

EARLY DISCONTINUATION OF IMPLANT AND ITS ASSOCIATED FACTORS AMONG WOMEN WHO EVER USED IMPLANT IN 2017/2018 IN HAWASSA HEALTH CENTERS, SOUTHERN ETHIOPIA, 2019

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Abstract:

Background: Contraceptive use plays an important role in reducing fertility; and at times contraceptive prevalence has been used to evaluate the effect of family planning programs. Quality of family planning services is an important determinant of contraceptive use because it is likely to affect contraceptive adoption and, more significantly, contraceptive continuation i.e. poor access to quality Family Planning services, high discontinuation rate and low motivation to use modern FP methods.

Objective: to assess early discontinuation of implant and to identify associated factors among women who ever used implant in 2017/2018 in Hawassa health centers, south Ethiopia, 2019

Methods: cross sectional study design with structured and pre tested questionnaires were administered for 292 women who ever used implant in 2017--2018 from June; to July 2019. All research group members were undertaking data collection. 292 women who ever used implant in 2017--2018 were selected by simple random sampling technique and the data was collected from the family planning registration book of each Health centers. The data were entered and cleaned in SPSS version 20 for analysis. Multivariate Logistic regression was used identify factors associated with early discontinuation rate of implant.

Result: Of the 244 who ever used implant in the last one year, the overall early implant discontinuation rate was (16%). The 39 women that had the implant removed had used implant for the duration of between 2 and 14 months with a mean of 6.6 ± 2.8 months. Almost all (97.4%) of the discontinuers had used implant only for duration of less than year, following for less than 6 months (53.8%) and 14 months (2.6%).

Conclusion Early implant discontinuation rate in this study is in a considerable number. In addition, significant number of women were also planned to discontinue before 3 years Socio demographic variable including religion, age, educational level, number of live birth and marital status have not been found to be significant Predictors of early Implant discontinuation.

Key words: implant, early discontinuation of implant, associated factors of early discontinuation of implant

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Introduction:

Quality of family planning services is an important determinant of contraceptive use

because it is likely to affect contraceptive adoption and, more significantly, contraceptive

continuation [Jain AK, 1989 and Bruce J, 1990].

Nigerian Demographic and Health Survey, 2008 indicated poor access to quality Family Planning services, high discontinuation rate and low motivation to use modern FP methods. Many experts believed implanon to have the higher continuation rates as compare to other methods of contraceptives but evidences from different studies indicated that implanon discontinuation rates within the first one year of use ranges from 2% in Nigeria to 23% in UK, Malaysia, Australia and Egypt [Harvey Caroline, Seib Charrlotte, and Lucke Jayne, 2009 and Agrawal Anjali and Robinson Christine, 2005] and despite well tolerance and cost effectiveness, many women discontinue implanon use within one year of initiating a method. The major reasons that women discontinue use of implanon method are side effects, and health concerns, and a desire to become pregnant. Menstrual disturbance is the most common reason side effect for discontinuation of implanon use. Other less frequent reasons also include, spouse disapproval, and switching to another method [Affandi B, 1998 - Lakha F and Glasier AF, 2006].

Use of less effective methods, infrequent use, and method discontinuation have an effect on the rate of unintended pregnancies. In different countries significant number of women becomes exposed to the risk of conception after discontinuation and accidental pregnancies that end in miscarriage, stillbirth or abortion [Belsey EM, 1988 - Frost JJ, Singh S, and Finer LB, 2007].

Unintended pregnancies have consequences and are becoming increasingly concentrated among minority and socioeconomically disadvantaged women. It has been suggested that providing counseling and support may be the most important way to help clients continue on implanon. Studies indicate that the discontinuation rate is significantly lower in women who received intensive structured counseling than in women who received basic information about the method, in spite of the fact that users report a significant incidence of side effects Belsey EM, 1988 [Mansour D, Korver T, and Marintcheva-Petrova M, 2008].

In a cross-sectional study in Zaria Nigeria, early Implanon discontinuation was 19% and 69% of removal reason was menstrual disruption [Harvey Caroline, Seib Charrlotte, and Lucke Jayne, 2009].

