Original Article

SAGE Open Medicine

SAGE Open Medicine
Volume 12: 1–8

DOI: 10.1177/20503121231223617
journals.sagepub.com/home/smo
Sage

Post-abortion contraceptive utilization and associated factors among women who attended abortion services: A health facility cross-sectional study

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Abstract

Background: Post-abortion contraceptive utilization prevents unintended pregnancies, reduces the number of abortions, and lowers the morbidity and mortality related to obstetric complications. It plays a central role in improving maternal health and reducing child mortality. However, many women are suffering from unintended pregnancy and its complications after abortion care. Hence, the main objective of this study was to determine the magnitude of post-abortion contraceptive utilization and its associated factors in Bahir Dar City. **Methods**: Health-facility-based cross-sectional study was conducted in Bahir Dar city health facilities from April 1 to May 30, 2018. A systematic random sampling technique was used to select 354 eligible study participants. A pre-tested semi-structured questionnaire was used to collect the data. Data entry was done using Epi Data version 3.7 software and analyzed by SPSS v23 software. Descriptive statistics were done based on the nature of the data. A simple logistic regression model was used to identify the association and strength of exploratory variables and the outcome variables. Associations were announced at a 95% confidence interval and *p*-value <0.05 with adjusted odds ratio. Model fitness was checked by the Hosmer–Lemeshow goodness of fit test for logistic regression. **Results:** In this study, 348 aborted participants were involved with a mean age of 24.37 ($\pm$5.73) years. About 40% of the participants were not currently married and 12.9% were unable to read and write. The magnitude of post-abortion contraceptive utilization was 65.8%. The number of alive children (adjusted odds ratio: 7.0, 95% confidence interval: 1.54, 31.95), lower income (adjusted odds ratio: 0.14, 95% confidence interval: 0.03, 0.60), and (adjusted odds ratio: 0.11, 95% confidence interval: 0.02, 0.46), primary school education (adjusted odds ratio: 0.18, 95% confidence interval: 0.03, 0.97), and currently unemployed (adjusted odds ratio: 0.23, 95% confidence interval: 0.06, 0.85) were significantly associated with the post-abortion contraceptive utilization. **Conclusion:** The level of post-abortion contraceptive utilization is low as per the national plan. The number of alive children, lower income, lower education, and currently unemployed were the identified factors affecting post-abortion contraceptive utilization. Therefore, a collaborative effort is needed among stakeholders to increase the utilization and avoid factors that prevent the utilization of post-abortion contraceptive utilization.

Keywords

Abortion, reproductive-age-women, contraceptive utilization, health institutions, Bahir Dar city

Date received: 22 May 2023; accepted: 12 December 2023

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Background

Intended abortion is the process of termination of a pregnancy before the fetus's viability, and it is a global issue that affects every country.[1] According to a WHO report, every day in 2020, almost 800 women died from preventable causes related to pregnancy and childbirth. Almost 95% of all maternal deaths occurred in low and lower-middle-income countries in 2020.[2]

Abortion is now legal in Ethiopia in cases of rape, incest, or fetal impairment.[3,4] A woman can legally terminate a pregnancy if her life or her child's life is in danger, or if continuing the pregnancy or giving birth endangers her life.[4–8] A woman may also terminate a pregnancy if she is unable to bring up the child, owing to her status as a minor or a physical or mental infirmity.[3,4]

Post-abortion care is widely recognized as a critical practice to address complications related to miscarriage and incomplete abortion and reduce repeat abortions by the provision of contraception services.[7,9–11] According to different studies, post-abortion contraceptive utilization (PACU) can be affected by different factors such as marital status, educational status, previous contraceptive use, counseling of family planning, grand multipara, and public health institutions.[12–17]

Post-abortion contraception utilization may be important for women who do not want to become pregnant.[18–20] However, different studies revealed that it is underutilized public health intervention in Ethiopia and the study area in particular.[21–23] Thus, the main aim of this study was to determine the level of PACU and associated factors among reproductive age group women who received abortion services in Bahir Dar City, North West Ethiopia.

