

Factors Influencing Discontinuation of Long-Acting Reversible Contraceptive Methods Among Women in Bahir Dar City, Northwest Ethiopia: A Cross-Sectional Study

Yilkal Dagnaw Melesse¹, Selamawit Lake Fenta², Toyiba Hiyaru Wassie², Alemwork Abie Getu², Seid Wodajo Liben³, Zelalem Feleke Wudu³, Ambaye Minayehu Zegeye³, Mastewal Yechale Mulu¹, Getahun Deguale Kebede³, Tewodros Worku Bogale⁴

AFFILIATIONS

1 Department of Midwifery, College of Medicine and Health Sciences, Debre Markos University, Debre Markos, Ethiopia

2 Department of Midwifery, College of Medicine and Health Sciences, Bahir Dar University, Bahir Dar, Ethiopia

3 Department of Midwifery, College of Health Sciences, Assosa University, Assosa, Ethiopia

4 Department of Midwifery, College of Health Sciences, Injibara University, Injibara, Ethiopia

CORRESPONDENCE TO

Yilkal Dagnaw Melesse. Department of Midwifery, College of Medicine and Health Sciences, Debre Markos University, Debre Markos, Ethiopia.

E-mail: yilkal_dagnaw@dmu.edu.et

KEYWORDS

discontinuation, reversible long-acting contraceptives, factors, Bahir Dar, Ethiopia

SUBMITTED: 1 July 2024, **REVISED:** 21 July 2024, **DECISION:** 24 July 2024

ABSTRACT

INTRODUCTION: Long-acting reversible contraceptive discontinuation is the removal before completion of the intended lifespan of the method. Despite the improvement in utilization, discontinuation is becoming high. There is no study conducted on discontinuation and associated factors of long-acting reversible contraceptives in Bahir Dar City. The aim of this study was to assess the proportion and associated factors of discontinuation of Long-Acting Reversible Contraceptives among women in health facilities of Bahir Dar city, Northwest Ethiopia.

METHODS: A health facility-based cross-sectional design was conducted on 415 respondents from April 1 to May 30, 2021. A total of 11 health facilities were included and all reproductive age women who were using Long-acting reversible contraceptives came to the selected health facilities for any issue concerning the method before completion of life span of the method were included in this study. Data were collected through face-to-face interview questionnaires using a systematic random sampling method. Epi Data version 3.1 and Statistical Package for Social Sciences were used for data entry and analysis, respectively. Logistic regression analyses were used, and a P value less than 0.05 was considered a statistically significant factor for discontinuation.

RESULTS: The overall proportion of discontinuation of long-acting reversible contraceptives was 66.3% (95% CI: 61.42-69.13). No formal education (AOR=0.49; 95% CI: 0.30-0.82, P: 0.021), primary education (AOR=0.39; 95% CI: 0.18-0.81, P: 0.012), wish to pregnancy (AOR=2.57; 95% CI: 1.64 to 4.02, P: <0.001), no history of contraceptive use (AOR=2.01; 95% CI: 1.19 to 3.38, P: 0.009), no counselling (AOR=1.68; 95% CI: 1.08-2.62, P: 0.021), and side effects (AOR=1.95; 95% CI: 1.21-3.16, P: 0.006) were the factors associated with discontinuation.

CONCLUSION: The overall discontinuation of long-acting reversible contraceptives among women was low compared to Ethiopian Demographic Health Survey 2016. Practice pre-insertion counselling, early side effect management, create community awareness about the methods to decrease discontinuation, healthcare providers should perform their duties in line with the standards and quality of Long-acting reversible contraceptive service provision through qualitative research are recommended.

INTRODUCTION

Discontinuation of Long-acting reversible contraceptive is cessation or switch to other methods for any reason before completion of the intended lifespan of the Long-acting reversible contraceptives (LARC), a designated period during which it is highly effective.¹ Intrauterine contraceptive devices (IUCD) and implants are known as long-acting reversible contraceptives (LARCs). They represent highly effective methods of modern birth control and their duration of action is long ranging from 3 to 10 years (Espey & Ogburn, 2011).² One of the fundamental practices of women's health care is the provision of effective contraception like LARCs; the annual pregnancy rates for Intrauterine Contraceptive Devices (IUCDs) are less than 1 per 100

women and the clinical failure rate of Implant is less than 1%.³

Intrauterine Contraceptive Devices are T-shaped bearing copper or levonorgestrel-releasing that must be placed in the uterus by a trained health professional. Implants are progestin-containing rods that are inserted under the skin of the inner arm and can prevent pregnancy for three to five years. Intrauterine Contraceptive Devices are the most cost-effective and efficient methods in preventing pregnancy for up to 10 years.⁴

Decreasing discontinuation of LARCs is an excellent strategy to avoid or at least reduce unwanted pregnancy (UP). The effectiveness of LARCs is higher than other methods and is indeed comparable to that of permanent contraception.⁵ Discontinuation of LARCs contributes to unplanned pregnancies which expose a risk to the health of women, affects the family size, and contributes to higher fertility rate, social, economic and physical health problems.⁶ Although there is an improvement in long-acting reversible contraception usage, discontinuation is becoming a major problem. Nevertheless, Ethiopia developed a plan to expand LARCs by providing Implanon (a contraceptive implant effective for up to its 3 years) at the community level since 2009, still low utilization and a high number of premature discontinuations were reported.⁷

Discontinuation of LARCs was high in Ethiopia in which 45% of IUCD and 61% of implants were discontinued by three years of utilization. The high LARCs discontinuation is coupled with low uptake; is big challenge to achieve the targeted prevalence rate in the country and among the associated factors of discontinuation, didn't receive pre-insertion counseling, experienced side effects, and desire for pregnancy were mentioned.⁸

Long-acting reversible contraceptives can prevent thousands of cases of maternal mortality by preventing annually occurring 87 million unintended pregnancies.⁹ Discontinuation of LARCs is higher in third world countries than developed world; in Myanmar, LARCs discontinuation is 7% for intrauterine contraceptive devices, 0.2% for implants, and 28% of women shifted to other modern contraceptives (Tin, Maung, & Win, 2020).¹⁰ The use of modern contraceptives in the 69 Family Planning (FP) 2020 initiative targeted countries prevented around 84 million unwanted pregnancies, 26 million unsafe induced abortions, and 125,000 deaths in women.¹¹ The delivery of FP services especially LARCs is an important strategy for reducing maternal morbidity and mortality. Multicounty studies have shown that family planning can reduce maternal deaths by as much as 40 percent.¹² World health organizations and national governments had started promoting LARCs as a strategy to implement family planning programs.¹³

An estimated 214 million women have missed opportunities for family planning in third-world countries.¹⁴ About half of women will discontinue their contraceptive methods especially in the first year of utilization and

investigations on discontinuation showed important clinical and public health insights, although few of them have identified associated factors for the discontinuation.¹⁵ Despite increases in availability, effectiveness and knowledge on LARCs in Ethiopia, the overall utilization of LARCs is very low and there is high discontinuation including Amhara region.¹⁶

There is limited study conducted in Ethiopia on this topic since there is only one study conducted at Hawasa City Southern Ethiopia. There is no study conducted on the proportion and associated factors of Long-acting reversible contraceptives in Bahir Dar city. Therefore, this study was aimed to assess the proportion and factors associated with discontinuation of long-acting reversible contraceptives among user reproductive-age women in Bahir Dar City health facilities which can be used to direct health professionals to improve counseling service provision, the ability of planning and decision-making to look at possible solutions regarding LARCs. This may also insist health professionals to solve the problems themselves as well as in collaboration with concerned stakeholders concerning the proportion of discontinuation of LARCs and associated factors.