In a community based cross-sectional study at Ofla Tigray, early Implanon discontinuation was 16% with mean (\pm SD) of 6.6 ± 2.8 in months [Jain AK, 1989]. Implanon is an effective form of family planning. Contraceptive discontinuation is a worldwide incident and highly contributes substantially to unplanned pregnancies, unwanted births, and termination of pregnancies [Harvey Caroline, Seib Charrlotte, and Lucke Jayne, 2009].

In sub-Saharan Africa including Ethiopia, there are high population and reproductive health challenges, which are indicating higher maternal mortality, higher total fertility rate, and unintended pregnancies [Asnake Mengistu, et al., 2012].

When a woman discontinues the prevailing family planning methods in her body, she may become pregnant unintentionally. This unplanned pregnancy has impacts on larger family size and ultimately contributes to higher overall fertility rates and reflects the effectiveness of family planning program [Bruce J, 1990], which may have social and economic consequences [Astbury-Ward E, 2009].

When emphasis is given on possible side effect counseling, reassurance, and follow-up, duration of Implanon utilization and women's satisfaction would be increased. Implanon discontinuation rates are poorly documented in Africa [Central Statistical Authority and ICF International, Ethiopia Demographic and Health Survey 2011, 2012].

Apart from low utilization, early Implant discontinuation and its determinants among Implant user women in Ethiopia are not well studied. The purpose of this study was to assess early Implant discontinuation and identify its associated factors among Implant users at Hawassa town.

Subjects and Methods:

Study area and period

Hawassa city, which is 273 km away from Addis Ababa in the south. The Health centers, offers health services including maternal and child health services. Some of these are outpatient, TB/ leprosy, antenatal care, delivery, postnatal care, and family planning services (Hawassa city health office, unpublished). The number of implano users from July 8, 2017 to July 7, 2018 in 10 health centers of Hawassa city which was 6200 (Hawassa city health office, unpublished). The study will be conducted from June -July 2019

Study design

Cross-sectional study design was conducted from June -July 2019

Study population

The Women who ever used Implant in Hawassa health centers who are selected by simple random sampling technique and meet inclusion criteria

Inclusion and Exclusion criteria

Inclusion Criteria

Women who ever used Implant in Hawassa health centers Where their list found in the Family planning registration book of the respected Health institutions using complete documentation (health centers)

Exclusion criteria

Women who ever used Implant in Hawassa health centers who are not currently living in Hawassa city

Sample size and Sampling technique

Single population proportion formula was used to calculate a sample size, by using 23.4% expected magnitude of early discontinuation rate of implano (Discontinuation rate of Implanon and its associated factors among women who ever used Implanon in Dale District, Southern

Ethiopia) 10% Non-response rate were considered..

$$N = z^2 pq / d^2$$

Where $z = 1.96$ (at 95% confidence interval)

$P = 23.4\%$ (prevalence of premarital sex)

$$q = 1 - 0.234 = 0.766$$

$d = 0.05$ degree of accuracy or margin of error

Hence $N_i = z^2 pq / d^2$

$$N_i = (1.96)^2 (0.234) (0.766) / (0.05)^2 = 276$$

Since the population is $< 10,000$ ($N = 6200$) using correction formula

$$N = 276 / 1 + 276 / 6200 = 265$$

$$N_f = 265 + 10\%(265) = 292$$

Thus by adding 10% none response rate, the final sample size will be 292

The numbers of women who ever used implant in 2017/2018 in hawassa health centers is 6200 women and 292 women in five Hawassa health centers were selected by simple random sampling technique

Data collection procedures

A structured and pre- tested interview based questionnaire with both open ended and closed ended questions was used to collect the data. The questionnaire comprises socioeconomic and demographic, past contraception history and Knowledge on Implant, partner involvement, counseling status, future intention and Information specific to the use of Implant types of questions. Among the discontinuers, further information was sought regarding duration of Implant use and the reason for removal. The age, date of insertion and removal of implant was taken from family planning registration book the questionnaire was adopted from reviewing different literatures and scientific facts. Questionnaire was first prepared in English and translated to Amharic by local language speaker to make it understandable by the study participants and to check whether the translation was consistent with the English version. The questionnaire was back retranslated to English by another person.

