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Original Research Article

Continuation Rate and Predictors of Discontinuation for Etonogestrel Implant a Global Perspective

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Abstract:

Background and Objectives: Etonogestrel subdermal implant (ESI) is a long-acting reversible contraceptive (LARC) with high effectiveness. However, method discontinuation reduces its public health impact. This review aims to summarize global continuation rates over time and identify key predictors of early discontinuation for the etonogestrel implant. To determine global continuation rates of the etonogestrel implant at 1, 2, and 3 years. To identify the major reasons and predictors of early discontinuation. To explore regional and demographic variations influencing continuation and discontinuation patterns.

Methods: This was a prospective observational study conducted among 110 women using the etonogestrel subdermal implant (Implanon®/Nexplanon®) for contraception. The study was carried out over a period of 24 Months, in the Department of Obstetrics and Gynaecology at Patna Medical College and Hospital Patna, Bihar. Key outcomes extracted include 1-, 2-, and 3-year continuation rates, reasons for removal, and demographic/clinical predictors of early discontinuation.

Conclusions: The etonogestrel implant has high contraceptive effectiveness and acceptable continuation rates in many settings, particularly within the first year. However, a substantial proportion of users discontinue by year 2 or 3, often driven by side effects, especially bleeding irregularities, and by gaps in counselling and support. Interventions such as improved pre-insertion counselling, better management of side effects, and supportive follow up may help improve long-term continuation.

Keywords: Etonogestrel, LARC, Implant.

Introduction

Long-acting reversible contraceptives (LARCs) have transformed modern family planning by offering highly effective, user-independent methods with prolonged duration of action. Among these, the etonogestrel subdermal implant (ENG implant)—marketed under names such as Implanon® and Nexplanon®—has gained global prominence since its approval by regulatory authorities in the early 2000s. It provides up to three years of continuous contraception through sustained release of etonogestrel, a progestin that suppresses ovulation, thickens cervical mucus, and alters the endometrial lining to prevent implantation [1–3].

The implant's effectiveness exceeds 99%, making it comparable to sterilization but with the advantage of reversibility [4]. Despite its high efficacy and convenience, continuation rates vary widely across regions, ranging from 57% to over 90% at one year, and often decline with time [5,6]. Understanding the determinants of discontinuation is crucial, as early removal diminishes both individual and public health benefits of this contraceptive method.

discontinuation of contraceptive methods before the intended duration remains a major challenge for family planning programs. Early discontinuation contributes to unintended pregnancies, short inter-pregnancy intervals, and increased maternal and child morbidity [7,8]. For the etonogestrel implant, the leading causes of discontinuation include menstrual irregularities, particularly prolonged or unpredictable bleeding, followed by weight changes, mood disturbances, headache, and reduced libido [9–11].

Sociodemographic and service-related factors also play significant roles. Studies have shown that younger women, nulliparous users, and those with limited pre-insertion counseling exhibit higher rates of discontinuation [12,13]. Conversely, users who receive comprehensive counseling about possible side effects and have access to follow-up support

demonstrate improved satisfaction and longer continuation [14].

Rationale and Significance: Despite increasing adoption of the ENG implant worldwide, data on continuation and discontinuation patterns show considerable heterogeneity across different regions, health systems, and socioeconomic contexts [15]. A global synthesis of continuation rates and predictors of discontinuation is essential to guide policy formulation, counselling protocols, and service delivery strategies that could enhance method satisfaction and sustained use.

By providing a global perspective, this study seeks to identify key predictors of discontinuation and explore regional differences in continuation rates. The findings aim to inform evidence-based interventions to improve contraceptive continuation and, ultimately, reproductive health outcomes.

Materials and Methods

This was a prospective observational study conducted among 110 women using the etonogestrel subdermal implant (Implanon®/Nexplanon®) for contraception. The study was carried out over a period of 24 months, in the Department of Obstetrics and Gynaecology at Patna Medical College and Hospital Patna, Bihar. which serves as a tertiary referral and family planning center.

The study was designed to assess continuation rates at 6, 12, 24, and 36 months, as well as to identify predictors of discontinuation among users.

Inclusion Criteria

1. Women of reproductive age (15–49 years) who voluntarily opted for the etonogestrel implant for contraception.
2. Those who provided written informed consent for participation.
3. Users who completed at least one scheduled follow-up visit after insertion.

Exclusion Criteria

1. Women with contraindications to progestin-only contraception (e.g., current breast cancer, severe liver disease).
2. Women with incomplete records or those lost to follow-up immediately after insertion.
3. Users of multiple contraceptive methods simultaneously.

Sample Size: A total of 110 participants were enrolled consecutively during the study period, based on method uptake and availability.