Conceptual framework

The detailed factors or variables for discontinuation of LARCs are mentioned below in the section of conceptual framework.

METHODS AND MATERIALS

Study design and setting

Institution-based cross-sectional study design was conducted in Bahir Dar city health facilities from April 1 to May 30 /2021.

All public health facilities of Bahir Dar city (3 hospitals and 6 health centers) which have LARC services were included in the study. Two Nongovernmental specialty clinics (Family Guidance Association and Maire stops) were also included since they provide LARCs service. The other private health facilities were not included since they have no full LARC services (insertion and removal). Hence a total of eleven (11) health facilities were included in this study.

The study was conducted in the health facilities of Bahir Dar City which provide Family Planning services including LARCs. Bahir Dar is the capital city of Amhara National Regional State in the Federal Democratic Republic of Ethiopia located in the Northwest direction at 565 km away from Addis Ababa, the capital city of Ethiopia.¹⁷ The population of Bahir Dar City was estimated to be 389,177 in the year 2020 based on the 2007 census.¹⁸

The Bahir Dar city has one specialized referral, one comprehensive referral, and one primary public hospital (Tibebe Ghion, Felege Hiwot, and Addis Alem respectively), 6 health centers (Abay health center (AHC), Han health center (HHC), Shimbet health center (SHC), Menelik health center (MHC), Bahir Dar health center (BHC) and Shum-abo health center (SAHC), 10 health posts, two specialized clinics (family

guidance association and Maire stope), 4 private general hospitals and 35 medium private clinics.¹⁹

All the above-mentioned health centers, hospitals, and the two special clinics provide services in different departments (OPD, Emergency, Pharmacy, laboratory, and MCH which includes Family planning). Hospitals broadly provide their services in four major categories (medical, surgical, obstetrics, and gynecology) as outpatient and inpatient services. These health facilities provide long-acting reversible contraceptive methods (insertion and removal).

Family guidance association and Maire stop specialized clinics are non-governmental facilities that provide consistent family planning services including implants and Intrauterine contraceptive devices. Therefore, these were included in this study. There are at least two trained health professionals on LARC insertion and removal in each selected facility. The other private health facilities were not included as a study area since there is no provision of full services of LARCs.

PARTICIPANTS

Eligibility Criteria

Inclusion criteria: All reproductive age women who were using LARCs came to the selected health facilities for any

issue concerning the method before completion of the life span of the LARCs; like removal, side effects, and follow-up during the actual data collection period.

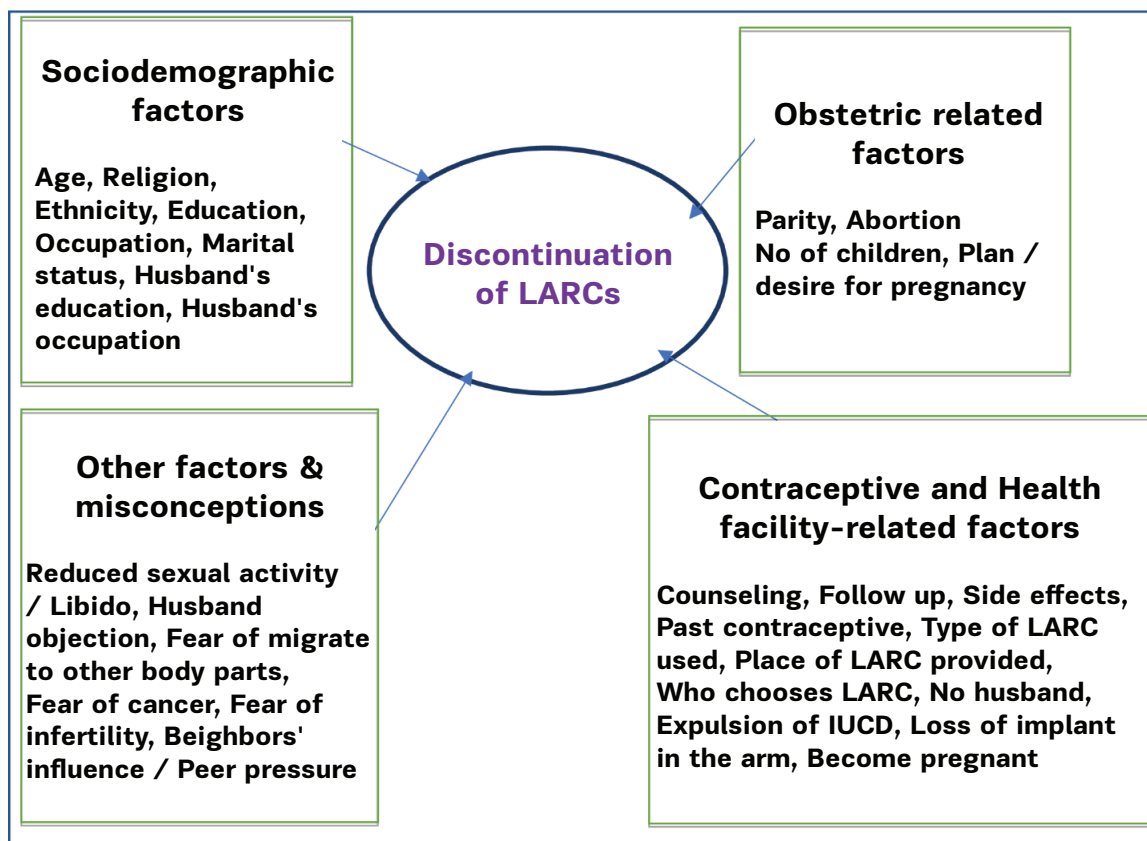
Exclusion criteria: all women who were using LARCs came to the selected health facilities for the removal of LARCs who got the service outside Bahir Dar city and who came to change Implanon to Jaddles, Jaddles to Implanon and implants to IUCD or vice versa.

Sample size determination: accordingly, for the first and second specific objectives, the sample size was calculated separately, and the larger sample size was taken to be used for this study. Sample size determination for objective one was calculated by using single population formula by considering the following assumptions: 95% CI, the prevalence (P) of LARC discontinuation taken from a study conducted in Hawassa city which was 57% with a non-response rate of 10%.¹

$$N = z\left(\frac{\alpha}{2}\right)^2 \left(\frac{p(1-p)}{d^2}\right)$$

Where **n** is the minimum sample size required, **p** is expected proportion of discontinued LARCS, **z**=1.96 (95% CI) and **d**= 0.05 is the margin of error between the sample and the population. Applying the equation; $n = (1.96)^2 \frac{0.57 \cdot 0.43}{(0.05)^2} = 377$, with 10% non-response rate the final sample was calculated as $377 + (377 \cdot 10/100) = 377 + 37.8 = 377 + 38 = 415$.

