

Research Article

Early Discontinuation of Implanon and Its Determinants Among Women Who Ever Used Implanon: A Cross-Sectional Study in Oromia Region of Ethiopia

Damitu Gudina Defa¹, Legesse Tadesse Wodajo^{2,*} 

¹Health Office, Asella Town Administration, Oromia Region, Asella, Ethiopia

²College of Health Science, Arsi University, Asella, Ethiopia

Abstract

Introduction: Contraceptive utilization reduces maternal mortality and improves child survival. The reasons for ineffective practices need proper exploration. However, in the study area, information on the level of early Implanon discontinuation and contributing factors is scarce. **Objective:** To assess early Implanon discontinuation and associated factors among women seeking Implanon removal services in public health facilities in Asalla Town, Oromia Region, Ethiopia, 2021. **Methods and materials:** A facility-based cross-sectional study was conducted from March 27, 2021, to April 27, 2021, among 388 Implanon user women. They were selected by using a systematic random sampling technique. The data were collected by a structured questionnaire using a face-to-face interviewer and entered Epi Info version 7 and exported to SPSS version 21 for analysis. Then the early Implanon discontinuation and related factors were analyzed using logistic regression. Factors that have significant association declared using p values less than 5% with 95%. **Results:** A total of 388 participants responded to the questionnaires, for a response rate of 100%. Among the users of Implanon, 318 (83.7%) discontinued treatment early. Husband educational level (primary) (adjusted OR=0.06 (95% CI: 0.01-0.56), no husband (adjusted OR=0.06 (95% CI: 0.01-0.41), women who needed to go abroad (adjusted OR, 0.09: 95% CI(0.02-0.39)), age (25-29 years) (adjusted OR=0.15 (95% CI: 0.03-0.86) and number of children (adjusted OR=0.04 (95% CI: 0.02-0.78)) were significantly associated with Implanon discontinuation. **Conclusion and recommendation:** The early Implanon discontinuation rate in this study was very high (83.7%). Having educated partner and more number of children (4-5) were more likely to continue the LARCs, while having no husband and a need to go overseas had less drive than husband objection towards early removal among the study group. The age between 25-29 years were related with more sustained use of LARCs to the expected period than those in 15-19. Effort should be made to address women's health and fertility in the programs to increase the continuation rate of Implanon use.

Keywords

Implanon, Discontinuation, Factors, Women, Contraception

1. Introduction

Long-acting reversible contraception (LARC) is reversible, which means that once a woman stops using them, the

*Corresponding author: legeset2008@gmail.com (Legesse Tadesse Wodajo)

Received: 29 October 2024; **Accepted:** 15 November 2024; **Published:** 3 December 2024



Copyright: © The Author(s), 2024. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

contraceptive effect wears off, and the woman can become pregnant [1]. Implanon is a type of LARC and is a single-rod contraceptive that provides up to 3 years of protection from pregnancy and has a clinical failure rate of less than 1% [2, 3]. The contraceptive effect of Implanon is achieved by the inhibition of ovulation, an increase in cervical mucus viscosity that hampers the passage of spermatozoa and alterations in the endometrium [1-3]. Once women are inserted, they require little user compliance, and the return to fertility is fast following their removal [2-4]. Although it has good features, its utilization rate is still low among women of reproductive age around the globe [5]. Currently, about one in three pregnancies globally are not planned annually: these are due to contraceptive discontinuation that may be connected with an inadequate motivation to avoid it [6].

The rate of contraceptive discontinuation in developing countries not only accounts for the majority of cases, with a wide range from 18-63% but also amongst women who are currently in need of preventing conception [7-9]. Conferring to South African Family Practice and other studies in Ethiopia, Implanon discontinuation occurred in up to 43% of women before the end of the 3 years, most of whom experienced side effects, lack of counseling and other related reasons [6, 7, 9]. Implanon users experience bleeding patterns such as amenorrhea and erratic or lengthy flow. To alleviate this problem, proper counseling of the women on the characteristics and expectations improve continuation rates for injectable and implantable progesterone contraceptives [7, 9]. In countries outside of sub-Saharan Africa, discontinuation rates vary between 19 and 36% [8].

Ethiopia's programme of health extension launch brought about enormous increase of contraceptive use in the past few decades (HEP) [10]. However, global experience has slowed over the long run: only closely one in three of women prefer to postpone their succeeding delivery for at least 2 years, and only eight in per hundred of women presently practice long-acting reversible contraceptive (LARC) methods [9]. Some studies report that implant users account for only approximately 8% of all method users in some part of Ethiopia [5].

Evidence from different studies strongly suggests that the provision of quality family planning services can increase the uptake and prevalence of contraception and decrease its discontinuation [11, 12]. This does not mean that all women are happy with their choices of Implanon: rather, a significant number of women choose the method and then request early removal [5, 13-16]. Early removal can show the level of the efficacy of family planning services. Over-all, the risk of unintended conception of women happen at the time couples terminate using a contraceptive technique, even for a short-lived period. These unplanned pregnancies often lead to larger family sizes than intended and results to higher rates of total fertility [6], which in turn has social and economic consequences [8].

