



Modern Contraceptive Use and Associated Factors During Extended Postpartum Period Among Women Who Gave Birth in the Last 12 Months at Northwest Ethiopia

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Background: The extended postpartum period is a one-year follow-up period after giving birth, and it is critical for women to prevent unintended pregnancy and reduce the risk of maternal and child mortality by ensuring safe birth intervals. Many women, however, are unaware that they are at risk for pregnancy throughout this period. Hence, the aim of this study was to assess the utilization and associated factors of modern contraceptives during extended postpartum family planning (EPPP) in northwest Ethiopia.

Methods: A community-based cross-sectional study design was conducted using 630 samples from October 01 to October 30, 2020, in northwest Ethiopia. The study participants were drawn through a multistage sampling technique and data were collected using structured questionnaires via interview. The collected data were entered into EpiData version 4.2 and exported into SPSS version 25.0 for management and further analysis. A bivariable logistic regression model was used to identify variables having an association with the outcome variable. In bivariable analysis, variables having $P \leq 0.25$ were selected and entered into multivariable logistic regression analysis. Finally, in multivariable analysis, variables having $P \leq 0.05$ with a 95% CI were declared as significantly associated with the outcome variable.

Results: About 60.6% of women were using modern contraceptive during extended postpartum period. Mothers to partner discussion (AOR= 7.6, 95% CI: 4.20–14.05), secondary educational status (AOR= 3.8, 95% CI: 1.36–10.93), college and above educational status (AOR= 7, 95% CI: 1.92–25.57), menstrual resumption (AOR= 9.2, 95% CI: 5.66–15.12), sex resumed (AOR=8.5, 95% CI: 2.19–33.58), fertility desire (AOR= 3.9, 95% CI: 1.99–6.15), linkage to FP during child immunization (AOR= 2.7, 95% CI: 1.67–4.50), and FP counseling during pregnancy (AOR=2, 95% CI: 1.25–3.34) were significantly associated with outcome variable.

Conclusion: Associating factors were identified as partner discussion, education, menstrual resumption, fertility desire, sexual resumption, FP counseling, and FP during child immunization. Improving mothers' education and informing couples about the dangers of becoming pregnant before menstruation are critical.

Keywords: postpartum, modern contraceptive, utilization, reproductive age, Ethiopia

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Background

Postpartum family planning (PFP) is a means of preventing unintended pregnancy and closely spaced pregnancies for one year following childbirth.¹ The World Health Organization (WHO) recommends that after giving birth, a woman stay for at least

two years before having another child to avoid the risks of maternal, prenatal, and infant health.²

According to the Global Burden of Disease study, there are 265 million unwanted pregnancies, 110 million unnecessary abortions, 590,000 avoidable maternal deaths, and 8 million preventable infant deaths worldwide, with developing countries accounting for 99% of maternal deaths.^{3,4} Women account for 69% of the unmet need for modern contraception in three regions (Sub-Saharan Africa (SSA), South Central Asia, and South East Asia), with 49 million unintended pregnancies accounting for 21 and 15 million induced abortions and the loss of healthy years of women's lives, respectively.⁵

The total contraceptive prevalence rate (CPR) for currently married women aged 15–49 years in Ethiopia is 42% (41% using modern methods and 1% using traditional methods).⁶ Although the recommended time for initiation of contraceptives in the postpartum period is 6 weeks after delivery, most women do not receive contraceptives as recommended.⁷

Most women start sexual activity without using contraceptive methods, although more than 90% of them want to postpone a future pregnancy in the first year of postpartum period.¹ As a result of low use of modern contraceptives, high rates of unintended pregnancies, unsafe abortions and unplanned births occur in the SSA.⁸ The risk of low birth weight is doubled if pregnancy occurs less than six months after previous delivery and children who are born less than two years previous birth.⁹

Shorter birth intervals are associated with an increased risk of negative maternal, perinatal, infant, and child health outcomes, which can prevent approximately 33% and 10% of maternal and under-five child deaths, respectively.^{10–12} FP improves the health and social outcomes of women and families, as well as the environmental benefits at different levels.¹³

Maternal mortality related to pregnancy and child birth complications in Ethiopia is the highest among SSA countries and it represents about 412 per 100,000 live births.⁷ The unmet need for postpartum family planning in Ethiopia is still high, ranging from 86% in the first 5 months to 76% by the end of the first year after delivery and 81% of women do not use PPF due to not realizing they could get pregnant one year after delivery.^{14,15}

Resumption of menses, limited knowledge of available choices, confusion when fertility comes back and unpredictability of the timing of the onset of intercourse, and not discussing family planning methods with partners, were the factors identified by previous studies.^{16,17}

Improving contraceptive counseling efforts may be one strategy to prevent adverse pregnancy outcomes and unsafe abortion among young women, reduce risks of maternal mortality, and promote achieving reproductive rights.¹⁸ So, to enhance postpartum utilization of contraceptives, health education at home or community level, counseling, provision of the full range of family planning methods and treatment of medical conditions and side effects should be considered.¹⁹ The introduction of modern contraceptives during the postpartum period is very crucial, yet less emphasis is given on the first year after birth. Therefore, this study aimed to assess extended postpartum period modern contraceptive methods' utilization and identify the factors affecting their utilization.

