], and women satisfied with facility care [AOR=2.08; 95% CI: (1.01, 4.31)].
43 Common reasons for low use of long-acting and permanent family planning methods were
44 preference for short-acting contraceptives, fear of side effects, and method misconception.

45 **Conclusion:** The utilization of long-acting and permanent family planning method was low.
46 Factors and common reasons for low utilization of long-acting and permanent family planning
47 methods among women who were current family planning users were identified. Therefore, we
48 suggest the need to provide continuous education and awareness creation towards long-acting
49 and permanent family planning methods. Unequivocally, enabling work environments, staff
50 service deliveries and client service satisfaction are paramount important improve the coverage.

Keywords: Prevalence, determinant factors, family planning use, reproductive age-group women, Yilmanadensa Woreda, West Gojam zone, Ethiopia

Plain English summary

Contraceptive is a birth controlling method that enables people to space or limit the number of children. It works to prevent maternal morbidity and mortality, fetal death, low birth weight, prematurity, and child death. Unintended pregnancies could result in complications and mortalities among women and children due to poor contraceptive utilization. The birth controlling methods are the most effective methods to avoid unintended pregnancies. This study showed that contraceptive methods coverage and associated factors in the rural setting of Ethiopia while studies that were done so far focused on urban areas. This study was conducted in selected health facilities. We selected four health facilities randomly in Yilmanadensa Woreda, Amhara region, Ethiopia. Respondents were selected during their health facility visit to gain birth control services in the selected health facilities. Among women who were current contraceptive users, only 32.3% were used long-acting and permanent contraceptive methods. Age, educational status, attitude towards long-acting and permanent contraceptive methods, and service satisfaction during health facility visit were factors that affect long-acting and permanent contraceptive methods utilization. Women who were in the medium age group, women who completed secondary education, women who had a positive attitude towards long-acting and permanent family planning methods, and women who were satisfied with the facility care services were the most users of long-acting and permanent contraceptive methods. Generally, this study indicated that the use of long-acting and permanent contraceptive methods was low among participated women in this study.

74 Introduction

75 Family planning enables people to space or limit the number of children. It works to prevent
76 maternal morbidity and mortality, fetal death, low birth weight, prematurity, and child death(1).

77 One most associated with lack of family planning utilization is a higher number of unintended
78 pregnancies occur due to a lack of family planning use. This may result in unsafe abortion and its
79 threatening consequences on the lives of women and babies(2).

80 To circumvent this and further adverse health outcomes among women and children, long-acting
81 and permanent family planning methods (LAPMs) are the most effective methods(3).

82 LAPMs include intrauterine contraceptive devices (IUDs), implants, female sterilization, and
83 vasectomy. The first two methods are long-acting reversible while the latter two are permanent
84 methods(4).

85 The magnitude of long-acting and permanent contraceptive methods utilization was higher than
86 50 percent in the world though it was low in Africa(5).

87 Despite the highest total fertility rate in Ethiopian(6), LAPMs coverage was considerably low
88 and resulted in high unintended pregnancy-related complications including death(7).

89 Unequivocally, LAPMs is a proven intervention to end complications and mortality. It also
90 reduced clients facility visit and contraceptive misuse(8).

91 Therefore, understanding the current magnitude and important risk, factors relevant to utilization
92 of LAPMs are certainly essential. Most importantly, this study informs the rural context of
93 Ethiopia which is barely reported so far. The evidence generated in this study is relevant to
94 design strategies and improve utilization of LAPMs.

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101 Methods and materials**102 Study design and setting**

103 We conducted a facility-based cross-sectional study design from September 2018 to June 2019.
104 The study area was-in Yilmanadensa Woreda, West Gojam Zone, Amhara Region, Ethiopia. The
105 study area covered a rural population where primary health care services are the largest of all.

106 Sample size and sampling procedure

107 All reproductive age group women who had a current health facility visit for family planning
108 service were included in the study. The sample size was 383 determined by single population
109 proportion formula. We assumed 34.7% proportion(9), 95% confidence level, 5% margin of
110 error, and 10% non-response rate. In the study district, there were eleven health centers and four
111 of them were selected by simple random sampling method. Women who had a family planning
112 visit in these selected four health centers were randomly chosen for an interview.