Data quality assurance

All Group members of research were undertake data collection .Before the actual data collection,

the questionnaire was pre tested in 5 % (18 women) outside of five selected health centers in Hawassa town. Based on the pretest, necessary modification will be made on the questions and the data of the pretest will be excluded in the actual data analysis. The data was collected by taking the lists of the users from Family planning registration book of the respected health institutions. The data collectors were checking for completeness and consistency before leaving the interviewee.

The study participants were asked after the data collectors explained the purpose of the study and obtaining verbal consent from each respondent.

Data processing and analysis

After the data collection has finished, the data was entered and cleaned in SPSS version 20. The data was presented in tables and figures. Then, bivariate and multivariate analyses were done for the independent variables with the outcome variable (early implant discontinuation).

Operational definition

- (i) Contraceptive: an agent or device intended to prevent conception.
- (ii) Counseling: making the women aware of its long protection, side effects, and effectiveness of the method.
- (iii) Early Implanon discontinuation: removal of Implanon by health professionals before 2.5 years of utilization.
- (iv) Long acting reversible contraceptive: contraceptive methods which serve as 3-10 years but can be removed at any time.
- (v) Menstrual disruption: any deviation of a woman's regular menstrual cycle.

(vi) Unintended pregnancy: pregnancy without mother's plan.

(vii) Side effect: when the women develop at least one side effect after Implanon insertion like menstrual disruption, insertion arm pain, headache, acne, and others

Ethical considerations

Ethical clearance was obtained from research and ethical committee (REC) of Rift Valley University, department of midwifery. Permission for conducting the study will also be obtained from the Hawassa Health Bureau. Then official letter was written to each service delivery point. Information sheet that contains about the benefit and risk of participating of the respondents in this study with verbal informed consent was attached to each questionnaire to brief and obtain each study participant.

Results:

3.1 Socio demographic characteristics

A total of two hundred forty four (244) participants have responded to the questionnaires making a response rate of 83.36%. The age of study participants were between 16 and 45 years with the mean (+SD) age 26.9±6.9 years. More than half of the participants 168(68.9%) were married, 219(89.8%) Orthodox Christians and 199(81.6%) were farmer by occupation. One hundred eighty eight (77%) of the women had living children between one and nine at the time of insertion and 51 (20.9%) had history of abortion between one and three times with a mean (+SD) number of living children and mean of abortion history 3.03±1.9 and 1.4 ±0.6, respectively. More than half of the study participants 159 (65.2%) and more than three quarter of her husband's 116(79.1%) educational status were illiterate (Table 1).

3.1.1 Table 1: Socio demographic status of women who ever used implant in 2017/2018 in Hawassa city, southern Ethiopia, 2019 (n=292)

Characteristics		Number	%
Women's Age at the time of Implant insertion	<20	39	16.0
	20-24	53	21.7
	25-29	62	25.4
	30-34	45	18.4
	35+	45	18.4
Women's marital status	Married	168	68.9
	Others(Widowed, Single, Divorced)	76	31.1
Religion	Orthodox	219	89.8
	Muslim	25	10.2
Women's Educational status	Illiterate	159	65.2
	Primary	62	25.4
	Secondary	23	9.4
Husband's Educational status(n=168)	Illiterate	116	69.0
	Primary	36	21.5
	Secondary	16	9.5
History abortion	Yes	51	20.9
	No	193	79.1
Women's Occupation	Farmer	199	81.6
	Others(merchant,G.employee, Student)	45	18.4

Past Contraceptive history and Counseling status during Implant insertion.

One hundred sixty nine (69.3%) of participant have ever heard the any contraceptives before inserting Implant. Nine in ten women have ever heard about Injectable followed by Pills 105(62.1%) but only 73(43.2%) have ever heard about Implant.