Figure 1: Conceptual framework for factors associated with LARCs adapted from previous pieces of literature Bahirdar,2021(1)



Sample size determination for objective two was calculated by using double population formula with Epi-info version 7.2.1 Stat Calc by considering the following assumptions: Two-sided significant level (1 - alpha): 95% CI, power (1 - beta, % chance of detecting): 80%, the ratio of Exposed: Unexposed =1, and nonresponse rate of 10%. Exposed in this case means exposed to factors for removal (experiencing side effects, lack of counseling, and desire for pregnancy). These factors were taken from a study conducted in in Hawassa City.¹ Finally, the calculated sample size for the second objective with 10% nonresponse rate is less than that of the first objective. Therefore, the sample size of the first objective was the sample size of this study which is **415**.

The study participants were identified using data from the family planning registration book. Information from two-month reports over the year preceding the study period indicated that 830 women had booked appointments or used long-acting reversible contraceptives (LARCs) at health facilities in Bahir Dar City during similar months. The average two-month client flow was calculated for each facility. The proportionate sample size for each facility was calculated using the formula:

$$n_i = (N_i * n^f) / N$$

where:

n_i = sample size for each facility,

N_i = number of women using LARCs at each facility within two months,

n^f = total study sample size (415),

N = total number of women using LARCs in Bahir Dar City health facilities (830).

The total sample was then obtained through a systematic sampling technique based on the daily caseload. The sampling interval, K , was calculated as $830 / 415 = 2$; this interval means that every second eligible participant would be included in the sample. ^{Figure 2}

Source population: all reproductive-age women who were

using long-acting reversible contraceptive methods in health facilities of Bahir Dar city.

Study population: all reproductive-age women who were using long-acting reversible contraceptive methods came to selected health facilities of Bahir Dar city with contraceptive-related issues during the study period.

Data Sources and Measurement

The data for this study were collected by using a pre-tested structured interview-based questionnaire which was adapted from previous literature ¹ with some modifications. There are four main parts in this questionnaire. These are socio-demographic characteristics, obstetric-related factors, contraceptive method and health facility-related factors, and others factors including myths and misperceptions about LARCS. To check for its consistency, the questionnaire was first developed in English and translated into Amharic and then finally back to English.

Well-designed data collection tools were used. Data collectors and supervisors were trained in data collection for one day. The questionnaire was tested on 5% of the total sample size (21 women) using the implant methods at Zenzelima Health Center (11 women) and Meshenti Health Center (10 women) to check the contextuality of the data. The questionnaire was revised and amended as necessary after the pretest was completed and double data entry was performed.

Data collectors were five Nurses (3 diploma and 2 degree) and six Midwives (2 diploma and 4 degree) who were not working in health facilities. Data were collected from study subjects through a face-to-face interview-guided questionnaire. Data were collected and the questionnaire was filled by data collectors after obtaining written consent from the study participants.

Data collectors have gathered information from study subjects around the family planning room after completion of the service provided by health care providers. Three supervisors with a qualification of degree and skilled in

Table 1: Sample size determination using associated factors of discontinuation of reversible long-acting contraceptive methods among women in Bahir Dar city Health facilities, Northwest Ethiopia, 2021.

S. no	Factors	Reference	AOR	Power	CI	Ratio	% Of Un-Exposed outcome	% Of Expo-sed outcome	Sample size with 10 % non-response rate
1	Removal due to experience of side effects	1	2.09	80	95%	1	47.2	35.3	286
2	Removal due to lack of counseling	1	2.49	80	95%	1	25.8	44.8	207
3	Removal due to desire for pregnancy	1	2.34	80	95%	1	56	36.4	240

data collection supervised the data collection. The principal investigator supervised and provided all necessary items for data collection, checked completeness and logical consistency, and solve problems during the time of data collection daily.

Variables

Dependent variable

Long-acting reversible contraceptives discontinuation (Yes/No).

Independent variables

Socio-demographic characteristics: Age, marital status, religion, ethnicity, occupation, maternal educational status, husband’s educational status, and husband’s occupation.

Obstetric related factors: Parity, number of living children, history of abortion, and desire for pregnancy in near future.

Contraceptive method and health facility-related factors: Past contraceptive utilization, type of LARC used, side effects, follow-up, type of health facility, counseling, who choose LARC, has no husband/go abroad, loss of implant in the arm, the expulsion of IUCD/missing of string, and becoming pregnant/method failure.

Other factors including Myths and Misconceptions: Peer pressure/neighbor’s influence, husband objection/order, decreasing of sexual activity/Libido, fear of migration of the LARC to other body parts, fear of infertility, and fear of cancer.

Operational definitions

Long-acting reversible contraceptive methods (LARCs): contraceptive methods which serve as 3–10 years but can be removed at any time (not permanent); only implants and IUCD.¹⁹

Discontinuation of LARCs: starting using and cessation of long-acting reversible contraceptives before completion of duration due to any issue concerning with the method.¹

Side effect: when the women develop at least one of the following after LARC insertion: menstrual disruption, insertion site pain, difficulty to work, headache, acne and weight change.^{17&20}

Misconception: without scientific evidence, the woman perceived LARCS can cause infertility, cancer, shifting to other body sites, and reduce sexual activity.²¹

Implanon: is a type of long-acting reversible contraceptive (LARC) in the form of a small, flexible rod inserted under the skin of a woman’s upper arm. It contains the hormone etonogestrel, which is released slowly to prevent pregnancy

Jaddles: implants, containing the hormone levonorgestrel, are a long-term, reversible contraceptive method used to prevent pregnancy for up to five years.

Statistical analysis

After data collection, the questionnaire was checked for completeness, and the data were entered, coded, checked, and cleared by using EPI DATA V-3.1 and exported to SPSS V-25 computer software. Then descriptive statistics to summarize the data (quantitative variables were presented as

Figure 2: Schematic presentation of sampling the procedure for discontinuation of reversible long-acting contraceptives and associated factors, Bahir Dar city, 2021