Methods

Study design, setting, and period

A health-facility-based cross-sectional study was conducted in Bahir Dar City from April 1 to May 30, 2018. The city is located in Amhara National, Regional State, 565 km from Addis Ababa, the capital city of Ethiopia. The city had 318,429 residents before the data collection according to the national census. There are 2 public hospitals, 11 health centers, 2 reproductive-health-based NGO (non-governmental organization) clinics, and private health facilities found in the city. These health institutions gave comprehensive abortion health services for Bahir Dar City and the surrounding population, including reproductive health services, abortion, and family planning activity, to the reproductive age group.[24]

Characteristics of the population

The source population for this study consisted of all who underwent abortion care services in Bahir Dar city health institutions. Those women who lost their consciousness after the abortion and were unable to speak the local language were excluded.

Sample size determination and procedure

The sample size was determined using a single population proportion formula by considering a 95% confidence level, 5% margin of error, and PACU level of 70.1% in Jimma town.[5]

Nine health institutions (six health centers, two hospitals, and one NGO clinic) were recruited for the study using the simple random sampling technique. The sampling allocation was based on the 2-month average number of client flow for abortion services in each of the health institutions. Then, proportional to size allocation and systematic random sampling techniques were employed to recruit 354 samples. In this study, the sampling interval *K* for the systematic random sampling techniques was calculated by dividing the population size that is, 708/354 which yields two. Therefore, every other client was selected to be a study participant. The first participant was selected by lottery method. Then every other client was interviewed till the desired sample size was fulfilled. The abortion registration logbook was used as a sample frame to identify the clients.

Operational definitions

Contraceptive utilization: the use of contraceptive methods to avoid or delay pregnancy by sexually active married and not-married women or their partners at the time of the survey.[25]

Unintended pregnancy: a pregnancy that is mistimed or unwanted.[25]

Data collection procedures and quality assurance

The data were collected using a standard and structured interview questionnaire which was adapted from similar literature.[6,12,26] Data collection tools were initially prepared in English and then translated into the local language (Amharic) and the translation was confirmed by two English language experts. Five BSC nurses were recruited for data collection and one supervisor was assigned for them. One day of training was given to data collectors and the supervisor by the principal investigator about the objective of the study. Sociodemographic and obstetric-related data were collected using a pre-tested structured interviewer-administered questionnaire. A pre-test was conducted on 10% of the sampling population at Woreta Health Center to validate the tool before deploying it to the fieldwork. Following the pretest, amendments were made. The supervisor supervised the data collection process and communicated with the principal investigator daily.

Data processing and analysis

Data were coded and entered into the Epi-Data version 3.7 and exported to SPSS version 23 software for analysis.

Table 1. Sociodemographic characteristics of women who came for abortion care service in Bahir Dar City Health Institution, 2018.

Variable	Category	Post-abortion contraceptives utilized	
		No (%)	Yes (%)
Age of the respondent (years)	15–19	50 (76.9)	15 (23.1)
	20–24	35 (28)	90 (72)
	25–29	12 (12.4)	85 (87.6)
	30–34	7 (21.2)	26 (78.8)
	35–39	11 (57.9)	8 (42.1)
	40–44	4 (4.4)	5 (55.6)
Residence	Urban	90 (32.7)	185 (67.3)
	Rural	29 (39.7)	44 (60.3)
Religion	Orthodox	58 (24.8)	176 (75.2)
	Muslim	34 (62.9)	20 (37.1)
	Protestant	27 (45)	33 (55)
Educational level	Informal education	11 (24.4)	34 (75.6)
	Primary	45 (49.5)	46 (50.5)
	Secondary and above	63 (29.7)	149 (70.3)
Occupation	Un-employed	98 (50)	98 (50)
	Employed	21 (13.8)	131 (86.2)
Marital status	Currently unmarried	83 (40.5)	122 (59.5)
	Currently married	36 (25.2)	107 (74.8)
Amount of monthly income	500–2000 birr	5 (8.9)	51 (91.1)
	2001–4000 birr	11 (28.2)	28 (71.8)
	⩾4001 birrs	12 (21)	45 (79)

Descriptive statistics were used to summarize the characteristics of study participants and presented using text and table. Bivariate and multivariate logistic regression analyses were employed to assess the association between the exploratory variables and PACU. Variables with p-value <0.2 from binary logistic regression were fitted into the multivariable logistic regression. The strength of the association was measured using the adjusted odds ratio (AOR) and 95% confidence interval (CI). A p-value < 0.05 was considered a statistically significant predictor of PACU. Model fitness was checked by the Hosmer–Lemeshow goodness of fit test for logistic regression.[27]

Results

Sociodemographic characteristics of the respondents

In this study, 348 women who took abortion care services participated with a response rate of 98.3%. The mean age of the respondents was 24.37 years old with SD +5.73 years old. Women whose ages were 25–29 years old (87.6%) and urban dwellers (67.3%) were the highest groups who utilized post-abortion contraception. Similarly, about three-fourths of the orthodox currently married participants utilized post-abortion contraception (Table 1).