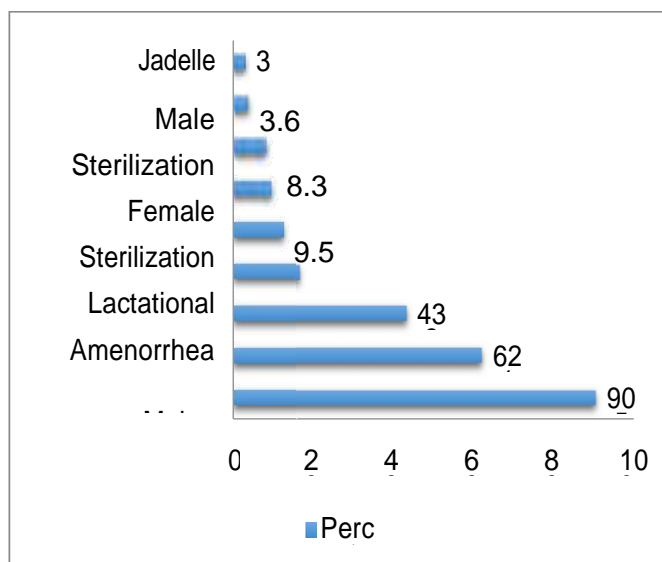


Figure 1.: Type of contraceptive which were known by women before inserting implant (n=169)

Among those who have ever heard about Implant (n=73) 55(75.3%) of the participants reported they know the benefit, 45(61.6%) its duration of action and 35(47.9%) its effectiveness. The main sources of information for the participants were Health care providers 137(81.1%) followed by mass media and Relatives &friends 38(22.5%), 29(17.2%) respectively each.

More than half of the participants, 143(58.6%), didn't use any type of modern contraceptive before inserting Implant (i.e. Implant was used for the first time).The rest 101(41.4%) had used modern methods of contraceptives, and were only switching over to Implant. pills and Injectables were the only two modern contraceptive which were used by the women in 18 (17.8%) and 83(82.2%) respectively.

Table 2: Past Contraceptive history, counseling status of women who ever used implant within last one year in 2017/2018 in Hawassa city, southern Ethiopia, 2019)

		Frequency	Percent
Information of ever heard about any contraception before using Implanon (n=244)	Ever heard	169	69.3
	Not ever heard	75	30.7
Type of information they know about implanon before inserting(n=169 , some clients had more than one response)	Benefit	55	75.3
	Duration of action	45	61.6
	Effectiveness	35	47.9
	Side effects	10	13.7
	Others	4	5.5
Ever used any contraceptive before using Implanon (n=244)	Yes	101	41.4
	No	143	58.6
Type of contraceptive they used before inserting Implanon (last method ,n =101)	Injectables	83	82.2
	Pills	18	17.8
Counseling service during inserting implanon	Yes	175	71.7
	No	69	28.3
Type of counseling (n=175)	Individual counseling	91	52.0
	With husband counseling	54	30.9
	Mass counseling	30	17.1
Type of information obtained during counseling(n=175, some clients had more than one response)	Benefit	145	59.4
	Effectiveness	94	38.5
	Duration of action	91	37.3
	Side effect	22	9.0
	Others	2	0.8

Early Implant Discontinuation

Of the 244 who ever used implant in the last one year, the overall early implant discontinuation rate was (16%). The 39 women that had the implant removed had used implant for the duration of between 2 and 14 months with a mean of 6.6±2.8 months. Almost all (97.4%) of the discontinuers had used implant only for duration of less than year, following for less than 6 months (53.8%) and 14 months (2.6%).

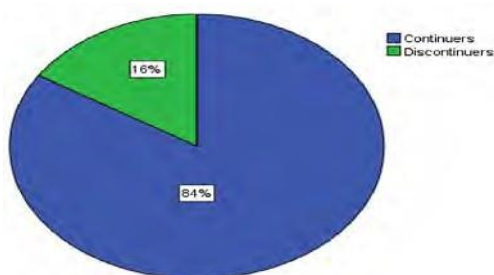


Figure 2: Number of who ever used implant in the last one year in 2017/2018 in Hawassa city , southern Ethiopia, 2019

Factors associated with Early Implant discontinuation

All the socio demographic factors and counseling relating factors were assessed for the presence of association with early discontinuation rate of implant in bivariate analysis .hence, counseling about benefit and effectiveness, place of insertion, experience of side effects, abnormal vaginal bleeding, weight gain, appointment for follow up and satisfaction by service were significantly associated with early discontinuation of implant in the bivariate binary logistic regression analysis but in the

multivariable binary logistic regression analysis showed that developing of side effect after the insertion of implant, appointment for follow up, and satisfaction by the service given during implant insertion were found to have statistically significant association with early discontinuation of implant but early discontinuation of Implant was not significantly related to age, marital status, parity, educational level, or socioeconomic variables.