Materials and Methods

Study Design, Area and Period

A community-based cross-sectional study was conducted from October 01, 2020, to October 30, 2020, in Goncha Siso Enese, which is one of the districts in the Amhara Regional State of Ethiopia. The district is located 335 kms from Addis Ababa, the capital city of Ethiopia, 154 kms from Bahir Dar, the capital city of Amhara regional state, and 159 kms from Debre Markos, the administrative city of the East Gojjam Zone. The current total population of Goncha Siso Enese District is 211,894, of which 106,159 are women of reproductive age, and estimated live births are 5007 (23.6%) and 7141 (3.37%) respectively. There are 8 health centers, 8 private clinics, and 5 pharmacies providing maternal and other health services to the population.

Populations

All reproductive age (18–49) women who gave birth in the previous year were the source population, and all reproductive age women who gave birth in the previous year and lived in randomly selected Kebeles in the district were the study population.

Sample Size Determination and Sampling Procedures

A single population proportion formula was used to get the minimum required sample size using the following assumption and information: 95% CI, 5% margin of error, and prevalence of EPPP modern contraceptive ($P=46.7\%$),²⁰ 1.5 design effect,^{21,22} and adding 10% non-response rate, was calculated and the final sample size for this study was 630.

Of the total of 43 (Rural 41, Urban 2) Kebeles in the district, 13 Kebeles (12 rural, 1 urban Kebeles) were selected through a lottery and a simple random sampling method. The study participants were drawn via a multistage sampling technique. Health extension workers in each country compiled a list of mothers who gave birth in the previous 12 months. Before data collection, the sampling frame was designed by numbering the list of households using the registration book. When there are two or more eligible women in the same household, the lottery method is used to select one of them, and if the selected postpartum woman is absent at the time of data collection, the data collector is returned the following time. When the interviewer was unable to find the woman for a second time, the next postpartum woman was included in the study (Figures 1 and 2).

Variables

Dependent Variables

Extended postpartum period modern contraceptive utilization.

Independent Variables

Age, educational status, marital status, religion, occupation, income, and discussion with husband are socio-demographic characteristics. Contact with health care professionals (ANC, FP counseling during pregnancy, PNC, place of delivery, link to family planning during child immunization); knowledge of FP (awareness of contraceptive use after birth, source of knowledge, source of FP, benefit of FP); and reproductive health-related characteristics (sexual resumption, menstrual resumption, fertility