The American College of Obstetricians and Gynecologists has

recommended LARC methods as first-line contraceptive options for both adults and adolescents [11]. However, rates of LARC discontinuation at 6 months vary between 6 and 17% [11, 13], although some reports have reported rates as low as 2.6% [5], with cramping and changes in bleeding patterns commonly reported as reasons for removal of Implanon [11, 13, 16].

Sub-Saharan Africa countries comprising Ethiopia have significantly high populations, reproductive health there are high populations and reproductive health challenges, which are associated with increased maternal death, a higher total fertility rate, and unplanned pregnancies [6]. In addition to its low use, early discontinuation is common for multiple factors [16]. To address the gap in contraceptive discontinuation, the government of Ethiopia has boarded on an Implanon scale-up initiative aimed at expanding access to and enhancing the use of Implanon at the community level through the innovative path of recruiting them to provide Implanon insertion services [17]. However, unplanned pregnancies and their impacts are progressively more affecting the women in low socioeconomic situations. Therefore, a number of reports on high rates of contraceptive discontinuation for reasons other than the reduced need for contraception are public health concerns because of their association with negative RH outcomes [12, 18-22].

2. Methods and Materials

2.1. Study Area

Asella town is found in the Arsi zone, Oromia regional state of Ethiopia. It is located 75 kilometers from Adama and 175 kilometers from Addis Ababa to the East of the nation. The town has 8 administrative kebeles with a total population of 110,874, of which 56,202 (50.6%) are males and 54,772 (49.4%) are females, as was projected from the country's 2007 census [23]. Among these 24 participants, 536 (23%) were in the reproductive age group. There are 20 health Institutions of this 1 Referral Hospital, 2 privet Hospital, 2 Governmental Health Center, 1 Privet Health Center, 14 Medium Clinic and 65 health professionals in the town, as stated by the Asella town health office in the 2020 profile.

2.2. Study Design, Period and Fund

The research employed a facility-based cross-sectional study design at Asella town Public Health Facilities from March 27, 2021–April 27, 2021, no fund was obtained.

2.3. Source and Study Population

The source population included all clients that visited the health facility for removal of Implanon after insertion during the data collection period at the study areas for any motive, while the study population was those selected with systematic random sampling from clients who came to have the

Implanon remove at the data acquiring time at the study areas for any reason.

$$349.5856 * (1 / (1 - 0.1)) = 349.428 = 388.$$

2.4. Inclusion and Exclusion Criteria

Inclusion includes women who came for removal of Implanon following insertion during the study period at the study areas for any reason. Women who came for removal of Implanon following insertion during the study period and who were critically ill and unable to communicate during the study were excluded.

2.5. Sample Size Determination and Sampling Procedure

2.5.1. Sample Size Determination

The sample size was predetermined by the formula for a single population proportion by seeing the following expectations: a 95% confidence level, a margin of error (0.05), and a 65% proportion of early Implanon removal rate from a research had done in Debre Tabor Town [6]. By using the single population proportion formula, $N = \frac{(z\alpha/2)^2 p(1-p)}{a^2} = [(1.96)^2 (0.65) (.35) / (0.05)^2] = 349.5856$. Since the topic was sensitive, there were expectations about nonresponses, 10% of the sample was allowed, and the total sample size was

2.5.2. Sampling Procedure

Four (two from the public and two from nongovernmental) health facilities that provide the Implanon removal service to Asella town and the surrounding population (Asella Hospital and Asella Health Center from the Government and Family Guidance Association of Ethiopia and Marie Stops Ethiopia were from nongovernmental) were comprised in the study. The predetermined study sample was proportionally distributed to be taken from the selected facilities using the previous average client flow that was obtained from respective log-books. The mean five-month women visit for family planning users of Asella Hospital, Asella Health Center, Family Guidance Association of Ethiopia, and Marie Stops Ethiopia was 16,982: of these, totally 843 users were found to book for the removal of Implanon during the last five months from Asella town public health facilities. The subjects of the study approached by using systematic random sampling technique from Implanon removal women who came at the health the respective facilities at the study time. The woman to start with in each health facility was recruited by the lottery technique. Every 2nd of the woman who presents for removal of the Implanon in each health facility from their order of family planning visits during the data collection time was nominated (Figure 1).