Obstetrics and contraceptive-related characteristics

Seventy-nine percent of participants who visited health institutions ahead of the current visit had utilized post-abortion contraceptive services. More than half (60.4%) of the participants had current pregnancies planned and wanted were utilize post-abortion contraception. The major reasons for termination of pregnancy were financial, rape pregnancy, to complete education, and being too close to pregnancy. Nearly three-fourth [(75.3%) (189)] post-abortion contraceptive-utilized participants had a medical illness (Table 2).

Utilizations and types of post-abortion contraceptive

Of 348 participants, 229 (65.8%) utilized post-abortion family planning, and post-aborted participants used injectables (33%), implants (24.4%), and intrauterine contraceptive device utilization (4.3%). Only two women used permanent methods (Figures 1 and 2).

Factors associated with PACU

Multivariable logistic regression analysis was conducted to identify independent predictors of post-abortion, contraceptive

Table 2. Obstetrics and contraceptive-related characteristics of women who came for abortion service in Bahir Dar City Health Institution, 2018.

Variable	Category	Post-abortion contraceptives utilized	
		No (%)	Yes (%)
Ever visited a health institution before this visit	Yes	6 (20.7)	23 (79.3)
	No	113 (35.4)	206 (64.6)
Condition of current pregnancy	Wanted, planned, and supported	35 (38.5)	56 (61.5)
	Wanted but unplanned	4 (7.3)	51 (92.7)
	Unwanted and unplanned	80 (39.6)	122 (60.4)
The method used to terminate the pregnancy	Using tablets/pills	34 (32.4)	71 (67.6)
	Using manual procedure	46 (29.9)	108 (70.1)
	Both	39 (43.8)	50 (56.2)
Reasons for termination of pregnancy	Financial reason	2 (18.2)	9 (81.8)
	Health reason	35 (37.2)	59 (62.8)
	Partner pressure	3 (14.3)	18 (85.7)
	Too close pregnancies	1 (4.5)	21 (95.5)
	To complete my education	4 (10.8)	33 (89.2)
	Rape pregnancy	20 (62.5)	12 (37.5)
	Unwanted pregnancy	54 (41.2)	77 (58.8)
Have medical illness	No	57 (58.8)	40 (41.2)
	Yes	62 (24.7)	189 (75.3)
Informed about contraceptives	No	51 (63.75)	29 (36.25)
	Yes	68 (25.4)	200 (74.6)