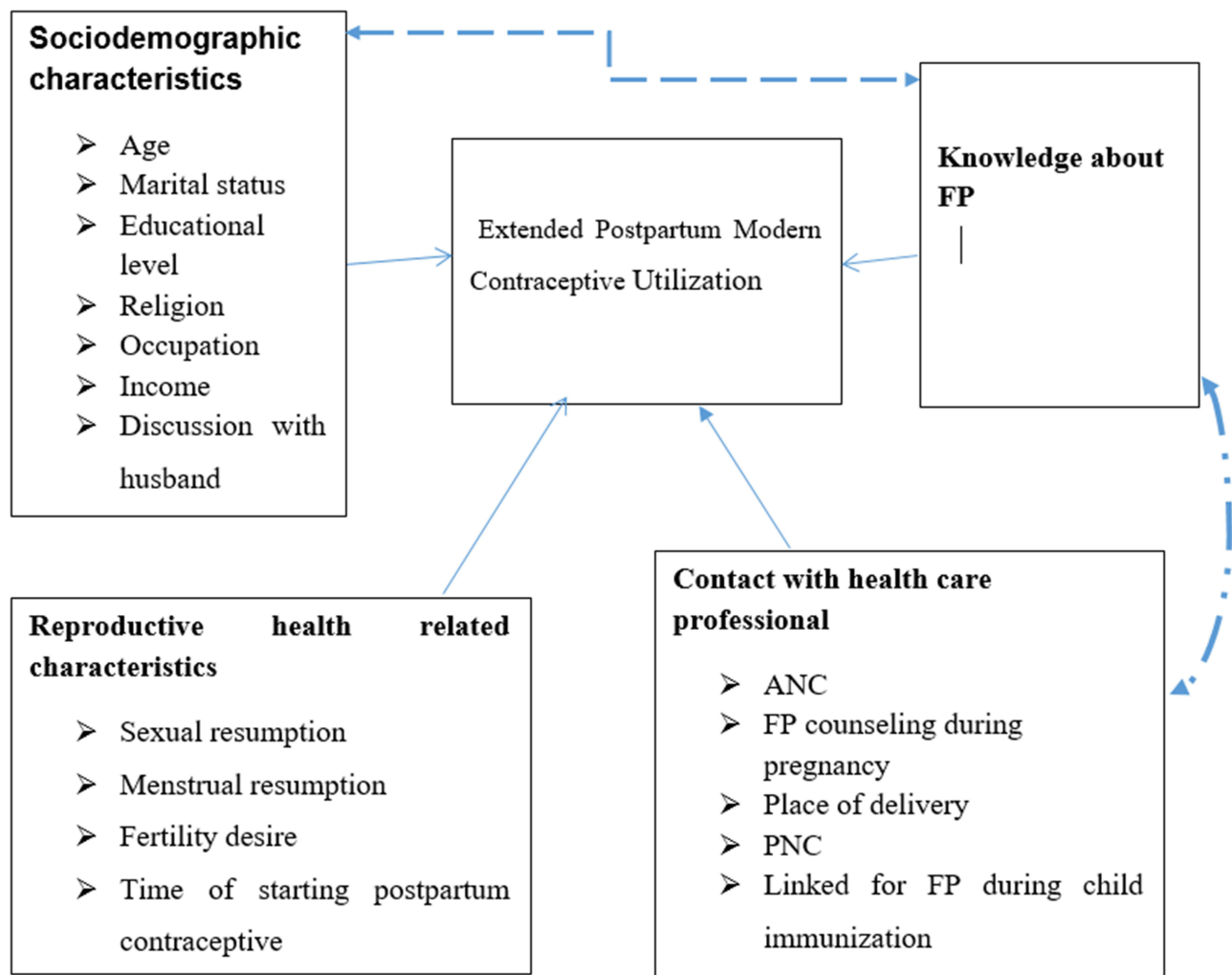


Figure 1 Conceptual framework for study done on EPPP modern contraceptive utilization and its associated factors among reproductive age women in Goncha Siso Enesie district, East Gojjam Zone, Ethiopia, 2020.

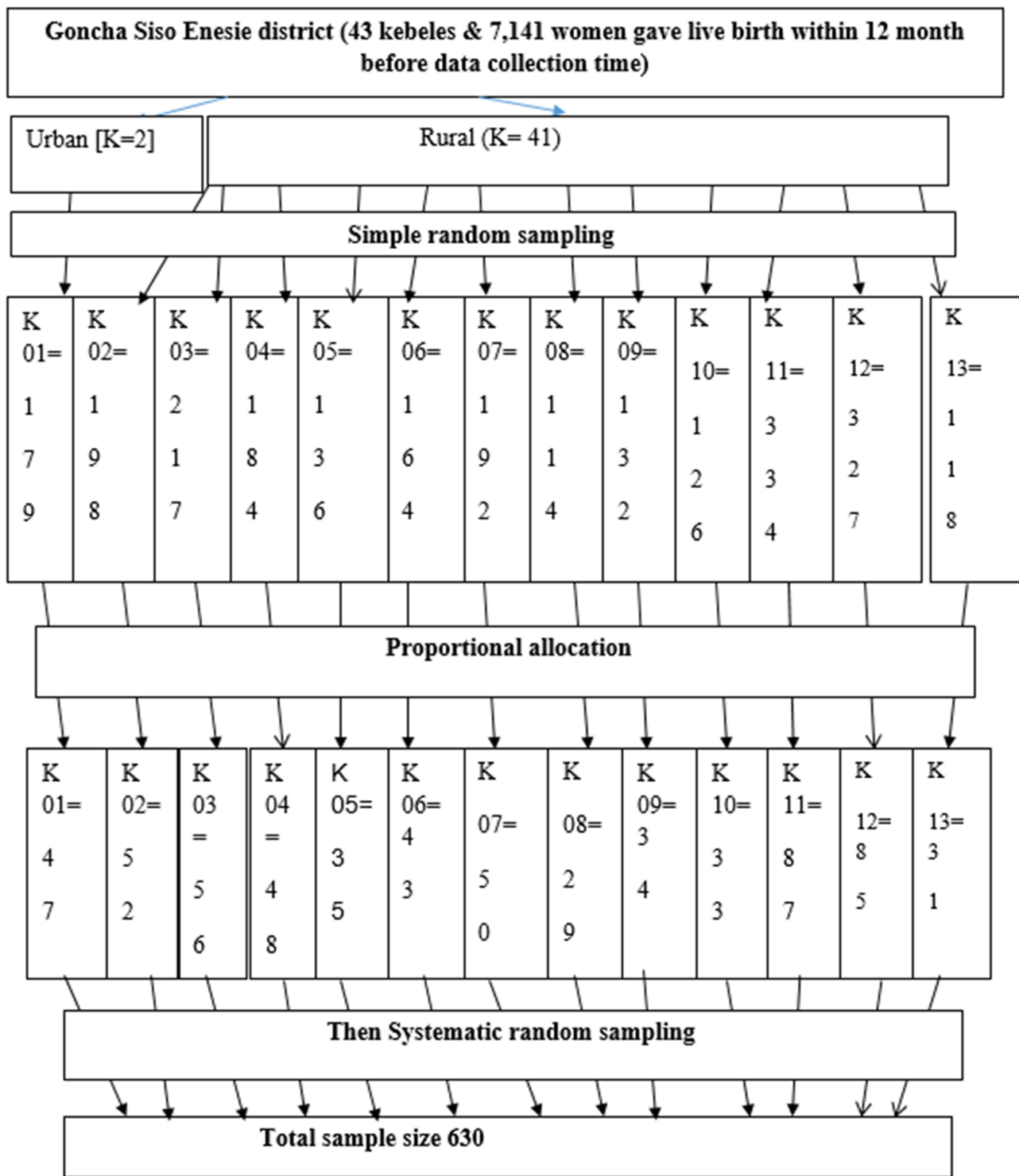


Figure 2 Schematic representation of the sampling procedure among extended postpartum women in Goncha Siso Enesie district, East Gojjam Zone, Ethiopia, 2020 (“K” stands for kebele).

desire, time of starting a postpartum period, time of starting a postpartum period, time of starting a postpartum contraceptive).