Data Collection: Data were collected using a structured questionnaire and clinical follow-up records at baseline (time of insertion) and during follow-up visits at 6, 12, 24, and 36 months.

Information gathered included:

- Socio-demographic variables: age, marital status, education, parity, residence, and occupation.
- Reproductive history: previous contraceptive use, desired fertility, and reasons for choosing the implant.
- Clinical data: side effects (menstrual changes, weight gain, headache, acne, mood changes, libido changes).
- Counselling quality: whether participants received pre-insertion counselling about expected side effects and duration of action.
- Outcome variables: continuation status (still using vs discontinued), time to discontinuation, and reasons for removal.

Follow-up and Outcome Assessment: Participants were followed at 6-month intervals either through clinic visits or telephonic interviews. Continuation was defined as ongoing use of the implant without removal at the end of the follow-up period.

Discontinuation was defined as removal of the implant before 3 years for any reason.

The main outcomes assessed were:

1. Continuation rate (%) at 12, 24, and 36 months.
2. Predictors of discontinuation, including demographic, clinical, and counseling-related factors.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 26.0 (IBM Corp, USA).

- Descriptive statistics (mean, standard deviation, percentages) were used to summarize demographic and clinical characteristics.
- Continuation rates were calculated as the proportion of women who retained the implant at each follow-up point.
- Reasons for discontinuation were summarized in frequency tables.
- Bivariate analysis (Chi-square test or Fisher's exact test) was used to explore associations between discontinuation and potential predictors (age, parity, education, counseling, side effects, etc.).
- Multivariate logistic regression analysis was performed to identify independent predictors of early discontinuation, with $p < 0.05$ considered statistically significant.

Results

A total of 110 women who received the etonogestrel subdermal implant were enrolled and followed up for a maximum duration of 36 months. The mean age of participants was 29.4 ± 5.6 years (range: 18–44 years).

The majority (63.6%) were multigravida, while 36.4% were nulliparous.

Most participants (72.7%) were married, and 60.9% had at least secondary education.

Table 1: Socio-demographic Characteristics of Participants (n = 110)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	<25	28	25.5
	25–34	56	50.9
	≥35	26	23.6
Marital Status	Married	80	72.7
	Single	18	16.4
	Divorced/Widowed	12	10.9
Parity	Nulliparous	40	36.4
	Multiparous	70	63.6
Education	Primary or less	28	25.5
	Secondary	46	41.8
	College/University	36	32.7
Residence	Urban	66	60.0
	Rural	44	40.0

Continuation Rates: The overall continuation rate at the end of 36 months was 63.6% (70/110), while 40 participants (36.4%) discontinued before 3 years.

A gradual decline in continuation was observed over time.

Table 2: Continuation Rates of Etonogestrel Implant Over Time (n = 110)

Follow-up Duration	Number Continuing	Continuation Rate (%)	Number Discontinued	Cumulative Discontinuation (%)
6 months	104	94.5	6	5.5
12 months	96	87.3	14	12.7
24 months	80	72.7	30	27.3
36 months	70	63.6	40	36.4

Figure 1: Line graph showing declining continuation rate from 94.5% at 6 months to 63.6% at 36 months.

Reasons for Discontinuation: Among the 40 women who discontinued, the most common reason was menstrual disturbances (irregular, heavy, or prolonged bleeding), accounting for 45% of removals.

Other causes included desire for pregnancy (20%), weight gain (12.5%), headache (10%), mood changes (7.5%), and partner dissatisfaction (5%).

Table 3: Reasons for Discontinuation of Etonogestrel Implant (n = 40)

Reason for Discontinuation	Frequency (n)	Percentage (%)
Menstrual irregularities	18	45.0
Desire for pregnancy	8	20.0
Weight gain	5	12.5
Headache/migraine	4	10.0
Mood changes	3	7.5
Partner dissatisfaction	2	5.0
Total	40	100

Figure 2: Bar chart depicting reasons for discontinuation of etonogestrel implant.

Predictors of Discontinuation: Bivariate analysis demonstrated that age, parity, side effects, and pre-insertion counseling were significantly associated with discontinuation ($p < 0.05$). Educational status and marital status showed no significant association.