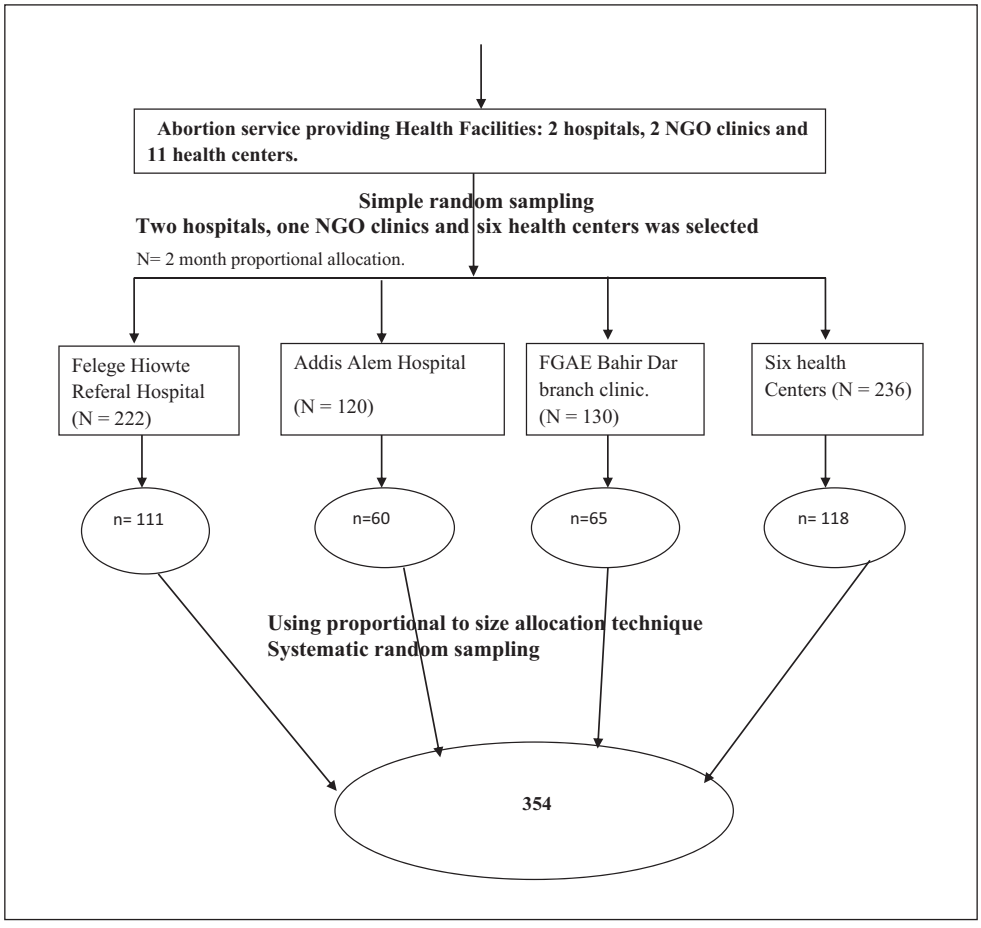

Figure 1. Use of contraceptives after abortion women who came for abortion care service in Bahir Dar City Health Institution, 2018.

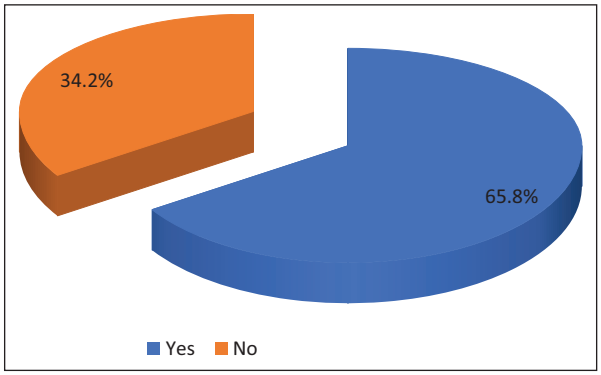

Figure 2. Types of contraceptives used by women who came for abortion care service in Bahir Dar City Health Institution, 2018.

utilization among participants who came to health institutions for abortion services. On the multivariable logistic regression model, age, educational status, occupation, number of live children, and monthly income were significantly associated with PACU at a *p*-value of 0.05 and 95 CI.

The odds of PACU among women who had four and above children were seven times higher than women who had two children (AOR:7; 95% CI: 1.5, 31.9).

The odds of PACU among women who primary school were less likely to use post-abortion contraceptives by 82% as compared with women unable to read and write (AOR: 0.18; 95% CI: 0.03, 0.97).

The odds of post-abortion, contraceptive utilization among women who were currently unemployed participants were less likely to use post-abortion contraceptives by 77% as compared with currently employed (AOR: 0.23, 95% CI: 0.06, 0.25).

The woman who had a monthly income of ⩽2000 Ethiopian birr was 86% more likely to use post-abortion contraceptives than those who had a monthly income of 2001–4000 Ethiopian Birr (AOR: 0.14, 95% CI: 0.03, 0.60). Similarly, women who had a monthly income of ⩽2000 Ethiopian birr were 89% more likely to use post-abortion contraceptives than those who had a monthly income of >4001 Ethiopian Birr (AOR: 0.11, 95% CI: 0.02, 0.46) (Table 3).