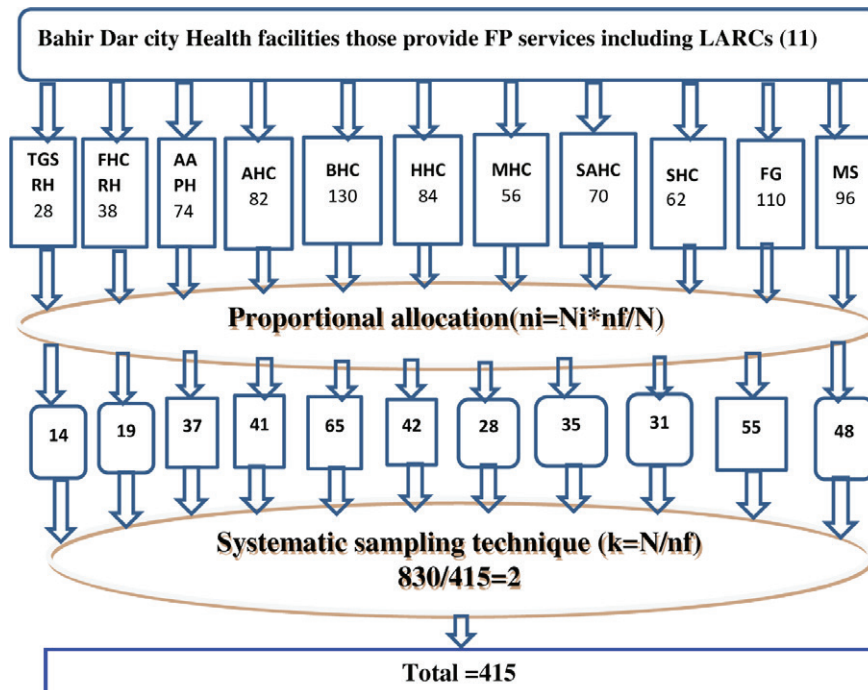


Table 2: Sociodemographic characteristics of long-acting reversible contraceptive users in health facilities of Bahir Dar city, Northwest Ethiopia, 2021(n=415)

Variables	Categories	Frequency	Percentage
Age	<20	12	2.9
	20-24	84	20.3
	25-29	106	25.5
	30-34	102	24.6
	>35	111	26.7
Marital status	Married	294	70.8
	Single	59	14.3
	Divorced	32	7.7
	Widowed	30	7.2
Religion	Orthodox	304	73.3
	Muslim	82	19.8
	Protestant	17	4.1
	Others©	12	2.8
Ethnicity	Amhara	387	93.3
	Agew	18	4.3
	Oromo	10	2.4
Educational level	Unable to read & write	66	15.9
	Read & write	76	18.3
	Primary	59	14.2
	Secondary	109	26.3
	College & above	105	25.3
Maternal occupation	Housewife	172	41.4
	Merchant	61	14.7
	Private employee	45	10.8
	Student	59	14.3
	Government employee	78	18.8
Husband's occupation	Unable to read & write	30	10.2
	Read & write	41	14.0
	Primary	44	15.0
	Secondary	73	24.8
	College& above	106	36.0
	Government employee	66	22.4
	Private employee	54	18.4
	Merchant	104	35.4
	Farmer	39	13.3
	Student	18	6.1
Others©©	13	4.4	

©=catholic & Adventist, ©©=labor, self-employer

means, standard deviations), and bivariate logistic regression were performed at the 95% confidence level with LARCs discontinuation for each factor. Variables at $p < 0.25$ were entered into multivariate logistic regression analysis with a 95% confidence level. Multivariate logistic regression was used to control for potential confounders. Missing data were addressed by using imputation. The variables with p values less than 0.05 were considered statistically significant factors for LARCs discontinuation.

Ethical Considerations

The study gets research ethics approval from Bahir Dar University, College of Medicine and Health Sciences Institutional Review Board (IRB) on March 29,2021 with Protocol Version Number 02. The permission and agreement consent were obtained from Bahir Dar city Health Department and the selected health facilities prior to data collection. Informed, written, and signed consent was obtained from the heads of health facilities. Finally, informed consent was obtained from the participants. The participants were also assured that their responses could not result in any harm and were offered full rights not to participate, and confidentiality was maintained.

RESULTS

Sociodemographic characteristics of study participants

A total of 415 women had responded to the questionnaires making a response rate of 100% (all study participants were volunteered to participate). The age of the study participants was between 18 and 43 years with a mean (\pm SD) age of $29.5 \pm (3.6)$. Out of the total respondents, 111(26.7%) were

Table 3: Obstetrics-related characteristics of LARC user women in health facilities of Bahir Dar city, Northwest Ethiopia, 2021(n= 415).

Variables	Categories	Frequency	Percentage
Parity	Nullipara	64	15.4
	Primipara	70	16.9
	Multipara	199	48.0
	Grand Multipara	82	19.7
Number of living children	No children	78	18.8
	1-2 children	228	55.0
	3-4 children	52	12.5
	>5 children	57	13.7
History of abortion	Yes	207	49.9
	No	208	50.1
Desire for pregnancy	Yes	254	61.2
	No	161	38.8
Time to conceive (n=254)	Within two years	162	63.8
	After two years	92	36.2

Table 4: Contraception and health facility related characteristics of LARC users in Health facilities of Bahir Dar city, Northwest Ethiopia, 2021 (n= 415).

Variables	Categories	Frequency	Percentage
Type of LARC used	Implanon	298	71.8
	Jaddles	95	22.9
	IUCD	22	5.3
Past contraceptive utilization	Yes	327	78.8
	No	88	21.2
Method of contraceptive used(n=327)	OCP	104	31.8
	Injectable	165	50.5
	IUCD	4	1.2
	Implants	54	16.5
Place of LARC given	Hospital	114	27.5
	Health center	208	50.1
	Family guidance	53	12.8
	Maire stops	40	9.6
Counseling on the benefit of LARC	Yes	215	51.8
	No	200	48.2
Counseling on side effects of LARC	Yes	155	33.3
	No	260	62.7
Ever faced side effects	Yes	303	73.0
	No	112	27.0
LARC choose by	Own choice	181	43.6
	My husband	76	18.3
	Health professionals	104	25.1
	HEW	20	4.8
	Neighbors/friends	34	8.2
The Main reason to choose LARC	Safety	117	28.2
	Effectiveness	57	13.7
	Long protection	141	34.0
	Reduce appointment	52	12.5
	Removed at any time	33	8.0
	Immediate fertility return	15	3.6
Follow up/appointment	Yes	208	50.1
	No	207	49.9
Reasons for discontinuation of LARCs(N=275)	Side effects	92	33.5
	To be pregnant	90	32.7
	No husband/divorce	40	14.5
	Loss of implant in the arm	10	3.6
	Missed IUCD string	6	2.2
	Become pregnant	3	1.1
	Myths/Misconception	34	12.4
Removal due to side effect (N=92)	Menstrual irregularity	48	52.2
	Weight change	17	18.5
	Unusual headache	15	16.3
	Insertion site pain	4	4.3
	Difficulty to work	8	8.7

found to be in the age category of > 35 years. Looking at educational status, 109(26.3%) had secondary school.

Obstetrics related characteristics

One hundred ninety-nine (48%) of the respondents were multipara. Out of those who gave birth, 228(55%) women have one to two live children and 254(61.2%) women had a desire for pregnancy soon.

Contraception and health facility related characteristics

Of the total participants, 298(71.8%), 95(22.9%), and 22(5.3%) were Implanon, Jaddles, and IUCD users for the purpose of contraception respectively. Among these, 327(78.8%) used modern contraceptives before the current LARCs. Concerning counseling service, 200(48.2%) did not get counseling about the benefits of the LARCs whereas 260(62.7%) of participants did not get counseling about possible side effects. The main reason to use LARCs is its nature of long protection which accounts 141(34%).