Operational Definitions

Extended Postpartum Modern Contraceptive Utilization

When a postpartum woman's currently use of any modern contraception methods (pill, IUD, injectable, condom (male or female), sterilization (male or female), implants during the 12 months following her most recent childbirth.²³

Extended Postpartum Period

The 12 month period after a live birth.²³

Menstrual Resumption

Women who started to see menstruation after birth during data collection time within one year.¹⁵

Knowledge of Family Planning

A women was considered as "knowledgeable about family planning by using 10 question, if a respondent answered mean score and above from knowledge-related questions" and "below mean score had poor knowledge".²⁴

Modern Contraceptive

It includes male and female sterilization, intrauterine devices (IUCDs), implants, injections, pills, emergency contraception, vaginal barriers, and mechanical male and female condoms.

Traditional Contraceptive (Natural Methods)

It includes withdrawal, rhythm (periodic abstinence), and the lactational amenorrhea method (LAM).

Data Collection Tools and Procedure and Quality Control

The data were collected using a pre-tested structured questionnaire via face-to-face interviewer administration. To maintain consistency, the questionnaire was prepared first in the English language and translated to Amharic (local language translated back to English by language experts.

About eight diploma clinical nurses women and two public health officers were recruited as data collectors and supervisors respectively. To keep data quality, one-day training was given to the data collectors and supervisors on the objective, confidentiality of information, respondent rights, and the techniques of interview, and close supervision of the data collectors and pre-tested was made. The

collected data was checked for completeness and consistency by the principal investigator to ensure the quality of the data every day.

Data Management and Analysis

The collected data was entered into the computer software EpiData version 4.2 by the principal investigator, then exported to SPSS version 25.0 for further management and analysis. To describe the study population in relation to the relevant variables, descriptive statistics such as frequencies, percentages, meaning, and standard deviation were computed based on the distribution and nature of the variables. Bivariable and multivariable logistic analysis was executed to identify associated factors with EPPP modern contraceptive utilization. In bivariable analysis, variables having $p < 0.25$ were recruited as candidates for multivariable analysis. In multivariable logistic analysis, variables having $P < 0.05$ were declared as significantly associated with modern contraceptive utilization during the extended postpartum period.

Results

Sociodemographic Characteristics of the Study Population

The response rate for this study was 98.2%. The mean age of the respondents was 30.28 years (± 5.82 SD) with an 18–49 range of years. One-third of those polled (18.2%) were between the ages of 25 and 29. When it comes to ethnicity, they all belong to the Amhara ethnic group and are Orthodox Christians. About 580 (99.7%) were married, and 545 (8.88%) were housewives. Regarding their educational status, 246 (39.7%) of them had no formal education. Only about 450 (72.7%) had conversations with their husbands, and only 36 (5.8%) worked for the government (Table 1).

Reproduction Preference and Characteristics of Study Population

The majority of 537 (86.8%) respondents said their recent pregnancy was planned, 307 (49.6%) said they wanted to have their next child in two years, and 94 (15.2%) said they did not want to have any more children. On the other hand, 353 (57%) of the respondents' menstruation had returned and 574 (92.7%) of those had resumed sex after delivery (Table 2).

Table 1 Socio-Demographic Characteristics of Women in the Extended Postpartum Period in Goncha Siso Enese District, Ethiopia, 2020 (N= 619)

Variables	Category	N (%)
	18–24	107(17.3)
	25–29	181(29.2)
	30–34	171(27.6)
	≥35	160(25.8)
Marital status of the respondents	Single	15(2.4)
	Married	580(93.7)
	Divorced	24(3.9)
Educational status of husband	Illiterate	246(39.7)
	Read and write	158(25.5)
	Primary (1–8)	84(13.6)
	Secondary (9–12)	47(7.6)
	College & above	45(3.9)
Husbands occupation	Farmer	483(78)
	Merchant	53(8.6)
	Government employee	44(7.1)
Discussion with husbands	Yes	450(72.7)
	No	130(21)
Educational status of respondents	Illiterate	383(61.9)
	Read and write	65(10.5)
	Primary(1–8)	93(15)
	Secondary (9–12)	38(6.1)
	College & above	40(6.5)
Respondents occupation	House wife	545(88)
	Government employee	36(5.8)
	Merchant	22(3.5)
	Daily labor	16(2.6)
Average monthly income in Ethiopian Birr	≤ 600	39(6.3)
	601–1000	32(5.2)
	1001–2000	129(20.8)
	≥ 2001	419(67.7)

Contraceptive Use During the Extended Postpartum Period

In this study, 375 (60.6%; 95% CI: 57–64%) of women used contraceptive methods in the extended postpartum period. Among those who used a contraceptive method, 292 (47.2%) began using it >3 months after childbirth, while 83 (22.1%) began using it after 3 months of childbirth. Within one year of delivery, the most commonly used methods were injectables (329) and implants (36) (0.8%). The majority of methods were obtained from the government

Table 2 Reproductive History and Preference of Women in Goncha Siso Enese District, Ethiopia, 2020

Variables	Category	N (%)
Planned delivery	Yes	537(86.8)
	No	82(13.2)
Fertility desire	Spacer or after two years	307(49.6)
	Limiting or no more children	94(15.2)
	Not decided	218(35.2)
Menstrual resumption	Yes	353(57)
	No	266(43)
Period of menses resumed in reference to date of child birth in months	≤ 3	208(33.6)
	4–6	134(21.6)
	≥ 7	11(1.7)
Started sexual intercourse after recent child birth	Yes	574(92.7)
	No	45(7.3)
Time of first sexual intercourse after recent child birth in month	≤3	534(86.3)
	4–6	40(6.5)
Modern contraceptive started after child birth	Yes	375(60.6)
	No	244(39.4)
Time of contraceptive used after child birth in month	≤1–3	292(47.2)
	4–6	73 (11.8)
	≥7	10(1.6)

health institute (366 (59.1%) and a private clinic (9 [1.5%]) (Figure 3). The main reason for non-use of contraceptive method in the EPPP was feeling not susceptible to pregnancy 107 (17.3%) followed by feeling of not at risk due to amenorrhea 90 (14.5%), pregnancy due to breast feeding 28 (4.5%), fear of side effect 19[3.1%]) (Figure 4).