Discussion

In this study, the finding revealed that 65.8% of participants utilized post-abortion contraceptives. This result was lower than studies done in Tigray 70.9%,[6] Jimma 70.1%,[5] Addis Ababa 91%,[9] Nepal 83%,[7] and in 10 countries of Asia and sub-Saharan Africa, 77%.[28] However, the result was higher than the study in Debre Markos town, 59.2%,[12] Shire town, 61.5%,[13] India, 29.6%,[17] and Nepal 11%.[11] The possible reason for the discrepancy between this study and others might be due to the time gap in which health services have improved over time. Therefore, there might be an increase in access to modern contraceptive services and information to use the post-abortion family planning service. On the other hand, an inclusive application of counseling is the other significant factor for the high utilization of post-abortion family planning.

This study revealed that the odds of post-abortion contraceptive use were significantly associated with educational level. Those women with primary education were less likely to use PACU compared to women who were unable to read and write. This finding is against the study finding of Debre Markos Town, as women who had attended secondary education were two times more likely to use post-abortion contraceptives compared to those who were unable to read and write.[12] The possible justification for the current study finding was that formal education was not the only source of acquiring knowledge regarding post-abortion family planning utilization. It might be from mass media, health education from health institutions, or relatives, and social relations.

The results of this study revealed that post-abortion contraceptive use was found higher among employed women (77%) than unemployed women. This finding is in line with a similar study done in Bangladesh among employed and unemployed women.[29] This might be due to unemployed women not wanting children anymore.[29] The other possible reason might also be that the unemployed women perceive they have no fee to pay for the family planning services (fear of cost).[30] Similarly, sociodemographic factors were the main reason for the low utilization of family planning among unemployed women.[29]

A woman who had a monthly income of ⩽2000 Ethiopian Birr was more likely to use post-abortion contraceptives than that who had a monthly income of >2001 Ethiopian Birr. This finding is in line with studies done in a tertiary Hospital in Northwest Ethiopia, and Addis Ababa[31,32] but contrary to studies done in Dire Dawa.[33] This indicated that income is not a grantee to use post-abortion family planning.

By contrast, women who had four and above children were more likely to use post-abortion contraceptives than those who had two children. This finding is supported by studies done in Ethiopia with the same title and design.[34] This could be participants who had four and above children and utilized post-abortion contraception because they had sufficient children and needed birth spacing.

Strengths and limitations of the study

As there was no the same study in the study area, it can be used as a baseline for other studies. Similarly, it can also be a blueprint to conduct an interventional study in a particular area. We have used a sufficient sample size to represent the target population.

Table 3. Bivariate and multivariate analyses for factors associated with PACU among women who came for abortion Services in Bahir Dar City Health institutions, 2018.

Variables	Non-PAFP (Post-Abortion Family Planning) users	PAFP users	COR (95% CI)	AOR (95% CI)
Age (years)				
15–19	50	15	1	
20–24	35	90	8.57 (4.27–17.20)***	
25–29	12	85	23.61 (10.24–54.24)***	
30–34	7	26	12.38 (4.49–34.15)***	
35–39	11	8	2.42 (0.82–7.12)	
40–44	4	5	4.17 (0.99–17.51)	
Current marital status				
Currently unmarried	122	83	1	
Currently married	107	36	0.49 (0.31–0.79)**	
Educational level				
Unable to read and write	11	34	1	1
Primary	45	46	0.33 (0.15–0.73)***	**0.18 (0.03–0.97)***
Secondary and above	63	149	0.76 (0.36–1.61)	0.66 (0.11–3.82)
Current occupation				
Currently unemployed	98	98	0.16 (0.09–0.27)***	**0.23 (0.06–0.85)***
Currently employed	131	21	1	1
Monthly income				
<+2000 ETB	5	51	1	1
2001–4000 ETB (Ethiopian Birr)	11	28	0.25 (0.79–0.80)**	**0.14 (0.03–0.60)****
⩾4001 ETB	12	45	0.37 (0.12–1.12)	**0.11 (0.02–0.46)****
Ever given birth?				
Yes	35	118	1	
No	84	111	0.39 (0.25–0.63)***	
Number of children alive				
No children	112	84	1.33 (0.62–2.87)	
1 child	36	6	6.00 (1.95–18.42)***	1.92 (0.46–7.64)
2 children	53	7	7.57 (2.61–21.95)***	**7.00 (1.54–31.95)***
3 children	13	7	1.85 (0.57–5.95)	0.44 (0.11–1.86)
⩾4 children	15	15	1	1
Ever had an abortion?				
Yes	27	6	2.52 (1.01–6.27)**	
No	202	113	1	
Have information on family planning methods?				
Yes	202	86	2.87 (1.63–5.06)***	
No	27	33	1	
Have post-abortion contraceptive counseling?				
Yes	89	211	0.25 (0.13–0.48)***	
No	30	18	1	
Have influenced the use of contraceptives?				
Yes	98	120	1	
No	21	109	4.24 (2.47–7.25)***	

*$p < 0.05$.**$p < 0.01$.***$p < 0.001$.