Half of the participants, 208(50.1%) were appointed and 303(73%) of the total participants had experienced side effects. Among suggested reasons identified for discontinuation, side effects of LARCs were the first accounted for 102(37.1%) mainly due to menstrual irregularity accounts 52(51%).

Other factors including myths/misconceptions

Among participants a total of 69 women requests removal of

LARCs due to misconceptions.

Proportion of discontinuation of long-acting reversible contraceptives

This study was aimed at assessing the proportion of discontinuation of LARCs and its associated factors among women who were LARC users and come with method-related complaints to the selected health facilities during the study period. From a total of 415 study participants, 66.3% (95% CI:61.42-69.14) had discontinued their LARCs. The mean(\pm SD) of the overall duration of LARCs utilization

Table 5: Myth/misconception characteristics of LARC user women in health facilities of Bahir Dar City, Northwest Ethiopia, 2021(n=69)

Variables	Frequency	Percentage
Peer pressure/neighbors' influence	13	18.8
Decreasing sexual activity/libido	16	23.2
Husband objection/order	20	28.9
Fear of migration to other body parts	8	11.6
Fear of infertility	7	10.2
Fear of cancer	5	7.3

Figure 3: Duration of LARC utilization in years among women who discontinued LARCs in Bahr Dar city health facilities, Northwest Ethiopia, 2021(n=275)

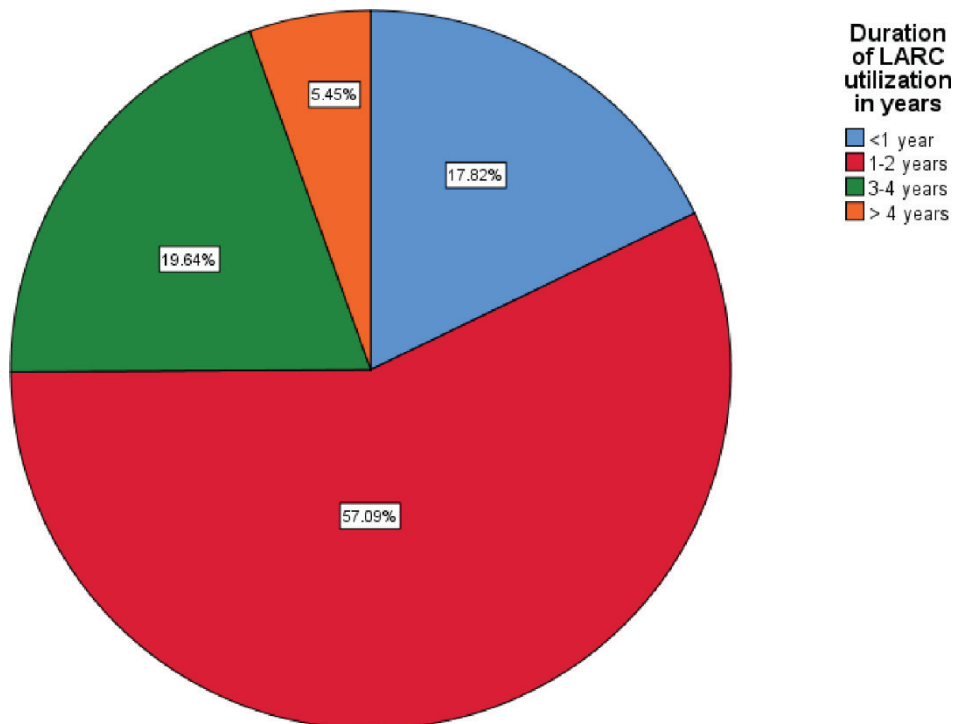


Table 6: Factors associated with LARCs discontinuation among user women in Health facilities of Bahir Dar city, Northwest Ethiopia, 2021 (n=415)

Variables	LARC Discontinued		COR (95% CI)	AOR (95% CI)	P-value
	Yes (N, %)	No (N, %)			
Religion					
Orthodox	194 (63.8%)	110 (36.2%)	1	1	
Muslim	64 (78%)	18 (22%)	0.49 (0.280-0.880)*	0.69 (0.363-1.298)	.247
Protestant	11 (64.7%)	6 (35.3%)	0.96 (0.346-2.673)	1.20 (0.378-3.821)	.755
Others©	6 (50%)	6 (50%)	1.76 (0.555-5.601)	1.64 (0.448-6.014)	.454
Occupation					
Housewife	114 (66.3%)	58 (33.7%)	0.86 (0.492-1.501)	1.07 (0.569-1.998)	.842
Merchant	47 (77%)	14 (23%)	0.50 (0.237-1.069)	0.77 (0.333-1-768)	.535
Private employee	36 (80%)	9 (20%)	0.42 (0.178- 0.901*	0.53 (0.209-1.333)	.176
Student	29 (49.2%)	30 (50.8%)	1.75 (0.880- 3.473)	0.704 (0.797-3.643)	.169
Government employee	49 (62.8%)	29 (37.2%)	1	1	
Education					
Unable to read & write	45 (68.2%)	21 (31.8%)	0.59 (0.314-1.142)	0.44 (0.220-0.885)	.021
Read & write	62 (81.6%)	14 (18.4%)	0.29 (0.144-0.581)***	0.31 (0.148-0.63)	.001
Primary	44 (74.6%)	15 (25.4%)	0.44 (0.217-0.882) *	0.39 (0.184-0.812)	.012
Secondary	65 (59.6%)	44 (40.4%)	0.87 (0.504-1.495)	0.85 (0.478-1.496)	.565
College & above	59 (56.2%)	46 (43.8%)	1	1	
Pregnancy desire					
Yes	169 (66.5%)	85 (33.5%)	2.49 (1.647-3.851) ***	2.57 (1.639-4.020)	<.001
No	134 (83.2%)	27 (16.8%)	1	1	
Type of LARC used					
Implanon	191 (64.1%)	107 (35.9%)	1.66 (0.485-0.997)	1.53 (0.878-2.680)	.133
IUCD	13 (59.1%)	9 (40.9%)	2.05 (0.778-5.390)	2.38 (0.847-6.948)	.112
Jaddles	71 (74.7%)	24 (25.3%)	1	1	
Past contraception					
Yes	227 (69.4%)	100 (30.6%)	1	1	
No	48 (54.5%)	40 (45.5%)	1.89 (1.169-3.060) **	2.01 (1.192-3.376)	.009
Counseling on the benefit of LARC					
Yes	152 (70.7%)	63 (29.3%)	1	1	
No	123 (61.5%)	77 (38.5%)	1.51 (1.003-2.274) *	1.68 (1.081-2.624)	.021
Ever side effect					
Yes	158 (52.1%)	145 (47.9%)	1.94 (1.221-2.983)*	1.95 (1.207-3.164)	.006
No	76 (67.9%)	36 (32.1%)	1	1	
Follow up					
Yes	132 (63.5%)	76 (36.5%)	1.29 (0.655-0.985)	1.39 (0.885-2.172)	.154
No	143 (69.1%)	64 (30.9%)	1	1	

*P-value less than 0.05 **P-value less than 0.01 ***P-value less than 0.001 ©Catholic & Adventist. AOR: For Bivariate Analysis; AOR: For Multivariate Analysis

in months was 25.2 + 9.8. The discontinuation of Implanon, Jaddles, and IUCD were 34.3 %, 21 % and 11 % respectively.