Postpartum Women Knowledge on Contraceptive Methods

About 481 (77.7%) of the study participants had good knowledge. Whereas, 138 (22.3%) of the respondents had poor knowledge on postpartum contraceptive utilizations (Table 3).

Having Information About Postpartum Women on Contraceptive Methods

Among all women, five hundred eighty two (94%) of the respondents had information about modern contraceptive methods and knew at least one modern contraceptive method.

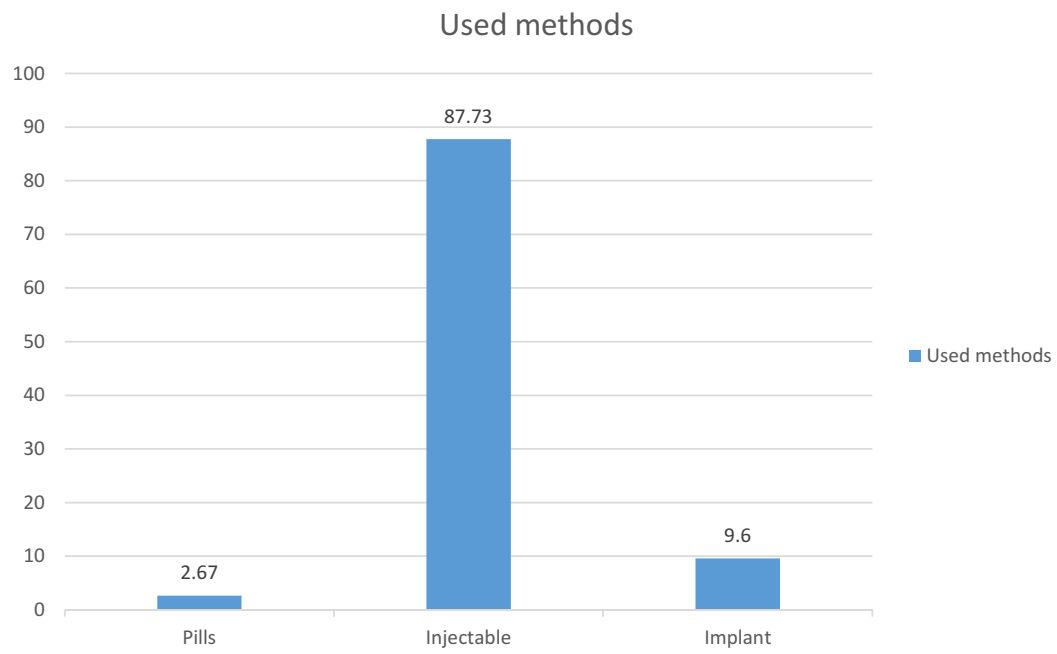


Figure 3 The most commonly used modern contraceptive methods in the EPPP, in Goncha Siso Enesie district, East Gojjam Zone, Ethiopia, 2020.