113 Study variables

114 Dependent variable: Long-acting and permanent family planning methods (LAPMs) use

115 Independent variables: age, education, religion, ethnicity, marital status, residence area,
116 occupation, income, number of children and future birth intention, awareness about long-acting
117 and permanent family planning methods, knowledge on the duration of LAPMs to prevent
118 pregnancy, knowledge about the advantage of LAPMs, knowledge about the disadvantage of
119 LAPMs, knowledge about types of LAPMs, fear of side effects, perceptions about LAPMs, fear
120 of infection, fear of infertility, perception about the privacy issue, perception about services
121 procedure, perception about waiting time, LAPMs misconception

122 Operational definitions

123 Utilization of LAPMs: reproductive-age women using at least one of the four long-acting and
124 permanent contraceptives, Intrauterine contraceptive devices, Implant, Vasectomy, Female
125 sterilization, during the study period(9).

126 Reproductive age women: women who were in the age group of 15-49 years and sexually
127 active(10).

128 Family planning user women: reproductive age-women who were using any contraceptive
129 methods including both modern and natural family planning methods during the study period(6).

130 Knowledge of LAPMs: assessed using 20 key questions; the knowledge of respondents on the
131 type of long-acting and permanent family planning methods, sources of information about
132 LAPMs, advantage, and disadvantage of LAPMs use, source of LAPMs, duration of IUD, and
133 implant to prevent pregnancy, aware of the return of fertility after removal of long-acting
134 reversible contraceptives, and the knowledge on whether it is permanent or reversible methods.
135 Then 20 questions were computed and labeled to good and poor knowledge based on the mean.
136 The mean score was determined after computing 20 knowledge assessing questions(9).

137 Good knowledge LAPMs: Women who scored above the mean of the correct answers for
138 questions set to assess the knowledge of respondents on LAPMs(11).

139 Poor knowledge of LAPMs: Women who scored below or equal to the mean score of the correct
140 answers from knowledge assessing questions of LAPMs(11).

141 Attitude towards LAPMs: assessed using 20 Likert scale questions; acceptance of LAPMs by
142 respondents, by religious institutions, and by the community, husband and family opinion,
143 consequences of LAPMs; infertility, uterus cancer, ectopic pregnancy, irregular bleeding of
144 menses, a decrease of sexual desire, infection, IUDs move out of the womb, interfere during
145 sexual intercourse, prevent doing heavy works, nulliparous women have to use intrauterine
146 contraceptive devices, insertion of intrauterine contraceptive devices loses privacy. Female
147 sterilization and vasectomy decrease sexual desires were other points addressed to assess attitude
148 to long-acting and permanent family planning methods. Then 20 questions were computed and
149 categorized into a positive attitude and a negative attitude based on the mean. The mean score
150 was determined after computing 20 attitude assessing questions(9).

151 Favorable Attitude towards LAPMs: Women who scored above the mean of the correct answers
152 for questions ready to measure the attitude of respondents towards LAPMs(11).

153 Unfavorable Attitude towards LAPMs: Women who scored less than or equal to the mean score
154 from attitude measuring LAPMs questions(11).

155 Service satisfaction: assessed using eight service satisfaction questions. The questions were how
156 were clients treated during their visit for family planning, how long clients did stay in health

facilities, what did clients feel about waiting time, whether health providers ask them if they had faced problems and they wanted to discuss the problems, did the health providers try to understand the problem and give suggestions what clients should do. In addition to these, clients' satisfaction with the treatments and advice during health facility visits for family planning service was the other question. Then 8 questions were computed and categorized into service satisfaction and service dissatisfaction based on the mean. The mean score was determined after computing eight service quality satisfaction assessing questions(9).

Service satisfaction: Women who scored above the mean of the correct answers for questions able to measure service satisfaction of respondents(11).

Service dissatisfaction: Women who scored less than or equal to the mean score from service satisfaction assessing questions(11).

Data processing and analysis

We used a pre-tested structured questionnaire to collect the data. Trained female diploma nurses collected the data supervised by a degree holder nurse. The data collection took place for 40 days from 21 February to 31 March 2019. The supervisor edited and cleaned the data daily. The data were entered into EPI-INFO version 7.0 and cleaned and analyzed in SPSS version 24. Descriptive statistics such as frequency, percentage, means, and standard deviations were done. Bivariate and multivariable logistic regression models were used to identify the factors associated with the utilization of LAPMs. Factors with a p-value of less than 0.25 in bivariate analysis were included in the multivariable logistic regression model to control confounders. The level of association was detected through adjusted odds ratios with a 95% confidence interval and a p-value of less than 0.05.