Duration of LARCs utilization before discontinuation

More than half of the participants discontinued after one and before three years of utilization which accounts 157(57.1%), 54(19.6%) discontinued between 3 and 4 years.

Factors associated with discontinuation of LARCs

Bivariate analysis was conducted first, followed by the presentation of the results. Then a multivariate analysis was performed to control for confounding variables. Based on the bivariate analysis, mother's education level, the desire to become pregnant, the type of LARC used, previous contraceptive use, advice on LARCs benefits, side effects, and follow-up were entered into a multivariate regression analysis. However, only maternal education, pregnancy desire soon, no past contraceptive utilization, not being counselled for benefits, and experiencing side effects were found to be significantly associated with discontinuation. Long-acting reversible contraceptive dropout rates among women with no formal education were 51% lower than among those with a college education or higher (AOR = 0.49; 95% CI: 0.30–0.82). The odds of discontinuation of women who attended a primary level of education was reduced by 61% than college and above (AOR=0.39;95% CI:0.18-0.81, P=0.012)

The odds of discontinuing LARCs among women who desire to be pregnant in the near future was 2.6-fold higher than their counterparts (AOR=2.57; 95% CI:1.64-4.02, P=<0.001). Women who didn't use contraceptives before current LARC utilization were about 2 times more likely to discontinue than their counter parts (AOR=2.01;95% CI:1.19-3.38, P=0.009).

The odds of discontinuing LARCs among women who experienced side effects were 2 times higher than those who didn't experience side effects (AOR=1.95; 95 CI:1.21-3.16, P=0.006). This study also showed that the odds of discontinuation of long-acting reversible contraceptives among women who had not received counseling about the benefit of LARCs was 1.7 times higher compared to their counterparts (AOR=1.68 95% CI:1.08-2.62, P=0.021).

DISCUSSION

In this study, the overall proportion of LARCs discontinuation among women was 66.3% (95% CI: 61.42–69.14) with average utilization for 25.2 + 9.8 in months. Maternal education, pregnancy desire soon, no past contraceptive utilization, not being counselled for benefits, and experiencing side effects were found to be significantly associated with LARC discontinuation. For Implanon, this is lower than a study done in Debretabore, Northwest Ethiopia, 65% (95%, CI: 60.4%–69.5%) with a mean duration of 21.5+ 8.4 months.²⁰ The most suggested reason for this might be time elapsed, education as it was not associated factor for discontinuation in Debretabore, and ethnic variation in which

all participants in Debretabore were Amhara whereas around 6.7% of the participants were not Amhara in Bahir Dar city (in this study).

Discontinuation of LARCS in this study is low compared with the secondary data analyzed from EDHS 2016, where 61% of implants and about 45% of IUCDs users were discontinued at the end of three years.⁸ This might be due to the discrepancy of population structure of the national pattern and variation in duration of utilization before discontinuation. This study also lower than a study done in Colorado, Western United States that is 81.7%.²² The possible explanation might be the discontinuation in Colorado was within 30 months of utilization. The other explanation might be most of the health professionals in our setup might didn't easily accept complaints of removal since the proportion of utilization of LARCs is low (18.4%) in our setup.²³

However, discontinuation of LARCs in this study is higher than studies conducted in the Sidama region, southern Ethiopia,10.3%²⁴ and Hawassa City, southern Ethiopia,56.6%.¹ This difference might be due to duration of utilization in Sidama region was within one year and presence of the religious varieties in Sidama region and Hawassa city as most of the study participants in Bahir Dar were Orthodox Christian. Due to the pandemic of COVID-19 health care providers might not expense much time for detailed counseling.

In this study, the odds of discontinuation of LARCs were reduced by 51% and 61% among women who have no formal education and attended primary school respectively compared with women who attended college and above. This is in line with related studies conducted in Bahir Dar, northwest Ethiopia¹⁷ and Debre Markose town, northeast Ethiopia.²⁵ This finding is contrary to expectations, and a possible explanation could be that women who had higher education levels might seek healthcare sooner than their counterparts when they have complaints and any disturbance from normal physiology and this might increase to discontinue.¹⁷ And also, women who have lower educational levels might accept counseling and reassurances provided by health professionals about their complaints of LARCs so that they might reduce discontinuation.

On the other hand, this finding is not supported by a study done in Sidama region, Southern Ethiopia.²⁴ and Hawassa City, Southern Ethiopia.¹ The possible reasons could be different as follow. This is might be due to the variety in the composition of study participants concerning educational level in which more than half of the participants in this study attended secondary school and above. It might be also due to the differences in study design (community based) and duration of LARCs (for one year) compared to a study conducted in Sidama region. The differences in sociocultural of the population might also brought this variation.

This study revealed that the odds of discontinuation of LARCs among women who desire to be pregnant in the near

future was 2.6 times higher than their counter parts. This is in agreement with studies done in Ambo town, Central Ethiopia ²¹, Hawassa city ¹, analyzed of EDHS 2016 data ⁸, Kenya ²⁷, Nigeria ²⁸, and Zambia.²⁹ The possible reason might be the improper choice of the method as the nature of the method is long-acting. Evidence shown that LARCs must be removed when the clients have desire to conceive.³⁰

The odds of discontinuation of LARCs among women who have not used any modern contraceptive before the current LARC were about 2.0 times high likely than their counterparts. This finding is not supported by studies conducted in Sidama region ²⁴, Hawassa city ¹, and worldwide.⁵ This could be because of experienced mothers acquired the necessary knowledge and attitude towards the LARCs, while others could be influenced by false beliefs, myths, and misconceptions. This might also be due to women who have used contraceptives before current LARC and experienced different side effects especially from short-acting could appreciate the safety and other advantages of LARCs and can tolerate minor side effects of LARCs.⁶

The odds of discontinuation of LARCs among women who had not received pre-insertion counseling services about the benefits of the LARCs was 1.7 times higher than from their counter parts. This is parallel with studies conducted in Sidama region ²⁴ and Hawassa City.¹ The possible reason for this similarity might be attributed to didn't receive counseling about the advantages of the method might have a negative impact on users to tolerate minor discomforts or side effects.³¹ Pre-insertion counseling about the possible side effects and support by health professionals might help women to continue the utilization of contraception. However, this finding is not agreed with a study conducted in Myanmar.¹⁰ The suggested explanation for this might be due to the low socio-economic status, poor quality of services, unfavorable participants' attitudes towards LARC in our set up than Myanmar.³²

The odds of discontinuing LARCs among women who experienced side effects were about 2.0 times higher than those who did not experience side effects. This is consistent with the studies conducted in Hawassa ¹, analysis of EDHS 2016 data ⁸, Nigeria ³⁴, South Africa ³⁵ and Bangladesh.³⁶ The most possible reason for this might be once women developed side effects, they may not tolerate the counseling and management services delivered by health professionals for their complaints due to fear of happening different complications on their health in the future.¹⁷ Unexpected changes in menstrual bleeding due to the nature of the method by itself might enforce women to seek removal.²⁶

Recommendations

The Amhara Regional Health Bureau and other stakeholders should better supervise and follow health facilities on counselling for LARC users. The Bahir Dar health department is better able to create community awareness about implants to decrease discontinuation. Selected

health facilities in Bahir Dar City should follow healthcare providers' instructions to perform their duties in line with the standards and recommendations. Healthcare providers should practice pre-insertion counselling by emphasizing the possible side effects and benefits of LARCs. Early side effect management and reassurance are recommended to decrease discontinuation. Finally, the quality of LARC service provision through qualitative research is recommended.