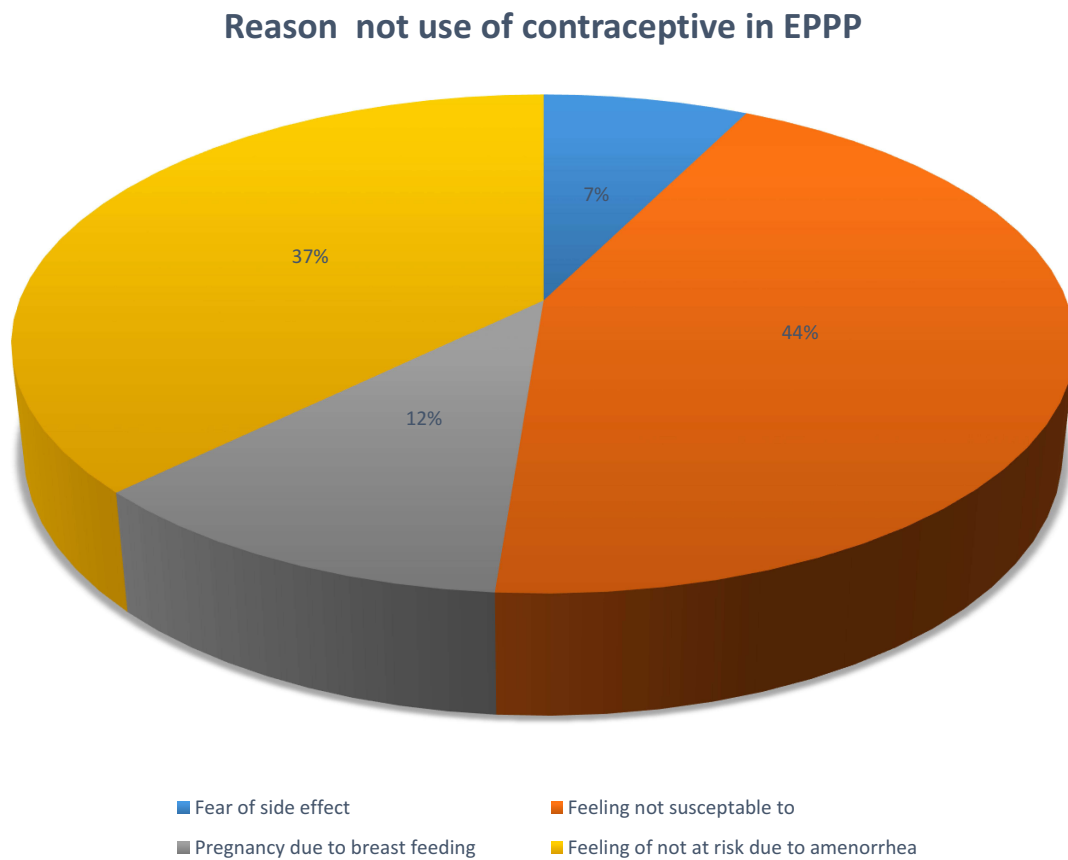


Figure 4 Reasons for modern contraceptive non-use in the EPPP, in Goncha Siso Enesie district, East Gojjam Zone, Ethiopia, 2020.

Table 3 Knowledge About Modern Contraceptive Among Extended Postpartum Women in Goncha Siso Enese District, Ethiopia, 2020

Variables		N (%)
Do you heard about method of modern family planning that can be used after delivery?	Yes	582(94)
Do you know modern contraceptive used to prevent unwanted pregnancy?	Yes	579(93.5)
Do you Know side effects of modern contraceptives?	Yes	464(75)
If a woman is having side effects of one kind of contraceptive pill, switching to another type might help?	Yes	528(85.3)
Health education is important for women who want to use contraception?	Yes	575(92.9)
Using both a condom and the pill is considered to be a very effective contraceptive?	Yes	334(54)
Do you Know that fertility Resumed after stopping modern contraceptive?	Yes	574(92.7)
Do you Know that the right to get any contraceptives methods that you want?	Yes	572(92.4)
Do you Know that where to get any contraceptives methods that you want	Yes	581(93.9)
Women using the birth control Depo-Provera must get an injection every three months?	Yes	564(91.1)
Overall Knowledge	Poor	138(22.3)
	Good	481(77.7)

Among those women, the main source of information about the contraceptive method was from health extension workers. The majority of respondents knew about modern contraceptive methods, with 551 (89%) knowing about injectable methods and 236 [38.1%] knowing about implants (Table 4).

Contact with Health Care Professionals During Maternal and Child Health Care Services

Only 343 (55.4%) and 344 (55.6%) received family planning counseling during antenatal care and delivery, respectively, out of 599 (96.8%) who had an antenatal care check up in their previous pregnancy. Regarding the place of

Table 4 Having Information About Modern Contraceptive Among Extended Postpartum Women in Goncha Siso Enese District, Ethiopia, 2020

Variable		N (%)
Having information on modern contraceptive	Yes No	582(94) 37(6)
Type of modern contraceptive known	POP COC IUCD Injectable Male condom Implant Female sterilization Others ^a	48(7.8) 42(6.8) 19(3.1) 551(89) 10(1.6) 236(38.1) 15(2.4) 2(0.32)
Source of information	Health care professional Friends Media Health extension worker	259(41.8) 102(16.5) 24(3.9) 494(79.8)

Notes: ^aMale sterilization (N=1), Emergency contraceptive (N=1).

delivery for the last birth of respondents, 97 (15.7%) gave birth in government hospitals, 438 (70.8%) gave birth in government health centers, and 84 (13.6%) were at home. Doctors, midwives, nurses, untrained traditional birth attendants, and trained traditional birth attendants assisted the majority of deliveries, assisting 94 (15.2%), 441 (71.2%), 69 (11.1%), and 15 (2.4%) of the women, respectively. Sixty six (10.7%) were waiting in the maternity waiting room and among these 41 women counseling about modern contraceptive use. Postnatal care was received by 481 (77.1%) of the respondents. Only 463 (77.4%) of women who had a postnatal checkup received family planning counseling. The majority of women, 590 (95.3%), visit health institutes to get vaccines for their children, while 321 [1.9%] have been linked to the EPPP service by health (Table 5).

Factors Associated with EPPP Modern Contraceptive FP Method Utilization

About 15 variables with a p-value of ≤ 0.25 were included in the multivariable logistic regression. In multivariable logistic analysis, discussion with the husband, educational status of respondents, fertility desire, resumption of menses, sexual resumption, FP counseling at ANC, and getting linkage to FP during child immunization were

Table 5 Contact with Health Care Professionals Among Postpartum Women in Goncha Siso Enese District, Ethiopia, 2020

Variables	Category	N (%)
ANC visits during the last pregnancy	Yes	599(96.8)
	No	20(3.2)
Number of ANC visits	1	15(2.4)
	2–3	342(55.3)
	≥ 4	242(39.1)
Counselled for FP during ANC	Yes	343(55.4)
	No	256(41.4)
Pregnant women utilizing waiting room	Yes	66(10.7)
	No	553(89.3)
Counselled for FP in waiting room	Yes	41(6.6)
	No	25(4)
Place of delivery for recent child	Government hospital	97(15.7)
	Government health center	438(70.8)
	At home	84(13.6)
Birth attendant	Doctor	94(15.2)
	Midwife/Nurse	441(71.2)
	Untrained traditional birth attendant	69(11.1)
	Trained traditional birth attendant	15(2.4)
Counselled for FP during delivery	Yes	344(55.6)
	No	275(44.4)
Post Natal Care(PNC)	Yes	481(77.7)
	No	138(22.3)
Counselled for PNC	Yes	463(74.8)
	No	18(2.9)
Immunization visit	Yes	590(95.3)
	No	29(4.7)
Getting linkage to FP by health care worker during child immunization visit	Yes	321(51.9)
	No	269(43.5)

significantly associated with EPPP modern FP utilization at $p < 0.05$ (Table 6).