The results demonstrated that Women who had developed side effects after inserting of implant (Adjusted Odds Ratio (AOR) = 2.79 [95%

CI: 1.10-7.07] who weren't appoint for follow up (AOR = 3.23 [95% CI: 1.17-8.93] and those women who weren't satisfy by the service given during the insertion of implant (AOR = 3.40[95% CI: 1.32-8.76] were more likely to have an early discontinuation of implant compared to Women who had not developed side effects, who were appoint for follow up and women who were satisfy by the service given during the insertion of implant

Table 3: Factors associated with early implant discontinuation among women who ever used implant in 2017/2018 in Hawassa city , southern Ethiopia, 2019

Variables	Continuation of implant		Crude OR (95 % C .I)	Adjusted OR (95% C.I)
	Yes (%)	No (%)		
Living children				
Yes	162(86.2)	26(13.8)	1	1
No	43(76.8)	13(23.2)	1.88(0.89-3.97)	1.61(0.67-3.88)
Counseling about benefit				
No		76(76.8)	23(23.2)	2.44(1.21-4.90)*
Yes		129(89.0)	16(11.0)	1
Counseling about effectiveness				
No		120(80)	30(20)	2.36(1.07-5.23)*
Yes		35(90.4)	9(9.6)	1
Place of insertion				
HC	117(80.7)		28(19.3)	1
HP	88(89.9)		11(11.1)	0.52(0.25-1.1)
Presence of side effects				
Yes		50(71.4)	20(28.6)	3.26(1.61-6.60)*
No		150(89.1)	19(10.9)	1
Abnormal vaginal bleeding				
No		180(86.1)	29(13.9)	1
Yes		25(71.4)	10(28.6)	2.48(1.08-5.70)*
Weight gain				
No		203(84.9)	36(15.1)	1
Yes		2(40)	3(60)	8.46(1.37-52.40)*
Headach				
No	167(85.6)		28(14.4)	1
Yes	38(77.6)		11(22.4)	1.73(0.79-3.77)
Appointment for follow up				
Yes	140(91.5)		13(8.5)	1
No	65(71.4)		26(28.6)	4.31(2.08-8.92)*
Satisfaction				
Yes	160(89.9)		18(10.1)	1
No	45(68.2)		21(31.8)	4.15(2.04-8.45)*

NB **=Statistical significant at $p < 0.05$

Discussion and Conclusion:

This study dealt with the discontinuation rate of implant among women who ever used implant using cross sectional study.

The early discontinuation rate of implant among women who ever used implant in last one year was 16% with a mean duration of 6.6 ± 2.8 months. This is higher than the studies conducted in Nigeria, Malaysia and Thailand [14, 26, 29, 31] but lower than the studies in Egypt, Australia, and UK [10, 13, 15] which were conducted in rural and urban setting. This could be because of due to different reasons. One might be due to the educational status of the study participant's as majority women in the other studies [14, 26, 29, 31] were literate compare to the current study. The other possible reason might also be due to age level. Because women of the current study were a younger age than the previous studies [14, 26, 29, 31] and being young has high probability desire to have more children which intern this leads to high discontinuation rate. The third reason might due to inadequate pre insertion counseling particularly about the expected side effects of the method. Finally, it might be due to study setting as the current study was conducted in rural whereas the others were either in urban or in both urban and rural. Main reasons cited by the women for early discontinuation of implant were Health concerns and side effects followed desire to have more children. The most common side effects of implanon were menstrual disruption and Headach. This is consistent with other studies conducted in Nigeria, Egypt, Thailand and Malaysia [15, 26, 28-29]. Although, menstrual disruption have no serious effects on health but can interfere with daily activities, especially interfere with their sexual relationships with their husbands. Women who had removed implant due to side effects could be because of to lack of prior information on the expected side effects of the method and intolerance of the side effects. Women with lack of prior information and had not used any form of contraception before may be also more concerned about vaginal bleeding and would want the implant removed in order not to interfere with their sexual relationships with their husbands. In a follow up study of

contraceptive discontinuation in Niger and the Gambia, researchers found that approximately 30% of family planning users discontinued use within the first eight months of acceptance, primarily because of side effects, spousal disapproval or a desire to become pregnant. The rate of discontinuation was higher among women who reported that they had not been adequately counseled about side effects [32]. Providing counseling about the possible side effects of the method and support by the service providers may be the most important way to help women continue on implant contraception. Husband's opposition of the method was the reason for discontinuation in 15.4% of the women. This is alarming and requires that the male involvement should be incorporated in counseling issues regarding the implant. As to the independent associated factors presence of side effects, appointment for follow up and satisfaction by the services during insertion of implant were the predictors of early discontinuation.