There might be a potential bias in responding to reproductive health-related questions. Measurement bias might also occur during data collection. There is difficulty in distinguishing the cause–effect relationships (temporal relationships).

Conclusion and recommendations

The level of PACU is low as per the national plan. Alive children, income, primary school education, and currently unemployed were the identified factors affecting PACU.

Therefore, a collaborative effort is needed among stakeholders to increase the utilization and avoid preventive factors of PACU.

Acknowledgements

We would like to thank our data collectors and the supervisor for their invaluable effort; our deep gratitude also goes to our study participants who volunteered and took their time to give us all the relevant information for the study. Last but not least, we would like to thank all hospitals chief executive managers for their cooperation and support during the data collection.

Author' contributions

All authors contributed to data analysis, drafting or revising the article, gave final approval of the version to be published, agreed to the submitted journal, and agreed to be accountable for all aspects of the work.

Availability of data and materials

The data can be accessed from the corresponding author through the following address hailemariam2129@gmail.com. The data will be accessed for research purposes and this is because, during the ethical clearance process, we agree with the Institutional Review Board of GAMBY Medical and Business College to keep the confidentiality of the data set.

Consent to publish

Not applicable.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Ethics approval

Ethical approval was obtained from the Institutional Review Board of GAMBY Medical and Business College (APPROVAL NUMBER/ GC-221/2010)*.

Ethics approval and consent to participate

Ethical approval was obtained from the Institutional Review Board of GAMBY Medical and Business College with the reference number GC-221/2010. The support letter was obtained from the Amhara Health Bureau and the municipal office for construction site contractors and other concerned organizations. Before collecting the data, the purpose of the study was explained to the study participants, and verbal informed consent was obtained from each participant. The verbal informed consent was taken because the nature of the study is not interventional and it was approved by the Research and Publication Office of GAMBY Medical and Business College. For younger ladies (15-18 years of age), assent was taken from them and parental/guardian permission was secured. The names of the patients were not used to ensure anonymity and confidentiality.

Inform consent

Verbal informed consent was obtained from each participant. Verbal informed consent was taken because the nature of the study is not interventional and it was approved by the Research and Publication Office of GAMBY Medical and Business College. For younger ladies (15–18 years of age), assent was taken from them and parental/guardian permission was secured.

Trial registration

Not applicable.

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Supplemental material

Supplemental material for this article is available online.

References

1. Rigterink ES, Saftlas AF and Atrash HK. Chapter 16—Induced abortion. In: Goldman MB, Troisi R and Rexrode KM(eds.) *Women and Health*. 2nd ed. University of Iowa: Academic Press, 2013. pp. 235–250.
2. WHO. *Maternal mortality: key facts*. World Health Organization Geneva, https://www.who.int/news-room/fact-sheets/detail/maternal-mortality (2023).
3. Wada T. Abortion law in Ethiopia: a comparative perspective. *Mizan Law Review* 2008; 2(1): 1–32.
4. Holcombe SJ and Kidanemariam Gebru S. Agenda setting and socially contentious policies: Ethiopia's 2005 reform of its law on abortion. *Reprod Health* 2022; 19(Suppl 1): 218.
5. Erko E, Abera M and Admassu B. Safe abortion care, utilization of post abortion contraception and associated factors, Jimma Ethiopia. *J Women's Health Care* 2016; 4(4): 5–9.
6. Hagos G, Tura G, Kahsay G, et al. Family planning utilization and factors associated among women receiving abortion services in health facilities of central zone towns of Tigray, Northern Ethiopia: a cross sectional Study. *BMC Women's Health* 2018; 18(1): 83.
7. Khanal V, Joshi C, Neupane D, et al. Practices and perceptions on contraception acceptance among clients availing safe abortion services in Nepal. *Kathmandu Univ Med J* 2011; 9(3): 179–184.
8. Makenzius M, Faxelid E, Gemzell-Danielsson K, et al. Contraceptive uptake in post abortion care—secondary outcomes from a randomised controlled trial, Kisumu, Kenya. *PLoS One* 2018; 13(8): e0201214.
9. Asrat M, Bekele D and Rominski SD. Post-abortion contraceptive acceptance and choice among women receiving abortion care at Saint Paul's Hospital, Addis Ababa, Ethiopia: a cross-sectional study. *Lancet Glob Health* 2018; 6: S37.
10. Azmat S, Waqas H, Muhammad I, et al. Post-abortion care family planning use in Pakistan. *Pakistan J Public Health* 2012; 2(2): 4–9.