Women who had discussions about modern contraceptives with their husbands were 7.6 times (AOR = 7.65, 95% CI: 4.20–14.05) more likely to use modern contraceptive methods in the extended postpartum period compared to their counterparts. The odds of using modern contraceptive methods in the EPPP among women with secondary educational status were 3.8 times (AOR = 3.85, 95% CI: 1.36–10.93) more likely than for women whose educational status was college level and above.

Women who resumed menstruation after birth were 9.2 times more likely to use contraception in the EPPP

than those who were amenorrheic in the postpartum period (AOR = 9.25, 95% CI: 5.66–15.12). The odds of using modern contraceptives among women who had resumed sexual activity were 8.5 times (AOR = 8.57, 95% CI: 2.19–33.58) more likely than for those who had not resumed sexual activity after birth. Women who have not decided when to have children 3.4 times (AOR 3.49, 95% CI: 1.99, more likely to use during EPPP compared to those who had desire to have children after two. Women who received FP counseling during their ANC visit were twice as likely (AOR = 2.04, 95% CI: 1.25–3.34) to use contraception in the EPPP as their counterparts.

Women who had linked to FP service by health professional during child immunization visit were 2.7 times [AOR 2.74, 95% CI; 1.67–4.50] more likely during postpartum period compared to those who not linked (Table 6).

Discussion

One of the interventions for reducing maternal and child morbidity and mortality is postpartum modern contraception. In developing countries such as Ethiopia, women in the postpartum period do not have access to services that address their desire to delay childbirth and avoid an unintended pregnancy and its consequences.

The magnitude of postpartum modern contraceptive use was 375 (60.6%, 95% CI: 57–64%) in this study. The result of this study is in line with the study done in Debre Tabor town (63%) and Injibara town (58.5%),^{7,25} and the finding is lower than study done in Kenya

86.3%,²⁶ Addis Ababa (80.3%) and Hosanna town (72.9%),^{27,28} This discrepancy might be due to the socio-demographic characteristics of the respondents. That means there is higher health service coverage in Addis Ababa and Hosanna town than in the Goncha Siso Enese district. And the findings of this study are far superior to those of a study conducted in Parakou, a city in Northern Benin 13%,²⁹ Somalia region Kebribeyah town, 12.3%,³⁰ Dello Mena district 14.3%,²² East Gojjam zone, Gozamen district 46.7%.²⁰ The discrepancy could be due to the time gap between the studies and the presence of some dissimilar sociodemographic and reproductive characteristics among the participants. According to the literature, discussion with partners about modern contraceptive use was lower (50.3%) in Parakou, a city in Northern Benin, than in this study.²⁹ Other possible causes of religion in the Somalia region, Muslims in Kebribeyah town and Dello

Table 6 Factor Associated with Extended Postpartum Modern Contraceptive Use, in Goncha Siso Enese District, Ethiopia, 2020

Variables	Contraceptive Use in the EPPP		COR (95% CI)	AOR (95% CI)
	Yes (%)	No (%)		
Discussion with husband				
Yes	327(72.6)	123(27.3)	8.14(5.19–12.76)	7.68(4.20–14.05) *
No	32 (24.6)	98(75.3)	I	I
Educational status				
Illiterate	218(56.91)	165(43.08)	I	I
Read & write	43(66.15)	22(33.84)	1.47(0.85–2.57)	1.1(0.491,2.487)
Primary (1–8)	54(58.06)	39(41.93)	1.04(0.66–1.66)	1.48(0.76–2.92)
Secondary (9–12)	29(76.31)	9(23.68)	2.43(1.12–5.29)	3.85(1.36–10.93) *
College & above	31(77.5)	9(22.5)	2.6(1.21–5.62)	7(1.92–25.57) *
Menses resumed				
Yes	285(80.73)	68(26.87)	8.19(5.68–11.82)	9.25(5.66–15.11) *
No	90(33.83)	176(66.16)	I	I
Resumed sex				
Yes	367(63.93)	207(36.06)	8.2(3.75–17.94)	8.57(2.19–33.58) *
No	8(17.77)	37(82.22)	I	I
Fertility desire				
After 2 years	178(57.98)	129(42.01)	I	I
No more children	41(43.61)	53(56.38)	0.56(0.35–0.89)	0.97(0.48–1.95)
Undecided	156(71.55)	62(28.44)	1.82(1.26–2.64)	3.49(1.99–6.14) *
FP counseling at ANC				
Yes	226(65.88)	117(34.11)	1.6(1.15–2.23)	2.04(1.25–3.33) *
No	140(54.68)	116(45.31)	I	I
FP service linkage with child immunization				
Yes	241(75.07)	80(24.92)	3.31(2.34–4.70)	2.74(1.67–4.50) *
No	128(47.58)	141(52.41)	I	I

Notes: I=reference and *p-value < 0.05.