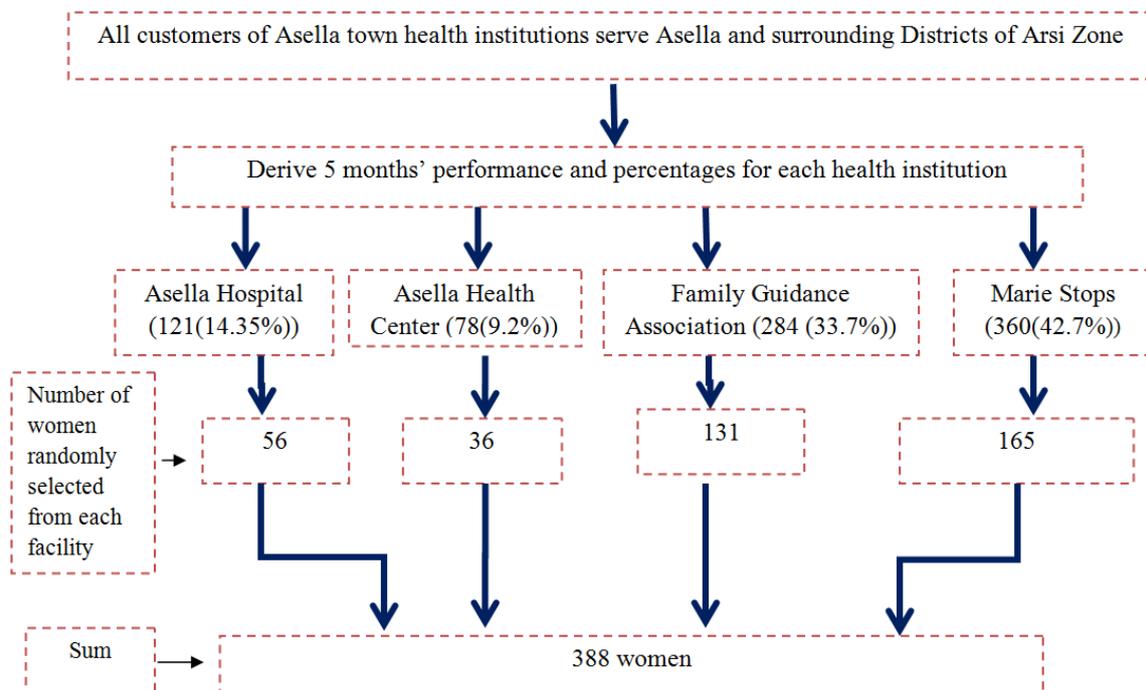


Figure 1. Schematic representation of the sampling procedure for early Implanon discontinuation and associated factors in Asella Town Health Facilities, Arsi Zone, Oromia Region, 2021.

2.6. Study Measurements

2.6.1. Outcome Variables

The primary outcome variable of this study was early Implanon discontinuation. It is defined as the removal of Implanon by health professionals before 2.5 years of utilization, as adopted from a reputable journal, as given in the operational definition section.

2.6.2. Independent Variables

There were four domains. The first domain included sociodemographic characteristics such as age, marital status, religion, occupation, residence and education. The second factor was maternal: children number, number of deliveries, abortion and medical problems. The third factor was social factors: the husband's object, the husband's involvement, the husband's ability to go abroad and neighbors' influence. Fourth, we examined the following method-related factors: side effects, past contraceptive utilization, desire for pregnancy, follow-up and counseling.

2.7. Operational Definitions

The terms used in this study are the same as those used in this paragraph. Contraceptive: an agent or device that is intended to prevent conception [Birhane et al., 2015]. Counseling involves making women aware of a method's long-term protection, side effects, and effectiveness. Early Implanon discontinuation was defined as the removal of Implanon by health professionals before 2.5 years of use [21]. Long-acting reversible contraceptives, which are contraceptive methods that can be used for 3–10 years but can be removed at any time, are termed LARCs. Menstrual disruption is any deviation of a woman's regular menstrual cycle. Unintended pregnancy: This is a pregnancy without a maternal plan. Side effects, such as menstrual disruption, insertion arm pain, headache, and acne, occur when women develop at least one side effect after Implanon insertion.

2.8. Data Collection Tool, Quality and Analysis

The data were collected by using semistructured and pretested face-to-face interview-based questionnaires. The questionnaire had three parts: sociodemographic, maternal and contraceptive-related factors. The questionnaire, which has both open and closed types, was adopted from different studies. One midwife supervisor and four diploma midwifery workers were employed for data collection.

To ensure the quality of the data, the questionnaire was pretested one week before the actual data collection time on 5% of Implanon discontinuer women at Asella Health Center, and appropriate modifications were made. One-day training was provided for the data collectors and supervisors a week ahead on the objective, purpose, technique and principles of the data collection. The data collectors and supervisors were trained

for one day before one week of the actual data collection. The interviewers were supervised at each site, and regular meetings were held between the data collectors and the supervisor.

Prior to the data entry a due review and check-up for comprehensiveness was done. The data were entered into Epi Info version 7 using preformed template to control for data entry errors. Then, it was exported to SPSS version 21 for analysis. Logistic regression was performed to identify candidates for further analysis. Accordingly, variables with a *p* value less than 0.25 during the crude analysis were maintained into multiple logistic regression models. Multiple logistic regression models were fitted to control for the possible effect of confounders, and the variables that were independently associated with early discontinuation of Implanon therapy were identified on the basis of 95% CIs and *p* values less than 0.05.