185 Results

186 Socio-demographic characteristics

187 A total of 356 respondents participated in the study with a 93% response rate. The study
 188 participants' mean age was 30.1($\pm$ 7.67 SD) years. Almost all participants (94.4%) were
 189 Orthodox Christian followers and most (91.0%) of them were married. Among the respondents,
 190 nearly half of them (45.2%) were illiterates, (55.3%) were housewives, and (54.8%) had less
 191 than 500 Ethiopian Birr monthly income (Table 1).

192 Table 1 Socio-demographic characteristics of respondents, Amhara Region, Ethiopia, 2019

Variables	Frequency	Percentage (%)
Age		
15—24	93	26.1
25—34	152	42.7
35—49	111	31.2
Religion		
Orthodox	336	94.4
Muslim	20	5.6
Marital status		
Married	324	91.0
Separated	22	6.2
Divorced	10	2.8
Educational status of respondents		
No formal education	161	45.2
Primary	61	17.1
Secondary	66	18.6
College and above	68	19.1
Husband educational status		
No formal education	106	32.7
Primary	60	18.5
Secondary	68	21.0
College and above	90	27.8

Occupational status of respondents

Housewife	197	55.3
Self employee	112	31.5
Government employee	47	13.2

Husband occupational status

Farmer	135	41.7
Self employee	111	34.2
Government employee	78	24.1

Monthly income (ETB) of respondents

≤ 500	195	54.8
501-1000	53	14.9
>1000	108	30.3

Husband monthly income (ETB)

≤ 500	57	17.6
501-1000	60	18.5
>1000	207	63.9

Total monthly income (ETB) of the family

≤ 500	38	10.7
501-1000	54	15.2
>1000	264	74.1

Number of family size

< 5	241	67.7
≥ 5	115	32.3

Residence environment

Rural	241	67.7
Urban	115	32.3

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196 Respondent's obstetrics characteristics

197 More than three-fourths of the respondents (77.5%) had ever been pregnant. Of these, (95.3%)
 198 had given birth. Age at first marriage ranged 4 to 27 years and the mean age of the first marriage
 199 was 16.29 ± 4.49 (SD) years. The mean age of first pregnancy was 20.06 ± 3.02 (SD) years and
 200 ranged between 14 and 30 years. Age at first delivery ranged from 14 to 31 years old and the
 201 mean age was 20.87 ± 3.01 (SD) years. The mean number of children was 2.46 ranged from 2.29
 202 to 2.63, and most of the respondents (82%) had future birth intension (Table 2).

203 Table 2 Respondents obstetrics characteristics, Amhara Region, Ethiopia, 2019

Variables	Frequency	Percentage (%)
Age at the time of first marriage		
≤ 14	106	31.0
15-19	144	42.1
20-24	82	24.0
≥ 25	10	2.9
Age at the time of first pregnancy		
≤ 19	118	42.8
20-24	135	48.9
≥ 25	23	8.3
Age at the time of first birth		
≤ 19	82	31.2
20-24	150	57.0
≥ 25	31	11.8
Number of live children		
< 3	97	37.5
≥ 3	162	62.5
Future birth intention		
Yes	292	82.0
No	64	18.0

205 Respondents LAPMs Knowledge

206 The majority (84%) of the study participants ever heard about LAPMs and three-fourths (75%)
 207 of them knew at least one of the LAPMs. Implant was the commonly known one (98.9%).
 208 Among women who knew LAPMs, 68.2% of them understood LAPMs uses for child spacing.
 209 Greater than half of the respondents (57.7%) knew that LAPMs had bad health effects. Almost
 210 all (91.8%) of them knew that LAPMs were adequately available in their area and 92.1% knew
 211 that LAPMs were free of charge. Most of the respondents (91.4%) knew implant is reversible
 212 while 33% of them knew that intrauterine contraceptive device (IUD) is also reversible (Table
 213 3).

214 Table 3 Respondents knowledge about LAPMs, Amhara Region, Ethiopia, 2019

Variable	Frequency	Percentage (%)
Ever heard about LAPMs	299	84.0
Source of information		
Health extension	217	72.6
Health service provider	155	51.8
Friend	112	37.5
Neighbor	102	34.1
Media	98	32.8
Types of LAPMs the respondents know		
IUD	103	38.6
Implant	264	98.9
Female sterilization	29	10.9
Vasectomy	22	8.2
Advantage of LAPMs		
Child spacing	182	68.2
Prevent unwanted pregnancy	157	58.8
Limit family size	129	48.3
Prevent maternal and child death	52	19.5
Prevent abortion	49	18.4
Disadvantage of LAPMs		