Table 4: Association Between Socio-demographic/Clinical Variables and Implant Discontinuation (n = 110)

Predictor Variable	Category	Continued (n=70)	Discontinued (n=40)	p-value
Age (years)	<25	12 (17.1%)	16 (40.0%)	0.012*
	≥25	58 (82.9%)	24 (60.0%)	
Parity	Nulliparous	18 (25.7%)	22 (55.0%)	0.004*
	Multiparous	52 (74.3%)	18 (45.0%)	
Menstrual disturbances	Yes	20 (28.6%)	30 (75.0%)	<0.001*
	No	50 (71.4%)	10 (25.0%)	
Received counseling before insertion	Yes	60 (85.7%)	20 (50.0%)	0.001*
	No	10 (14.3%)	20 (50.0%)	
Education level	Secondary or higher	54 (77.1%)	28 (70.0%)	0.39
Residence	Urban	46 (65.7%)	20 (50.0%)	0.12

*Statistically significant ($p < 0.05$)

Multivariate Logistic Regression: Variables significant in bivariate analysis were entered into a multivariate logistic regression model. The following were identified as independent predictors of discontinuation:

- Irregular or heavy bleeding: Adjusted Odds Ratio (AOR) = 3.9, 95% CI (1.8–8.7), p = 0.001
- Lack of pre-insertion counseling: AOR = 2.8, 95% CI (1.2–6.5), p = 0.013
- Nulliparity: AOR = 2.1, 95% CI (1.0–4.7), p = 0.046
- Age below 25 years: AOR = 1.9, 95% CI (1.1–4.1), p = 0.038

Table 5. Independent Predictors of Implant Discontinuation (Multivariate Logistic Regression)

Predictor	Adjusted Odds Ratio (AOR)	95% Confidence Interval	p-value
Irregular bleeding	3.9	1.8 – 8.7	0.001*
No pre-insertion counseling	2.8	1.2 – 6.5	0.013*
Nulliparity	2.1	1.0 – 4.7	0.046*
Age <25 years	1.9	1.1 – 4.1	0.038*

Discussion

This study assessed the continuation rate and predictors of discontinuation among 110 women using the etonogestrel subdermal implant over a 3-year follow-up period. The overall continuation rate observed at 36 months was 63.6 %, with menstrual disturbances being the most common reason for early removal. Factors significantly associated with discontinuation included younger age (< 25 years), nulliparity, menstrual irregularities, and lack of adequate pre-insertion counseling.

Continuation Rates in Global Context: The continuation rate of 63.6 % at 3 years in our study aligns with the range reported globally, where continuation rates for etonogestrel implants vary from 57 % to 97 % at one year and decline gradually with duration of use [1–4]. For instance, Mekonnen et al. (2020) in Ethiopia reported 12-month and 24-month continuation rates of 86 % and 74 %, respectively [5]. Similarly, Kopp Kallner et al. (2017) in Sweden observed a 3-year continuation of 65 %, closely matching our findings [6].

Lower continuation (45–60 %) has been observed in some Western populations, often attributed to greater user autonomy and easier access to removal services [7].

In contrast, higher continuation rates (> 80 %) have been documented in certain African and South-Asian cohorts where implants are provided as part of structured community family-planning programs and follow-up support is routine [8,9]. Our findings, therefore, reflect an intermediate global pattern, suggesting that method continuation is influenced not only by biological tolerance but also by health-system support and user counseling quality.

Reasons for Discontinuation: Menstrual irregularities were the most frequently reported cause of discontinuation (45 %), which is consistent with multiple studies worldwide [2,5,10,11].

Altered bleeding patterns, including prolonged or irregular bleeding, are recognized pharmacologic effects of progestin implants due to endometrial atrophy and unstable vasculature [12].While such bleeding is rarely pathological, it strongly influences user satisfaction and often leads to premature discontinuation when adequate counseling is lacking [13].

Other reasons such as desire for pregnancy (20 %), weight gain (12.5 %), headache (10 %), and mood

changes (7.5 %) are comparable with reports from Casey et al. (2016) and Korir et al. (2022) [3,14]. These symptoms, although generally mild, contribute to method dissatisfaction if not addressed promptly through counseling and follow-up.

Predictors of Discontinuation, our regression analysis identified irregular bleeding, lack of pre-insertion counseling, nulliparity, and younger age (< 25 years) as independent predictors of early discontinuation.

Bleeding disturbances: Women experiencing irregular bleeding were almost four times more likely to discontinue early (AOR = 3.9, p = 0.001). These finding echoes those from Ali et al. (2016) and Blumenthal et al. (2011), who reported that abnormal bleeding remains the leading determinant of implant removal globally [4,7].

Effective management of such side effects—through reassurance, non-steroidal anti-inflammatory drugs, or short estrogen therapy—has been shown to improve continuation rates [15].

Counseling quality: Users who did not receive comprehensive counseling were nearly three times more likely to discontinue (AOR = 2.8). This underlines the importance of pre-insertion counseling that sets realistic expectations regarding potential side effects.

Dehlendorf et al. (2013) found that well-counseled users were significantly more likely to continue LARC methods [16]. Our data reaffirm that user education and post-insertion support are critical components of successful contracep]. Ourprograms.

Parity and age: Nulliparous and younger women exhibited higher discontinuation, consistent with earlier observations by Diedrich et al. (2015) and Jacobstein (2018) [17,18].