2.9. Ethical Issues

Ethical approval was obtained from the research Ethical Institutional Review Board (IRB) of the Arsi University, College of Health Science. Support letters were obtained from the Arsi University College of Health Science to both the Arsi Zonal Health Office and the Asella Town Health Office. According to the Helsinki World Medical Association declaration the principles of research involving human subjects were applied as follows. Informed written consent was taken from each participant to check their volunteer to participation following explanation of the aims of the research. Participation in the study was a volunteer, and a participant stated that she had the right to accept, refuse or quit participation at any time in the process. Confidentiality, dignity, privacy assured and personal details were recorded anonymously in any documentation related to this study. Since it was an exit interview, there was neither harm nor direct benefit from participation or refusal.

3. Results

3.1. Sociodemographic Characteristics

A total of 388 participants responded to the questionnaires, for a response rate of 100%. The ages of the study participants were between 15 and 45 years, with a mean (+SD) age of 27.14 ± 6.45 years. More than three-fourths of the participants (293, 75.5%) were married, 206 (53.1%) were Orthodox Christians, and 181 (46.6%) were housewives by occupation. More than half of the participants, 262 (67.5%), lived in urban areas, while 262 (67.5%) of them were Oromo in Ethnicity. More than half of the women who participated in the study (266 [68.8%] and 283 [72.9%], respectively) had a secondary education level or above. One hundred fifty-three (39%) of the participants' husbands were governmental employers. Three hundred twenty-six (84%) of the women had living

children between one and three years of age at the time of enrollment, with 1.67 (+SD) of living children (Table 1).

Table 1. Sociodemographic status of women who used implanon in Asella town, southeast Ethiopia, 2021 (n=388).

Variable	Frequency	Percent
Age		
15-19	54	13.9
20-24	101	26.0
25-29	96	24.7
30-34	77	19.9
≥ 35	60	15.5
Marital Status		
Married	293	75.5
Single	74	19.1
Widowed	12	3.1
Divorced	9	2.3
Religion		
Orthodox	206	53.1
Muslim	99	25.5
Protestant	75	19.3
Catholic	8	2.1
Residence		
Urban	262	67.5
Rural	126	32.5
Ethnicity		
Oromo	262	67.5
Amhara	111	28.6
Tigre	7	1.8
Gurage	8	2.1
Occupation		
House Wife	181	46.6
Student	98	25.3
Merchant	39	10.1
Government Employs	67	17.3
Daily labor	3	.8
Maternal education level		
No formal Education	40	10.3
Primary	82	21.1
Secondary and above	266	68.6

Variable	Frequency	Percent
Husband Educational Level		
No formal Education	43	11.1
Primary	62	16.0
Secondary and above	283	72.9
Husband occupation		
Farmer	77	19.8
Student	33	8.5
Merchant	117	30.2
Government Employees	153	39.4
Driver	8	2.1

3.2. Past Contraceptive History and Counseling Status During Implanon Insertion

Three hundred thirty (85.1%) participants had ever used one of the contraceptives before inserting Implanon. Among those, 121 (31.2%) women had used pills, 110 (28.4%) were injectable, and only 90 (23.2%) used implants. Fifty-eight patients (14.9%) had not used any type of modern contraceptive before Implanon was inserted. Among the participants, 372 (95.9%) received counseling services during the insertion of Implanon, and 312 (80.4%) received counseling about the side effects of Implanon. One hundred eight five (47.7%) and 51 (13.1%) of the participants received Implanon in the Health Center and Health Posts, respectively. Greater than half (226, 58.2%) of the participants developed side effects after inserting Implanon. Of the women who reported perceived side effects, 28 (7.2%) had headache, 89 (22.9%) had abnormal vaginal bleeding, 35 (9%) had weight gain, 37 (9.5%) had arm pain, 33 (8.5%) had difficulty working and 4 (1%) had difficulty doing so. A total of 158 (40.7%) of the participants were not appointed at a specific time for follow-up after Implanon insertion, and 230 (59.3%) were satisfied with the service provided during the insertion (Table 2).

Table 2. Past contraceptive history and counseling status of women who ever used Implanon in Asella town, southeast Ethiopia, 2021 (n=388).

Variable	Frequency	Percent
Have you ever used any contraceptive		
1-Yes	330	85.1
2-No	58	14.9
Methods ever used		
OCP	121	31.2

Variable	Frequency	Percent
Injectable	110	28.4
Implant	90	23.2
Emergency pills	9	2.3
Counseling on benefits of Implanon		
1-Yes	372	95.9
2-No	16	4.1
Counseling on side effect of Implanon		
1-Yes	312	80.4
2-No	76	19.6
Types of side effect counseled on		
Menstrual Irregularity	206	53.1
Weight gain	48	12.4
Unusual headache	17	4.4
Insertion arm pain	37	9.5
Difficult work	3	.8
Amenoria	1	.3
Place where Implanon taken		
Hospital	54	13.9
Health center	185	47.7
Health post	51	13.1
Private clinics	98	25.3
Who choose Implanon		
My own	198	51.0
My husband	29	7.5
Health professional	63	16.2
HEW	13	3.4
Shared choice	77	19.8
Neighbors	8	2.1
Follow up appointment		
1-Yes	230	59.3
2-No	158	40.7
Total	388	100.0
Develop side effect		
1-Yes	226	58.2
2-No	162	41.8
Parity		
0-3 pregnancy	308	79.4
4-5 pregnancy	57	14.7
>=6 pregnancy	23	5.9