Health side effect	154	57.7
Infertility	49	18.4
Infection	66	24.7
Cancer	21	7.9
Source of LAPMs		
Government health center	207	84.5
Health post	140	57.1
Government hospital	119	48.6
Private pharmacy	43	17.6
Private clinics	26	10.6
Duration of IUD to prevent pregnancy		
< 3 years	28	10.5
3-5 years	38	14.2
5 -10 years	102	38.2
10- 12 years	68	25.5
> 12 years	31	11.6
Duration of an implant to prevent pregnancy		
< 1year	28	10.5
1- 3 years	51	19.1
3- 5 years	179	67.0
> 5 years	9	3.4
Knowledge of LAPMs		
Good	106	43.4
Poor	138	56.6

The study showed that all respondents had ever heard at least one family planning method (Figure 1).

Fig 1 Types of family planning methods respondent ever heard, Amhara Region, Ethiopia, 2019

Attitude and service quality perception towards LAPMs

The study showed (68.5%) of respondents accepted LAPMs and (9.3%) were not sure to accept the LAPMs. Nearly one-fourth of the respondents (22.2%) did not accept LAPMs, and (23.3%) of them believed that LAPMs decrease the sexual desire of users while more than half (54.8%) of respondents, perceived insertion of intrauterine contraceptive devices lose privacy. On the other hand, a quarter (22.5%) of respondents believed that female sterilization decreases the sexual desire of users. Some of the total respondents (18.3%) faced poor treatment in health facilities during family planning service, and (19.1%) of them faced too long waiting times (Table 4).

228 Table 4 Respondent's attitude and service quality perception towards LAPMs, Amhara Region,
229 Ethiopia, 2019

Variables	Frequency	Percentage (%)
Attitude about LAPMs (356)		
Positive attitude	181	50.8
Negative attitude	175	49.2
Satisfaction of treatment		
Satisfied	195	54.8
Unsatisfied	161	45.2
LAPMS are acceptable by religious institutions		
Strongly agree	9	2.5
Agree	22	6.2
Not sure	38	10.7
Disagree	133	37.3
Strongly disagree	154	43.3
Husbands had a positive attitude to LAPMS		
Strongly agree	45	12.7
Agree	120	33.7
Not sure	63	17.7
Disagree	83	23.3
Strongly disagree	45	12.6
Families had a positive attitude towards LAPMS		
Strongly agree	50	14.0
Agree	106	29.8
Not sure	51	14.3
Disagree	108	30.4
Strongly disagree	41	11.5
LARCs does not cause infertility		
Strongly agree	33	9.3
Agree	117	32.9
Not sure	146	41.1

Disagree	40	11.2
Strongly disagree	20	5.6
LAPMs does not cause uterus cancer		
Strongly agree	42	11.8
Agree	115	32.3
Not sure	131	36.8
Disagree	48	13.8
Strongly disagree	20	5.6
LAPMs does not cause ectopic pregnancy		
Strongly agree	37	10.4
Agree	78	21.9
Not sure	180	50.6
Disagree	46	12.9
Strongly disagree	15	4.2
LAPMs does not cause irregular bleeding		
Strongly agree	16	4.5
Agree	54	15.2
Not sure	55	15.4
Disagree	141	39.6
Strongly disagree	90	25.3
LAPMs does not decrease sexual desire		
Strongly agree	34	9.6
Agree	98	27.5
Not sure	141	39.6
Disagree	63	17.7
Strongly disagree	20	5.6
LAPMs does not cause infection		
Strongly agree	33	9.0
Agree	73	20.2
Not sure	146	41.0
Disagree	72	20.5

Strongly disagree	32	9.3
IUD do not move out of the womb		
Strongly agree	33	9.3
Agree	85	23.9
Not sure	184	51.7
Disagree	34	9.6
Strongly disagree	20	5.6
IUD insertion do not lose privacy		
Strongly agree	44	12.4
Agree	51	14.3
Not sure	66	18.5
Disagree	89	25.0
Strongly disagree	106	29.8
Female sterilization does not decrease sexual desire		
Strongly agree	35	9.8
Agree	90	25.3
Not sure	151	42.4
Disagree	54	15.2
Strongly disagree	26	7.3
Vasectomy does not make the penis impotence		
Strongly agree	33	9.3
Agree	76	21.3
Not sure	189	53.1
Disagree	44	12.4
Strongly disagree	14	3.9

230 Long-acting and permanent contraceptive methods utilization

231 Among the respondents, 43.3% had ever used LAPMs. Almost all (94.8%) of them had ever
 232 used an implant. On the other hand, a small number of respondents 7.1% and 2% had ever used

IUD and female sterilization respectively. The mean respondent age to start LAPMs was 24.99±5.44 years.