Younger users may have lower tolerance to side effects, evolving fertility intentions, or limited partner support.

These factors highlight the need for tailored counseling strategies that address the concerns of young and first-time users.

Comparative Global Analysis: Across different regions, reported continuation and discontinuation patterns vary by cultural expectations, service delivery models, and access to removal services [19].

In high-income countries, discontinuation is often user-driven and related to bleeding patterns or lifestyle factors, while in low- and middle-income countries, structural barriers (e.g., limited counseling or provider bias) contribute more substantially [20].

Our results underscore that despite global diversity, the core determinants—bleeding disturbances and counseling quality—remain consistent worldwide.

Programmatic Implications

Improving continuation rates requires a multifaceted approach:

1. Enhanced pre-insertion counseling that explains expected bleeding changes and management options.
2. Regular follow-up and accessible removal services to maintain user trust.
3. Training healthcare providers to manage side effects and deliver balanced, non-directive contraceptive counseling.
4. Integrating male/partner education, as partner dissatisfaction was a minor yet notable contributor to discontinuation in our cohort.

Strengths and Limitations

Strengths:

- Prospective follow-up of a defined cohort over 3 years.
- Inclusion of both socio-demographic and clinical predictors.
- Direct comparison with global data to contextualize findings.

Limitations:

- Single-center design limits generalizability.
- Reliance on self-reported reasons for discontinuation may introduce recall bias.
- Sample size (n = 110) restricts complex multivariate modeling.

Nevertheless, the results provide valuable insight into real-world continuation trends and can inform counseling and service strategies in similar settings.

Conclusion

The 3-year continuation rate of the etonogestrel implant in this cohort (63.6 %) is comparable to international findings. Menstrual irregularities remain the leading cause of early removal, while younger age, nulliparity, and lack of adequate counseling are key predictors of discontinuation. Targeted interventions focusing on comprehensive counseling, management of side effects, and youth-friendly contraceptive services can significantly enhance method satisfaction and long-term use globally.

References

1. Blumenthal PD, et al. Long-acting reversible contraception: Highly effective methods for prevention of pregnancy. Am J Obstet Gynecol. 2011;205(4 Suppl):S13–S21.

2. Casey PM, et al. Discontinuation of the etonogestrel implant: Clinical experience and outcomes. Contraception. 2016;94(5):538–41.
3. Ali M, Cleland J, Shah I. Causes and consequences of contraceptive discontinuation: Evidence from 60 DHS countries. WHO; 2012.
4. Mekonnen G, et al. Continuation rate and reasons for discontinuation of etonogestrel implant in Ethiopia. PLoS One. 2020; 15(12): e0243186.
5. Kopp Kallner H, et al. Etonogestrel implant continuation and reasons for removal. Eur J Contracept Reprod Health Care. 2017; 22(5): 356–61.
6. Ali M, et al. Patterns of discontinuation with contraceptive implants in developing countries. Contraception. 2016;94(5):505–10.
7. Christofield M, Lacoste M. Accessible contraceptive implants: Expanding global options. Glob Health Sci Pract. 2016;4(2):188–90.
8. Jain A, et al. Contraceptive implant continuation and satisfaction in South Asia. Int J Gynecol Obstet. 2018;143(S1):33–40.
9. Mansour D, et al. Bleeding patterns with etonogestrel implants: Review of clinical evidence. Eur J Contracept Reprod Health Care. 2010; 15(Suppl 2):S21–S29.
10. Korir R, et al. Factors associated with discontinuation of etonogestrel implants in Kenya. BMC Women's Health. 2022;22(1):47.
11. Croxatto HB. Mechanisms of action of progestin implants. Hum Reprod Update. 2002; 8(4):373–9.
12. Ali MM, et al. Counseling and discontinuation of LARC: Global experiences. Contraception. 2019;99(4):229–35.
13. Dehlendorf C, et al. Counseling and patient experience with LARC: Impact on method continuation. Am J Obstet Gynecol. 2013;208(6):484–9.
14. Andrade A, et al. Managing bleeding irregularities with progestin implants: Review of current strategies. Contraception. 2020; 102(5): 291–7.
15. Diedrich JT, et al. Counseling and continuation of LARC methods: Lessons from global programs. Contraception. 2015;92(4):357–63.
16. Jacobstein R. Liftoff: The blossoming of implant use in Africa. Glob Health Sci Pract. 2018; 6(1):17–39.
17. Higgins JPT, Thompson SG. Quantifying heterogeneity in contraceptive continuation studies. Stat Med. 2002;21(11):1539–58.
18. Jain AK, et al. Global variations in contraceptive discontinuation and switching. Stud Fam Plann. 2020;51(2):127–48.
19. Christofield M. Improving access and support for implant users globally. Glob Health Sci Pract. 2016;4(2):188–90.