Variable	Frequency	Percent
Living children in the house		
0-3 children	326	84.0
4-5 children	42	10.8
>=6 children	20	5.2

3.3. Discontinuation of Implanon

Of the 388 women who ever used Implanon, 318 (83.7%) women discontinued Implanon early. The women who discontinued treatment had used Implanon for between 5 and 29 months, with a mean tenure (SD) of 19.98±10.51 months. Almost all (97.4%) of the discontinuers had used Implanon only for less than two years and nine months, followed by 53.8% for less than one year and 2.6% for 14 months (Figure 2).

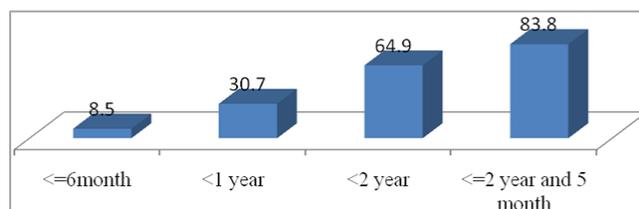


Figure 2. Early Implanon discontinuation among women who used Implanon in Asella town, southeast Ethiopia, 2021 (n=388).

3.4. Reasons for Discontinuation

The main reasons for Implanon discontinuation were desire for pregnancy (20.1%), husband objection (6.2%), husband go abroad (4.4%) and no husband (5.2%) (Figure 3).

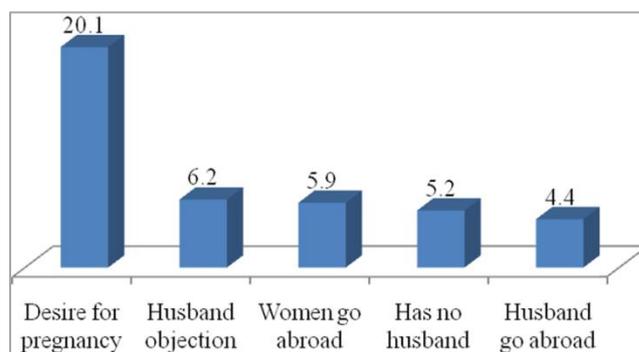


Figure 3. Main reasons for the discontinuation of Implanon among women who used Implanon in Asella town, southeast Ethiopia, 2021 (n=388).

3.5. Factors Associated with Early Implant Discontinuation

Variables with p values less than 0.25 in the bivariate analysis were subjected to multivariate analysis to remove confounding effects. The effects of those variables included in the model indicated that they were predictors of the current use of modern contraceptives in the study population ($P < 0.05$).

The results of multivariable binary logistic regression analysis showed that the reason for removal, husband's educational level, age of the woman and living children were significantly associated with the discontinuation of Implanon therapy, but after controlling for confounders, the discontinuation of Implanon therapy was not significantly related to marital status, parity, educational level of the woman, counseling on the benefits and side effects of

Implanon therapy and the need to conceive in the near future.

The results demonstrated that women who had no husband were less likely to discontinue Implanon early (adjusted OR, 0.06: 95% CI (0.01-0.41)) than women who had a husband objection, and those aged between 25 and 29 years were less likely to discontinue Implanon early (adjusted OR, 0.15: 95% CI (0.03-0.86), compared with women in the 15-19 age groups, husbands whose educational level was at least primary were less likely to discontinue Implanon early (adjusted OR, 0.06: 95% CI (0.01-0.56)) compared with women whose husband was not educated, women who needed to go abroad were less likely (adjusted OR, 0.09: 95% CI (0.02-0.39)) to discontinue Implanon early than women who had a husband objection, and women whose living children were between 4 and 5 years less likely to discontinue Implanon early (adjusted OR, 0.04: 95% CI (0.01-0.78)) than women whose children number were 0-3 (Table 3).

Table 3. Multiple binary logistic regression analysis revealed factors associated with early Implanon discontinuation among women who used Implanon in Asella town, Oromia, southern Ethiopia, 2021 (n=388).