Women who have developed side effects after inserting implant were 2.79 times more likely to discontinue as compared to women who did not developed side effects which is similar with study conducted in Egypt [15]. This might be related to the fact that inadequate pre insertion counseling about the possible side effects during the insertion of implant by service providers and intolerance of the side effects of the method.

The odds of early discontinuation rate among those who didn't appoint for follow up were 3.23 times more than who appointed. This may be due to the inadequate pre insertion counseling on the expected side effects specific to implant

Lastly, Women who didn't satisfy by the service given during the insertion of implant were 3.40 times more likely to discontinue implant as compared to those who satisfied by the service given during insertion of implant. This is because women who were not interested by the method choice, privacy, explanation of the service provider and other service provision during insertion of implant may remove their method early.

The study did not assure causality due to the nature of the design. Besides, there a question of

inference as some of the women who ever used implant in 2017/2018 outside of the Hawassa city was excluded from the study

In conclusion, Early implant discontinuation rate in this study is in a considerable number. In addition, significant amount of women were also planned to discontinue before 3 years. The main reasons for early discontinuation of implant were Health concerns, desire to have more children and side effects. Generally, more than 90% of the causes of early implant discontinuation were related to unsatisfactory quality of counseling (side effects, desire for pregnancy, desire to use another method) .Women who have developed side effects during using of implant, women who didn't appointed for follow up and women who didn't satisfied by the service given during the implant insertion were the predictors of early implant discontinuation.

Socio demographic variable including religion, age, educational level, number of live birth and marital status have not been found to be significant Predictors of early Implant discontinuation

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References:

- [1.] Astbury-Ward E, 2009 Provision of contraception and its influence on abortion. *Nursing in Practice*,47.
- [2.] Asnake Mengistu, et al., 2012 Addressing Unmet Need for Long Acting Family Planning in Ethiopia: Uptake of Implanon and Characteristics of Users. *Pathfinder international*,
- [3.] Agrawal Anjali and Robinson Christine, 2005 An assessment of the first 3 years' use of Implanon® in Luton. *J Fam Plann Reprod Health Care*. 31(4): p. 310-312.
- [4.] Affandi B, 1998 An integrated analysis of vaginal bleeding patterns in clinical trials of Implanon. *Contraception*,. 58(6 Suppl): p. 99S-107S.
- [5.] Burusie, 2015. "Reasons for premature removal of implanon among users in arsi zone," *Reproductive System & Sexual Disorders*, vol. 4, no. 1, p. 6,
- [6.] Bitzer J, Tschudin S, and Alder J, 2004 Acceptability and side-effects of Implanon in Switzerland: A retrospective study by the Implanon Swiss Study Group. *Eur J Contracept Reprod Health Care*,. 9: p. 278-84.
- [7.] Bruce J, 1990 Fundamental elements of the quality of care: a simple framework *Stud Fam Plann*,. 21(2): p. 61-91.
- [8.] Belsey EM, 1988 The association between vaginal bleeding patterns and reasons for discontinuation of contraceptive use *Contraception*,. 38(2): p. 207-25.
- [9.] Carl H and Mary MK, . 2008. *World Population Data Sheet* P.R. Bureau, Editor
- [10.] Central Statistical Authority and ICF International, *Ethiopia Demographic and Health Survey 2011* ,. 2012: Addis Ababa, Ethiopia
- [11.] Croxatto HB, et al., 1999 A multicentre efficacy and safety study of the single contraceptive implant Implanon. *Implanon Study Group. Hum Reprod*,. 14(4): p. 976-81.
- [12.] Chaovisitsaree Somsak, et al., 2005 One Year Study of Implanon on the Adverse Events and Discontinuation. *J Med Assoc Thai*. 88(33): p. 314-317.
- [13.] Frost JJ, Singh S, and Finer LB, 2007 U.S. women's one-year contraceptive-use patterns ,2004 *Perspect Sex Reprod Health*,: p. 38-55.
- [14.] Harbison Sarah and Adetunji Jacob, 2009 *Contraceptive Choice and Discontinuation in Selected African Countries: A Focus on Injectables*, in *International Population Conference: Marrakesh, Morocco*.