The prevalence of LAPMs was 32.3% [95% CI; (27.5, 37.1)], implying only one-third of respondents were current users of LAPMs. Most of the respondents (90.4%) used implant. Some of them (7%) were using IUD and only (2.6%) women were using female sterilization (Figure 2).

Percentage

Fig 2 Respondents' current use of LAPMs, Amhara Region, Ethiopia, 2019

The main reasons for LAPMs utilization were the benefit of LAPMs over other contraceptives, child spacing, and advice from health professionals. On the other hand, the barriers to use LAPMs were preference for short-acting contraceptives, fear of side effects, and method misconception.

Among respondents who were using LAPMs, 37.0% of women had faced health problems due to the utilization of LAPMs (Figure 3).

Health side effect of LAPMs

Fig 3 Reported health side effects of LAPMs among respondents who were on LAPMs, Amhara Region, Ethiopia, 2019

Factors associated with LAPMs utilization

Age, education, attitude, and service satisfaction had statistically a significant association with LAPMs utilization. The odds of LAPMs utilization among women aged 25-34 years were five times higher compared to 15-24 years age group [AOR=5.10; 95% CI: (1.48, 17.59)]. The odds of LAPMs among women who completed secondary education were four times greater than women who had no formal education [AOR=4.16; 95% CI: (1.32, 13.10)]. The odds of LAPMs among women who had a positive attitude were three times greater than women who had a negative attitude [AOR=3.05; 95% CI: (1.45, 6.43)], and the odds of LAPMs among women who satisfied with facility care were two times higher compared to their dissatisfied counterparts [AOR=2.08; 95% CI: (1.01, 4.31)] (Table 5).

261 Table 5 Factors associated with LAPMs, Amhara Region, Ethiopia, 2019

Determinant variables	LAPMs utilization		COR (95% CI)	AOR (95% CI)
	Yes	No		
Age				
15-24	16	77	1	1
25-34	62	90	3.32 (1.77, 6.21)*	5.10 (1.48, 17.59)**
35-49	37	74	2.41 (1.23, 4.69)*	2.82 (0.74, 10.77)
Education				
No formal education	34	127	1	1
Primary	17	44	1.44 (0.73, 2.84)	1.97 (0.69, 5.63)
Secondary	33	33	3.74 (2.02, 6.90) *	4.16 (1.32, 13.10)**
College and above	31	37	3.13 (1.70, 5.75) *	1.17 (0.35, 3.88)
Attitude of LAPMs				
Positive	90	91	5.93 (3.55, 9.92) *	3.05 (1.45, 6.43)**
Negative	25	150	1	1
Service satisfaction				
Satisfied	75	120	1.89 (1.19, 2.99)*	2.08 (1.01, 4.31)**
Dissatisfied	40	121	1	1
Number of live children				
≥ 3	61	101	1.57 (0.91, 2.70)	1.92 (0.80, 4.62)
< 3	27	70	1	1
Knowledge of LAPMs				
Good	53	53	1.38 (0.83, 2.3)	1.49 (0.71, 3.11)
Poor	58	80	1	1
Residence				
Urban	47	68	1.76 (1.10, 2.80) *	0.86 (0.37, 2.01)
Rural	68	173	1	1
Monthly income				
≤ 500 ETB	58	137	1	1
501- 1000 ETB	13	40	0.77 (0.38, 1.54)	0.88 (0.31, 2.52)
> 1000 ETB	44	64	1.62 (0.99, 2.66)	1.11 (0.41, 3.01)

Future birth intention

No	16	48	0.65 (0.35, 1.20)	1.03 (0.40, 2.66)
Yes	99	193	1	1

**Age group of 25-34 ($p = 0.01$), secondary education ($p = 0.015$), positive attitude ($p = 0.003$) and satisfied with the service ($p = 0.049$)

Discussion

The study found a low proportion (32.3%) of LAPMs utilization. The finding concurs with other studies in Ethiopia(9, 12, 13). The study settings and design could contribute to the consistency of the findings.