Variable	Implanon Discontinuation		Crude OR 95% (C.I)	Adjusted OR 95% (CI)
	Yes (%)	No (%)		
Husband Educational Level				
No formal Education	34(79)	9(21)	1	1
Primary	44(71)	18(29)	1.48(0.66-3.30)	0.06(.01- 0.56)*
Secondary and above	240(85)	43(15)	2.28(1.21-4.32)	1.55(.46- 5.41)
Need to conceive near the future				
Yes	203(84)	38(16)	1	1
No	115(78)	32(22)	0.67(0.40-1.14)	1.41(0.45-4.45)
Reason for Implanon removal (n=174)				
Husband objection	21(87)	3(13)	1	1
No husband	16(80)	4(20)	0.09(0.02-0.40)	0.06(0.01- 0.41)*
Husband go abroad	12(70.6)	5(29.4)	0.16(0.04-0.64)	0.26(0.05-1.49)
Desire for pregnancy	63(81)	15(19)	-	-
Women want go abroad	21(60)	14(40)	0.15(0.06-0.42)	0.09(0.02-0.39)*
Counseled on benefit of Implanon				
Yes	307(83)	65(17)	1	1
No	11(69)	5(31)	0.47(0.16-1.39)	1.07(0.08-13.78)
Age group of the women				
15-19	46(85.2)	8(14.8)	1	1
20-24	93(89)	8(11)	-	-
25-29	78(81)	18(19)	0.12(0.09-0.44)	0.15(0.03-0.86)*
30-34	60(78)	17(22)	0.37(0.18-0.77)	0.41(0.09-1.82)

Variable	Implanon Discontinuation		Crude OR 95% (C.I)	Adjusted OR 95% (CI)
	Yes (%)	No (%)		
≥ 35	37(62)	23(38)	0.46(0.22-0.96)	0.45(0.10-1.99)
Counseled on side effect				
Yes	261(84)	51(16)	1	1
No	57(75)	19(25)	0.59(0.32, 1.07)	0.96(0.23-4.01)
No of live children				
0-3 children	278(85)	48(15)	1	1
4-5 children	31(74)	11(26)	0.14(0.06, 0.36)	0.04(0.01-0.78)*
≥ 6 children	9(45)	11(55)	0.29(0.10, 0.89)	0.16(0.01-3.48)

*indicates significant association during multivariate analysis

4. Discussion

This study aimed to identify early implant discontinuation and associated factors among Implanon user women in Asella town. In this study, 83.7% of women with a mean duration of 19.98 ± 10.51 months discontinued Implanon early, which was higher than that reported in studies conducted in Ghana and Benin [15, 19]. This difference might be due to the time of the study, and another possible reason for the discrepancy might be the differences in demographic and socioeconomic status among the countries.

However, the findings of this study were greater than those of studies conducted in our country in different places, such as studies conducted in Mekelle city, Humera town and Debre Tabor city [7, 8, 6]. This discrepancy might be due to different reasons. One might be due to the educational status of the study participants, as the majority of women in the other studies were literate compared to those in the current study. Another possible reason might also be related to age. Because the women in the current study were younger than those in previous studies and because they were young, there was a high probability that they would desire to have more children, this led to a high discontinuation rate. The third reason might be inadequate preinsertion counseling, particularly about the expected side effects of the method. Finally, this might be due to the study setting, as the current study was conducted in urban areas, whereas the others were either in rural areas or both urban and rural areas.

On the other hand, the current finding was lower than that of previously community-based studies conducted in a buffalo city, where the early Implanon discontinuation rate was 94.4% [16]. This difference might be attributable to the economic difference in that mothers in this area could have better socioeconomic and educational status.

The results demonstrated that women who had no husband

were 0.06 times less likely to discontinue Implanon early (adjusted OR, 0.06, 95% CI: 0.01-0.41) than women who had a husband objection. This result was similar to those of studies performed in different parts of Ethiopia, such as Mekelle city [7], Humera town [8] and Debre Tabor town [6], and in West African counties, such as Benin [19], Senegal [14], and Ghana [15]. In addition women who needed to go abroad were 0.09 times less likely remove early the Implanon (adjusted OR, 0.09: 95% CI (0.02-0.39)) than those have husband objection. This may be although women with no husband and those needed to go abroad were both prevent the risk of becoming pregnant at any time without her need due to rape or/and women intend to have responsibility sharing to become pregnant and bear a child, the impact of the husband objection was more than these social and personal factors. On another hand it showed these two social factors (being with no husband and a need to go oversea) make less impact than the husbands' pressure or objections.

Women aged between 25 and 29 years were 0.15 times less likely to discontinue Implanon early (adjusted OR, 0.15: 95% CI (0.03-0.86)) than women in the 15-19 years age groups were. This result was congruent with that of a study performed in Mekelle city [7]. This may be because women in this age group need no more children as they might have enough earlier than the young (15-19) aged women.

Women who had a husband with at least a primary education level were 0.06 times less likely to discontinue Implanon early (adjusted OR, 0.06: 95% CI (0.01-0.56)) than women whose husband did not have at least a primary education level. This study was similar to studies conducted in Ethiopia, Mekelle city and Egypt [7, 11]. This may be because educated husbands are more aware of better health status and modern family planning than are non-educated husbands. This might indicate the husbands' knowledge increase the family planning proper sustained consumption.

Women who had between 4 and 5 children were 0.04 times less likely to discontinue early Implanon (adjusted OR, 0.04,

95% CI: 0.01-0.78) than women who had 0-3 children. This result was similar to those of studies conducted in urban Senegal and in our country in different parts, such as the Tigray region, Debre Tabor city, and Humara [3, 6, 8]. This may be because women who have fewer children are more likely to have more children that related the continued use with the family size already they have had. However, some evidence shows that the number of living children is not conclusive since in the context of other areas, no relation is observed [21].