Mena district, were higher (91.7%, 89.7%) than those in this study.^{22,30} However, all of the respondents in this study were Orthodox. The other possible reason for the difference might be the difference in the educational level of the study participants. In the study conducted in the Gozamen district, the proportion of women who were illiterate was higher (67.3%) than that of this study (39.7%).²⁰ The most frequently utilized modern contraceptive methods were injectable followed by implant.

Mothers' educational status was found to have a significant association with postpartum contraceptive use in a multivariable analysis. This might be due to the fact that educated women have a better understanding of the benefits of contraception and the risks of a short interval of pregnancy. As a result, they have a better understanding of visiting health facilities and receiving services than those with no formal education or who are illiterate. The findings of this study are consistent with those of previous studies conducted in Bangladesh, Axum, and Injibara.^{7,23,31} Having discussion about modern FP methods with partner was significantly associated with postpartum modern contraceptive use. This is supported by reports from Urban Ghana,³² Kebri Beyah Ethiopia.³⁰ This might be due to women who discuss modern FP with their partners, who are more likely to get acceptance and support. Resumption of menstruation was found to be significantly related to postpartum family planning. This could be due to mothers' perceptions that once menstruation has resumed, the risk of pregnancy increases, motivating them to use contraceptive methods. This is in line with the studies conducted in Aksum town,²³ and Gozamen District.²⁰

Resumed sexual activity is one variable that showed statistically significant association with postpartum contraceptive use. This might be due to the fact that women who resume sexual activity have a fear of getting pregnant. As a result, they seek contraception more than those who have not resumed sex. This finding is consistent with study done in Urban Ghana,³² Hosanna town,²⁷ Aksum town.²³ Fertility desire is another variable which is positively associated with modern contraceptive use during the extended postpartum period. This finding is consistent with the findings of a study conducted in rural Ghana, which found that women with a high parity may be satisfied with the number and sex of their children and may wish to limit their births.³³

This study also showed that family planning counseling during antenatal care was associated with modern contraceptive use during the extended postpartum period. Women

who had received family planning counseling during the ANC had approximately 2 times higher odds of using modern contraceptives in the extended postpartum period than their counterparts. This may be because women who receive family planning counseling during the ANC might be highly motivated to use modern contraceptive methods. This finding is in line with study done Kebribeyah town, Somali region,³⁰ Aksum,²³ and Gondar city.³⁴ The possible reason for this may be that counseling during ANC would create an opportunity for women to have more exposure to information and awareness regarding birth spacing by the use of contraceptives after giving each birth.

In this study, 52% of women had linkage to family planning service by professionals while coming to health institute for child immunization service. Those who were linked have higher odds of using postpartum contraceptives. This could be explained by the fact that the recommended infant vaccination schedule allows multiple health care contacts with women during the first year of life, so this makes it easy to screen women who do not use family planning and to link them to an FP clinic. This finding is supported by another study reported in Butajira,¹⁵ as a result, child immunization has a significant association with the use of postpartum contraception.

Conclusions

This study showed a high prevalence of postpartum modern contraceptive use in the Goncha Siso Enese district. Injectables and implants are the most commonly used methods during the postpartum period. Discussion with the husband, the educational status of the respondent, menstrual resumption, sexual resumption, fertility desire, FP counseling during ANC, linkage to FP during child immunization, were positively associated factors with postpartum contraceptive use. Improving women's education in collaboration with various stakeholders, as it is critical to increasing access to postpartum family planning. Health providers must put great emphasis on transferring messages during maternal health care services about postpartum contraceptive use and should better strengthen intensive counseling on postpartum contraceptive use.

Abbreviations

ANC, antenatal care; AOR, adjusted odds ratio; COC, Combined Oral Contraceptive; CPR, contraceptive prevalence rate; DHS, Demographic Health Survey; EDHS, Ethiopian Demographic and Health Survey; EPPP, extended postpartum period; FP, family planning; HDSS,

Health and Demographic Surveillance Site; HEW, health extension workers; IUCD, Intra Uterine Contraceptive Device; MNCH, Maternal, Newborn, and Child Health; MNH, Maternal and New born Health; OR, odds ratio; PNC, postnatal care; POP, Progesterone Only Pills; PPC, postpartum contraceptive; PFP, postpartum family planning; WHO, World Health Organization.

Data Sharing Statement

The data sets generated during this study are available from the correspondences on reasonable request.

Ethical Consideration

Ethical clearance was obtained from the ethical review committee of the Debre Markos University institutional review board (IRB). An official letter was written from DMU to Goncha Siso Enese district Health office to get ethical clearance and a supportive letter to the selected Kebeles' administration to get permission. During data collection, informed written consent was obtained from all women aged over 18 years. The information about the study participants was not disclosed to anyone other than the principal investigators in order to maintain their confidentiality. Generally, this study was conducted in accordance with the World Medical Association Declaration of Helsinki.

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Author Contributions

All authors made a significant contribution in the conception, study design, execution, acquisition of data, analysis and interpretation; took part in drafting, and gave final approval of the version to be published, and have agreed on the journal to which the article has been submitted, and agree to be accountable for all aspects of the work.

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Disclosure

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