However, it was significantly lower than the finding from Gambia(14). The study in Gambia was conducted in a single facility and had a smaller sample. Also unlike our study, Depo-Provera was considered as LAPMs in Gambia's study upsurge the magnitude. Likewise, there are also other studies in Ethiopia(4, 8, 15, 16, 17) that are contrary to our finding. We assumed study time and setting as well as sampling methods and sample size contributed to the difference.

Majority of the respondents had awareness about LAPMs unlike studies reported in Mekelle town(18), Debre-Markos town(19), Arbaminch town(8) and Goba town(20) of Ethiopia. We anticipated that source of information took the possible reason for the variation as the study settings varied.

Government health facilities were the main LAPMs providers in this study similar to other studies in Ethiopia(4,17, 18). The methodology and study settings were similar to our study that could be the possible reason of similarity.

Implant was commonly used contraceptive followed by IUD and female sterilization in this study. Other studies in Ethiopia also showed a similar result(9, 12, 13, 17, 18). We assumed the sample size and study design had a contribution to the sameness of the findings.

The main barriers of LAPMs utilization were the tendency of short-acting contraceptives over LAPMs, fear of side effects, and method misconception which was similar to a study conducted in Debre-Berhan(11). We assumed that the sampling technique contributed to the consistency.

The odds of LAPMs utilization among women in the age group of 25-34 years were five times higher as compared to 15-24 years of age [AOR=5.10; 95% CI: (1.48, 17.59)]. Correspondingly, a similar finding was reported in Jinka town(4). The study design and setting could have a role of similarity of the findings. But, another study in Addis Ababa reported the opposite(21). We anticipated that the study setting took the reason of inconsistency as younger women who live in Addis Ababa could have more information than their counterparts in a rural community.

The odds of LAPMs utilization among women who completed secondary education were four times higher than women who had no formal education [AOR=4.16; 95% CI: (1.32, 13.10)]. Similar findings were reported in Gondar city(9), Bati town(12), and Nekemte town(22). The sample size could have a contribution to the consistency. On the other hands, few studies in Jinka town(4), Adigrat town(10), and Addis Ababa(21) in Ethiopia reported dissimilar findings. We assumed the study period, study settings, and sampling technique may cause discrepancies.

The odds of LAPMs utilization among women who had a positive attitude towards LAPMs were three times higher compared to women who had a negative attitude [AOR=3.05; 95% CI: (1.45, 6.43)]. Findings in Debre-Berhan(11) and Bati town(12) were consistent with this result. We assumed that the study settings may input to similarity of the findings.

The odds of LAPMs utilization among women who were satisfied with treatment during their visit to health facilities were twice higher than dissatisfied women [AOR=2.08; 95% CI: (1.01, 4.31)]. It was similar to a finding in Debre-Berhan, Ethiopia(11). We assumed that the study setting may have a role in the consistency of the findings.

Conclusion

Long-acting and permanent family planning methods utilization was low. Age, educational status, attitude towards LAPMs, and service satisfaction were statistically significantly associated with LAPMs utilization. Also, common barriers reported for LAPMs utilization were the type of contraceptive preference, fear of side effects, and method misconception.

Abbreviations

EDHS: Ethiopian Demographic and Health Survey, FP: Family Planning, HC: Health Center, IUD: Intrauterine Contraceptive Device, LAPMs: Long-acting and Permanent Contraceptive Methods, ETB: Ethiopian Birr

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from the Ethical Review Committee of the School of Public Health, Addis Ababa University. Permission letters were obtained from each administrative body and health facilities. Study participants were informed about the study objective and the right not

338 to take part or withdraw participation before the interview started or at any time during the
339 interview. For all respondents, written consent was secured, and the respondent's information
340 was completely confidential.

341 **Consent for publication**

342 Not applicable

343 **Availability of data and materials**

344 The dataset for this study is available from the correspondent author and can be provided on a
345 reasonable request.

346 **Competing interests**

347 The authors declared that they have no competing interests.

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350 **Authors' contributions**

351 AAW conceived the study, designed the study, developed the tool, coordinated data collection,
352 performed the statistical analysis, interpreted the findings and drafted the manuscript.

353 NAK designed the study, developed the tool, performed the statistical analysis interpreted the
354 findings, guided the project, and drafted the manuscript. All authors read and approved the
355 manuscript.

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Figures

Figure 1

Types of family planning methods respondent ever heard, Amhara Region, Ethiopia, 2019

Figure 2

Respondents' current use of LAPMs, Amhara Region, Ethiopia, 2019

Figure 3

Reported health side effects of LAPMs among respondents who were on LAPMs, Amhara Region, Ethiopia, 2019