Performing hundred percent response rates during the COVID-19 pandemic infection was considered strength of the study in addition to the use of primary data obtained directly from the considered subjects. However, there is a possibility of recall bias in the study: some of the respondents were unable to recall the various information concerning Implanon discontinuations well, and their age was considered. This was a cross-sectional study in which temporal relations could not be ascertained and the clients in the institution cannot fully represent the population of concern.

5. Conclusion

Based on these findings, the following conclusions can be drawn. In this study, a high (83.7%) proportion of women discontinued Implanon early. More than half of the women (64.9%) discontinued Implanon before two years, 30.7% discontinued Implanon before one year, and 8.5% discontinued Implanon before six months.

The major reasons for women who discontinued Implanon early were desire for more children (20.1%), husband's rejection (6.2%), no husband (5.2%), women going abroad (5.9%) and husbands going abroad (4.4%). Husbands' educational level, age of women, living children, parity, husbands and women going abroad were found to be significantly associated with early Implanon discontinuation, while religion, educational status of the mother, counseling on benefits and side effects, need to conceive in the near future and ethnicity were not found to be significantly associated with early Implanon discontinuation.

Based on the findings, the authors' recommendations were made to the concerned parties. Great effort should be made to address women's perceptions and understanding through mass media and health education programs to increase the continuation rate of Implanon use. Health care providers should also provide appropriate manual preinsertion counseling to clients by emphasizing side effects and banalities. Close monitoring and follow-up of Implanon users should be performed to increase the Implanon continuation rate, and further research should be conducted on large-scale sampling supported by qualitative data to identify determinants of early Implanon discontinuation.

Abbreviations

CI	Confidence Interval
DHS	Demographic Health Survey
HEP	Health Extension Package
HEW	Health Extension Worker
IUD	Intrauterine Device
LARC	Long Acting Reversible Contraceptive
OCP	Oral Contraceptive
OR	Odds Ratio
SPSS	Statistical Package for Social Sciences
STI	Sexually Transmitted Infection
TL	Tubal ligation

Declarations

Ethics Approval and Consent to Participate

Ethical approval was obtained from the research Ethical Institutional Review Board (IRB) of the Arsi University, College of Health Science. Support letters were obtained from the Arsi University College of Health Science to both the Arsi Zonal Health Office and the Asella Town Health Office. According to the Helsinki World Medical Association declaration the principles of research involving human subjects were applied as follows. Informed written consent was obtained from each study participant to confirm their willingness to participate after they explained the objectives of the study. Participation in the study was voluntary, and a study participant reported that she had the right to accept, refuse or quit participation at any time in the process. Confidentiality, dignity, privacy assured and personal details were recorded anonymously in any documentation related to this study. Since it was an exit interview, there was neither harm nor direct benefit from participation or refusal.

Consent for Publication

Not applicable.

Author Contributions

DGD and LTW both have participated in conception of the study, designing and data analysis and writing up. DGD processed the data acquisition and financial management. LTW has written the manuscript to the final status. DGD and LTW both read and approved the submission of the manuscript.

Damitu Gudina Defa: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing

Legesse Tadesse Wodajo: Conceptualization, Formal Analysis, Investigation, Methodology, Software, Validation,

Writing – original draft, Writing – review & editing

Funding

No special fund is received.