- [15.] Harvey Caroline, Seib Charrlotte, and Lucke Jayne, 2009 Continuation rates and reasons for removal among Implanon® users accessing two family planning clinics in Queensland, Australia. *Contraception*..
- [16.] Jain AK, 1989 Fertility reduction and the quality of family planning services. . *Stud Fam Plann*., 20(1): p. 1-16
- [17.] K. Birhane, S. Hagos, and M. Fantahun, 2015 “Early discontinuation of implanon and its associated factors among women who ever used implanon in Ofla District, Tigray, Northern Ethiopia,” *International Journal of Pharma Sciences and Research*, vol. 6, no. 3, 8 pages,
- [18.] Lakha F and Glasier AF, 2006 Continuation rates of Implanon in the UK: data from an observational study in a clinical setting *Contraception*. 74(4): p. 287-9
- [19.] Lesley Hoggart, Victoria Newton, and Jane Dickson, April,2013 Understanding Long-Acting Reversible Contraception: An In-Depth Investigation into Sub-Dermal Contraceptive Implant Removal Amongst Young Women in London., University of Greenwich.
- [20.] Mutihir j.t and Nyango d.d., 2010 Indications for removal of etonogestrel implant within two years of use in Jos, Nigeria. *East African Medical Journal* November. 87 p. 11
- [21.] Mutihir JT and Nyango DD, 2010 One-year experience with implanon sub-dermal implants in Jos, Nigeria. *Nigerian Journal of Clinical Practice*, March. 13(1): p. 28-31.
- [22.] Mutihir JT and Daru PH, 2008 Implanon sub-dermal implants: a 10-month review of acceptability in Jos, North-Central Nigeria. *Nigerian Journal of Clinical Practice*., 11(4): p. 320-323.
- [23.] Makareinen . L, 1998 Ovarian function during the use if a single contraceptive implant: Implanon® compared with Norplant Fertility and Sterility,. 69: p. 714-721..
- [24.] Mastor Asmah, Khaing si Lay, and Omar siti Zawiah, 2011 Users’ perspectives on implanon in Malaysia,a multicultural Asian country. *Open Access Journal of Contraception*., 2: p. 79-84.
- [25.] Mansour D, Korver T, and Marintcheva-Petrova M, 2008 The effects of Implanon on menstrual bleeding patterns. *Eur J Contracept Reprod Health Care*., 13(1): p. 13-28.
- [26.] Mohamed Abdel-Razik Madiha Said, December,2012 Implanon Use Pattern among Ministry of Health and Population Clients 2008-2012., Faculty of Medicine,Cairo University: Cairo..
- [27.] Ojule J. D, Oranu E.O, and Enyindah C.E, 2012 Experience with Implanon in Southern Nigeria. *Journal of Medicine and Medical Sciences*. 3(11): p. 710-714. Organon, 2005 Design and Composition of Implanon, in *Implanon Product Monograph*., Organon
- [28.] Peipert Jeffrey F, et al., 2011 May Continuation and Satisfaction of Reversible RamaRao Saumya, et al., 2003 The Link Between Quality of Care and Contraceptive Use. *International Family Planning Perspectives*., 29(2): p. 76-83. *Contraception. Obstet Gynecol*. , 117 (5): p. 1105-1113
- [29.] Rhoda S, et al., 2009 Family Planning Saves Lives., Population Reference Bureau Mary A. Fischer, 2008 Implanon: A New Contraceptive Implant. 37: p. 361-368.
- [30.] Smith Amanda and Reuter Simone, 2002 An assessment of the use of Implanon® in three community services. *The Journal of Family Planning and Reproductive Health Care*. 28(4): p. 193-196.
- [31.] Sergent F, et al., 2004 Acceptability of the etonogestrel-containing contraceptive implant (Implanon). [French]. *J Gynecol Obstet Biol Reprod*., 33: p. 407-15.