Strengths and Limitation

Strengths: The strength of this study is including all the three components of LARCs (IUCDS, Implanon and Jaddles), the high response rate and the control for confounding variables. **Limitation:** The cross-sectional nature of the data collection, which allows for the identification of associations but not causal relationships. On the other hand, since this study was conducted on reversible long-acting contraceptives discontinuation as a whole unlike most of other studies which were done on a single contraceptive, it was somewhat challenging to obtain literature in line with the title (especially in our nation).

CONCLUSION

The overall discontinuation of reversible long-acting contraceptives among women who were using LARCs was found to be low compared to the analysis of EDHS 2016. The associated factors for discontinuation of LARCs among user women of reproductive age were educational level, the desire of pregnancy in the near future, did not used modern contraceptives before LARCs, not received counseling about the benefit of LARCs and experienced side effects. This research might give a baseline data on LARCs utilization and factors for discontinuation in our setup especially in the study area. An observational quality of LARC service provision through qualitative research is recommended.

REFERENCES

1. Abebe BA, Assefa N, Mengistie B. Discontinuation of Reversible Long-Acting Contraceptive and Associated Factors among Female Users in Health Facilities of Hawassa City, Southern Ethiopia: Cross-Sectional Study. *Open Access J Contracept.* 2020;11:113-123. doi:[10.2147/OAJC.S259978](https://doi.org/10.2147/OAJC.S259978)
2. Espey E, Ogburn T. Long-acting reversible contraceptives: intrauterine devices and the contraceptive implant. *Obstet Gynecol.* 2011;117(3):705-719. doi:[10.1097/AOG.0b013e31820ce2f0](https://doi.org/10.1097/AOG.0b013e31820ce2f0)
3. Rademacher KH, Vahdat HL, Dorflinger L, Owen DH, Steiner MJ. Global introduction of a low-cost contraceptive implant. In: Kulczycki A, ed. *Critical Issues in Reproductive Health.* Springer Dordrecht; 2014:285-306. doi:[10.1007/978-94-007-6722-5_14](https://doi.org/10.1007/978-94-007-6722-5_14)
4. Ali MM, Sadler RK, Cleland J, Ngo TD, Shah IH. Long-term contraceptive protection, discontinuation and switching behaviour: Intrauterine device (IUD) use dynamics in. *World*

- Health Organization and Marie Stopes International; 2011. Accessed November 1, 2024. https://cdn.who.int/media/docs/default-source/reproductive-health/srhr-documents/long-term-contraceptive-protection-discontinuation-switching-behaviour.pdf?sfvrsn=a13a7139_5&download=true
5. Bahamondes L, Fernandes A, Monteiro I, Bahamondes MV. Long-acting reversible contraceptive (LARCs) methods. *Best Pract Res Clin Obstet Gynaecol.* 2020;66:28-40. doi:[10.1016/j.bpobgyn.2019.12.002](https://doi.org/10.1016/j.bpobgyn.2019.12.002)
 6. Teunissen AM, Grimm B, Roumen FJ. Continuation rates of the subdermal contraceptive Implanon® and associated influencing factors. *Eur J Contracept Reprod Health Care.* 2014;19(1):15-21. doi:[10.3109/13625187.2013.862231](https://doi.org/10.3109/13625187.2013.862231)
 7. Asnake M, Tilahun Y. Scaling Up Community-Based Service Delivery of Implanon: The Integrated Family Health Program's Experience Training Health Extension Workers. *Pathfinder International/Ethiopia.* January 2010. Accessed November 1, 2024. <https://chwcentral.org/wp-content/uploads/2016/04/Scaling-Up-Community-Based-Service-Delivery-of-Implanon-The-Integrated-Family-Health-Programs-Experience-Training-Health-Extension-Workers.pdf>
 8. Fekadu GA, Omigbodun AO, Roberts OA, Yalew AW. 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. doi:[10.1186/s13690-020-00419-w](https://doi.org/10.1186/s13690-020-00419-w)
 9. Sonfield A, Kost K, Gold RB, Finer LB. The public costs of births resulting from unintended pregnancies: national and state-level estimates. *Perspect Sex Reprod Health.* 2011;43(2):94-102. doi:[10.1363/4309411](https://doi.org/10.1363/4309411)
 10. Tin KN, Maung TM, Win T. Factors that affect the discontinuation of family planning methods in Myanmar: analysis of the 2015-16 Myanmar Demographic and Health Survey. *Contracept Reprod Med.* 2020;5(1):20. doi:[10.1186/s40834-020-00126-5](https://doi.org/10.1186/s40834-020-00126-5)
 11. Castle S, Askew I. Contraceptive discontinuation: reasons, challenges, and solutions. *Population Council;* 2015. Accessed November 1, 2024. https://popdesenvolvimento.org/images/imprensa/FP2020_ContraceptiveDiscontinuation_SinglePageRevise_12.16.15.pdf
 12. Ahmed S, Li Q, Liu L, Tsui AO. Maternal deaths averted by contraceptive use: an analysis of 172 countries. *Lancet.* 2012;380(9837):111-125. doi:[10.1016/S0140-6736\(12\)60478-4](https://doi.org/10.1016/S0140-6736(12)60478-4)
 13. Samuel M, Fetters T, Desta D. Strengthening Postabortion Family Planning Services in Ethiopia: Expanding Contraceptive Choice and Improving Access to Long-Acting Reversible Contraception. *Glob Health Sci Pract.* 2016;4(suppl 2):S60-S72. doi:[10.9745/GHSP-D-15-00301](https://doi.org/10.9745/GHSP-D-15-00301)
 14. Riley C, Garfinkel D, Thanel K, et al. Getting to FP2020: Harnessing the private sector to increase modern contraceptive access and choice in Ethiopia, Nigeria, and DRC. *PLoS One.* 2018;13(2):e0192522. doi:[10.1371/journal.pone.0192522](https://doi.org/10.1371/journal.pone.0192522)
 15. Simmons RG, Sanders JN, Geist C, Gawron L, Myers K, Turok DK. Predictors of contraceptive switching and discontinuation within the first 6 months of use among Highly Effective Reversible Contraceptive Initiative Salt Lake study participants. *Am J Obstet Gynecol.* 2019;220(4):376.e1-376.e12. doi:[10.1016/j.ajog.2018.12.022](https://doi.org/10.1016/j.ajog.2018.12.022)
 16. Biza N, Abdu M. Long-acting reversible contraceptive use and associated factors among contraceptive users in Amhara region, Ethiopia, 2016. A community based cross sectional study. *Medico Research Chronicles.* 2017;4(5):469-480.
 17. Biza N, Abdu M. Long-acting reversible contraceptive use and associated factors among contraceptive users in Amhara region, Ethiopia, 2016. A community based cross sectional study. *Medico Research Chronicles.* 2017;4(5):469-480.
 18. KC S, Barakat B, Goujon A, Skirbekk V, Sanderson W, Lutz W. Projection of populations by level of educational attainment, age, and sex for 120 countries for 2005-2050. *Demogr Res.* 2010;22:383-472. doi:[10.4054/DemRes.2010.22.15](https://doi.org/10.4054/DemRes.2010.22.15)
 19. Melesse MB, Geremew AB, Abebe SM. High prevalence of caesarean birth among mothers delivered at health facilities in Bahir Dar city, Amhara region, Ethiopia. A comparative study. *PLoS One.* 2020;15(4):e0231631. doi:[10.1371/journal.pone.0231631](https://doi.org/10.1371/journal.pone.0231631)
 20. Melkamu Asaye M, Syoum Nigussie T, Mequannt Ambaw W. 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. doi:[10.1155/2018/3597487](https://doi.org/10.1155/2018/3597487)
 21. Nageso A, 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(1):189. doi:[10.1186/s12905-018-0678-x](https://doi.org/10.1186/s12905-018-0678-x)
 22. Cohen R, Sheeder J, Teal SB. Predictors of Discontinuation of Long-Acting Reversible Contraception Before 30 Months of Use by Adolescents and Young Women. *J Adolesc Health.* 2019;65(2):295-302. doi:[10.1016/j.jadohealth.2019.02.020](https://doi.org/10.1016/j.jadohealth.2019.02.020)
 23. Ayenew AA. Determinants of long acting reversible contraceptive Utilization in Bahir Dar city, Ethiopia- results from institutional based cross sectional study. *Research Square.* Preprint posted online August 14, 2019. doi:[10.21203/rs.2.12840/v1](https://doi.org/10.21203/rs.2.12840/v1)
 24. Geja E, Belayneh F, Legesse D, et al. Prevalence of Early Removal of Long-Acting Contraceptive Methods and Its Associated Factors in Sidama Regional State, Ethiopia. *Open Access J Contracept.* 2021;12:35-44. doi:[10.2147/OAJC.S280405](https://doi.org/10.2147/OAJC.S280405)
 25. Siyoum M, Mulaw Z, Abuhay M, Kebebe H. Implanon discontinuation rate and associated factors among women who ever used Implanon in the last three years in Debre Markos town, Northwest Ethiopia, 2016, cross sectional study. *ARC J Public Health Community Med.* 2017;2(1):8-16. doi:[10.20431/2456-0596.0201003](https://doi.org/10.20431/2456-0596.0201003)