Data Availability Statement

All relevant data are included in the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] UNFPA. Long-Acting Reversible Contraception: Supply chain management unit. January 2022. <https://www.unfpa.org>
- [2] Haddad L, Wall KM, Vwalika B, Khu NH, Brill I, Kilembe W, et al. Contraceptive discontinuation and switching among couples receiving integrated HIV and family planning services in Lusaka, Zambia: AIDS. 2013 Oct; 27: S93–103. <https://doi.org/10.1097/QAD.0000000000000039>
- [3] Gebre-Egziabher D, Medhanyie AA, Alemayehu M, Tesfay FH. Prevalence and predictors of implanon utilization among women of reproductive age group in Tigray Region, Northern Ethiopia. *Reprod Health*. 2017; 14(1). <http://reproductive-health-journal.biomedcentral.com/articles/10.1186/s12978-017-0320-7>
- [4] Bhatia P, Nangia S, Aggarwal S, Tewari C. Implanon: Subdermal single rod contraceptive implant. *J Obstet Gynecol India*. 2011 Aug; 61(4): 422-5. <https://doi.org/10.1007/s13224-011-0066-z>
- [5] Nageso A, Gebretsadik A. Discontinuation rate of Implanon and its associated factors among women who ever used Implanon in Dale District, Southern Ethiopia. *BMC Women's Health*. 2018; 18(1). <https://doi.org/10.1186/s12905-018-0678-x>
- [6] Melkamu AM, 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 Jan 21; 2018: 3597487. <https://doi.org/10.1155/2018/3597487>
- [7] G/Medhin T, Gebrekidan KG, Nerea MK, Gerezegiher H, Haftu M. Early Implanon discontinuation rate and its associated factors in health institutions of Mekelle City, Tigray, Ethiopia 2016/17. *BMC Res Notes*. 2019 Jan 7; 12(1): 8. <https://doi.org/10.1186/s13104-018-3992-3>
- [8] Belete N, Zemene A, Hagos H, Yekoye A. Prevalence and factors associated with modern contraceptive discontinuation among reproductive age group women, a community based cross-sectional study in Humera town, northern Ethiopia. *BMC Women's Health*. 2018; 18(1). <https://doi.org/10.1186/s12905-018-0663-4>
- [9] Sarah EKB., Schwandt MH, Khan S. Levels, Trends, and Reasons for Contraceptive Discontinuation. DHS Analytical Studies No. 20. 2009, Calverton, Maryland, USA: ICF Macro.
- [10] Tadesse D, Medhin G, Kassie GM, Dadi TL, Tigabu S, Demissie M, Alemayehu M, Gerbaba MJ, Denberu BF, Teklu AM. Unmet need for family planning among rural married women in Ethiopia: What is the role of the health extension program in reducing unmet need? *Reprod Health*. 2022 Jan 21; 19(1): 15. <https://doi.org/10.1186/s12978-022-01324-x>
- [11] Grunloh DS, Casner T, Secura GM, Peipert JF, Madden T. Characteristics associated with discontinuation of long-acting reversible contraception within the first 6 months of use. *Obstet Gynecol*. 2013; 122(6): 1214-21. <https://doi.org/10.1097/01.AOG.0000435452.86108.59>
- [12] Tadesse A, Kondale M, Agedew E, Gebremeskel F, Boti N, Oumer B. Determinant of Implanon Discontinuation among Women Who Ever Used Implanon in Diguna Fango District, Wolayita Zone, Southern Ethiopia: A Community Based Case Control Study. *Int J Reprod Med*. 2017; 2017: 1–8. <https://doi.org/10.1155/2017/2861207>
- [13] Sznajder KK, Tomaszewski KS, Burke AE, Trent M. Incidence of Discontinuation of Long-Acting Reversible Contraception among Adolescent and Young Adult Women Served by an Urban Primary Care Clinic. *J Pediatr Adolesc Gynecol*. 2017 Feb; 30(1): 53-57. <https://doi.org/10.1016/j.jpag.2016.06.012>
- [14] Barden-O'Fallon J, Speizer IS, Calhoun LM, et al. Women's contraceptive discontinuation and switching behavior in urban Senegal, 2010–2015. *BMC Women's Health* 18, 35 (2018). <https://doi.org/10.1186/s12905-018-0529-9>
- [15] Gbagbo FY, Kayi EA. Use and discontinuation of intrauterine contraceptive device in the Greater Accra Region of Ghana. *Contracept Reprod Med*. 2018; 3(1). <https://contraceptionmedicine.biomedcentral.com/articles/10.1186/s40834-018-0061-1>
- [16] 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. <https://doi.org/10.29063/ajrh2018/v22i1.11>
- [17] Caglia J, Kearns A, Langer A. Health Extension workers in Ethiopia: Delivering community-based antenatal care. Country level programmes 2014. Women and Health Initiative /Maternal health Task Force. Harvard School of Public Health. August 2014. www.Womenandhealthinitiative.org
- [18] Allsworth JE, Secura GM, Zhao Q, Madden T, Peipert JF. The impact of emotional, physical, and sexual abuse on contraceptive method selection and discontinuation. *Am J Public Health*. 2013 Oct; 103(10): 1857-64. <https://doi.org/10.2105/AJPH.2013.301371>
- [19] Aisien AO, Enosolease ME. Safety, efficacy and acceptability of implanon a single rod implantable contraceptive (etonogestrel) in University of Benin Teaching Hospital. *Niger J Clin Pract*. 2010 Sep; 13(3): 331-5. <http://www.njcponline.com>

- [20] Kalmuss D, Davidson AR, Cushman LF, Heartwell S, Rulin M. Determinants of early implant discontinuation among low-income women. *Fam Plann Perspect*. 1996: 256–260. <https://www.guttmacher.org>
- [21] Mruts BK, Hagos S, Fantahun M. Early discontinuation of implanon and its associated factors among women who ever used implanon in Ofla District, Tigray, Northern Ethiopia. *Int J Pharma Sci Res*. 2015: 6(3): 544–551. <https://www.researchgate.net/publication/275342495>
- [22] Girum T, Wasie A. Return of fertility after discontinuation of contraception: a systematic review and meta-analysis. *Contracept Reprod Med*. 2018: 3(1): 9. <https://doi.org/10.1186/s40834-018-0064-y>
- [23] UNFPA. Federal Democratic Republic of Ethiopia Population Census Commission. Summary and Statistical Report of the 2007 Population and Housing Census: Population size by Sex and age. UNFPA, 2008, Addis Ababa, Ethiopia. <https://www.ethiopianreview.com/pdf/001/Cen2007.pdf>