26. Mamo K, Siyoum M. Premature Implanon Discontinuation and Associated Factors Among Implanon User Women in Ambo town, Central Ethiopia,
27. Kungu W, Khasakhala A, Agwanda A. Trends and factors associated with long-acting reversible contraception in Kenya. *F1000Res.* 2020;9:382. doi:[10.12688/f1000research.23857.1](https://doi.org/10.12688/f1000research.23857.1)
28. Isa B, Ibrahim SM, Mandara M, Bako B. Uptake and reason for discontinuation of long-acting reversible contraception in a tertiary hospital: A 5 years retrospective review. *Afr J Med Health Sci.* 2020;19(9):142-149. doi:[10.5897/AJMHS2020.0111](https://doi.org/10.5897/AJMHS2020.0111)
29. Haddad L, Wall KM, Vwalika B, et al. Contraceptive discontinuation and switching among couples receiving integrated HIV and family planning services in Lusaka, Zambia. *AIDS.* 2013;27(suppl 1):S93-S103. doi:[10.1097/QAD.000000000000039](https://doi.org/10.1097/QAD.000000000000039)
30. Staveteig S, Mallick L, Winter R. Uptake and discontinuation of long-acting reversible contraceptives (LARCs) in low-income countries. ICF International; 2015. DHS Analytical Studies No. 54. Accessed November 1, 2024. <https://www.dhsprogram.com/pubs/pdf/AS54/AS54.pdf>
31. Dickerson LM, Diaz VA, Jordon J, et al. Satisfaction, early removal, and side effects associated with long-acting reversible contraception. *Fam Med.* 2013;45(10):701-707.
32. Hrusa G, Spigt M, Dejene T, Shiferaw S. Quality of Family Planning Counseling in Ethiopia: Trends and determinants of information received by female modern contraceptive users, evidence from national survey data, (2014- 2018). *PLoS One.* 2020;15(2):e0228714. doi:[10.1371/journal.pone.0228714](https://doi.org/10.1371/journal.pone.0228714)
33. Weldemariam KT, Gezae KE, 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(1):1745. doi:[10.1186/s12889-019-8088-z](https://doi.org/10.1186/s12889-019-8088-z)
34. Ezegwui HU, Nwogu-Ikojo EE, Ikeako LC, Nweze S. Trend in the use of intra-uterine contraceptive device (IUCD ,TCU 380A), in Enugu, Nigeria. *Niger J Med.* 2013;22(3):193-197.
35. Mrwebi KP, Goon DT, Owolabi EO, Adeniyi OV, Seekoe E, Ajayi AI. Reasons for Discontinuation of Implanon among Users in Buffalo City Metropolitan Municipality, South Africa: A Cross-Sectional Study. *Afr J Reprod Health.* 2018;22(1):113-119. doi:[10.29063/ajrh2018/v22i1.11](https://doi.org/10.29063/ajrh2018/v22i1.11)
36. Jain A, Reichenbach L, Ehsan I, Rob U. "Side effects affected my daily activities a lot": a qualitative exploration of the impact of contraceptive side effects in Bangladesh. *Open Access J Contracept.* 2017;8:45-52. doi:[10.2147/OAJC.S140214](https://doi.org/10.2147/OAJC.S140214)

ACKNOWLEDGMENTS

First, we would like to express our sincere gratitude to Bahir Dar University, the College of Medicine and Health Sciences, the Department of Midwifery, and their assigned advisors. Second, we would like to express our heartfelt thanks and appreciation to the advisors for their endless support and for giving constructive comments throughout this research development. Finally, we would like to extend our appreciation and thanks to selected health facilities, data collectors, study participants, healthcare professionals, and other individuals who assisted us in this research development.

CONFLICTS OF INTEREST

The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.

FUNDING

There were no specific funds or grants for this work. Bahir Dar University as a requirement for ethical approval but had no other role in this study.

AUTHORS' CONTRIBUTIONS

YDM, MYM, AAG and AMZ contributed in research concept and design, collection of data, analysis and interpretation. YDM, GDK, ZFW, SWL and TWB contributed in article writing, critical revision of the article and final approval of the article. All authors read and approve the article.