11. Mehata S, Bhattarai N, Menzel J, et al. Prevalence and correlates of postabortion long-acting reversible contraceptive (LARC) use among young women (24 and below) in Nepal: strategy in the search for improvements. *Reprod Health* 2019; 16(1): 55.
12. Kokeb L, Admassu E, Kassa H, et al. Utilization of post abortion contraceptive and associated factors among women who came for abortion service: a hospital based cross sectional study. *J Fam Med Dis Prev* 2015; 1(10.23937): 2469–5793.
13. Moges Y, Hailu T, Dimtsu B, et al. Factors associated with uptake of post-abortion family planning in Shire town, Tigray, Ethiopia. *BMC Res Notes* 2018; 11(1): 928.
14. Prata N, Bell S, Holston M, et al. Factors associated with choice of post-abortion contraception in Addis Ababa, Ethiopia. *Afric J Reprod Health* 2011; 15(3): 55–62.
15. Rasch V, Yambesi F and Massawe S. Medium and long-term adherence to postabortion contraception among women having experienced unsafe abortion in Dar es Salaam, Tanzania. *BMC Pregnancy Childbirth* 2008; 8(1): 32.
16. Shrestha A and Sharma P. Post abortion choice and acceptance of contraception. *Nepal J Obstetr Gynaecol* 2013; 8(1): 14–17.
17. Zavier AF and Padmadas SS. Postabortion contraceptive use and method continuation in India. *Int J Gynecol Obstetr* 2012; 118(1): 65–70.
18. Tekle Lencha T, Alemayehu Gube A, Mesele Gessese M, et al. Post-abortion family planning utilization and associated factors in health facilities of Wolaita Zone, Southern Ethiopia: mixed study. *PLoS One* 2022; 17(6): e0267545.
19. Kayi EA, Biney AAE, Dodoo ND, et al. Women's post-abortion contraceptive use: are predictors the same for immediate and future uptake of contraception? Evidence from Ghana. *PLoS One* 2021; 16(12): e0261005.
20. Atiglo DY and Biney AAE. Postpartum and post-abortion contraceptive use among unmarried young women in Ghana. *J Biosoc Sci* 2021; 53(3): 459–470.
21. Samuel M, Fetters T and Desta D. Strengthening postabortion family planning services in ethiopia: expanding contraceptive choice and improving access to long-acting reversible contraception. *Glob Health Sci Pract* 2016; 4(Suppl 2): S60–S72.
22. Muchie A, Getahun FA, Bekele YA, et al. Magnitudes of post-abortion family planning utilization and associated factors among women who seek abortion service in Bahir Dar Town health facilities, Northwest Ethiopia, facility-based cross-sectional study. *PLoS One* 2021; 16(1): e0244808.
23. Sedgh G, Bearak J, Singh S, et al. Abortion incidence between 1990 and 2014: global, regional, and subregional levels and trends. *Lancet* 2016; 388(10041): 258–267.
24. Ethiopia Office of the Population and Housing Census Commission. *Summary and statistical report of the 2007 population and housing census: population size by age and sex*. Federal Democratic Republic of Ethiopia, Population Census Commission; 2008.
25. Sedgh G, Ashford LS and Hussain R. *Unmet need for contraception in developing countries: examining Women's reasons for not using a method*. New York, NY: Guttmacher Institute, 2016,0 vol. 2, pp. 2015–2016.
26. Dejenie Seyoum AG and Gizaw Z. *Assessment of post abortion contraceptive intention and associated factors among abortion clients in Gondar Town*, North West Ethiopia, 2013, 2014.
27. Fagerland MW and Hosmer DW. A generalized Hosmer–Lemeshow goodness-of-fit test for multinomial logistic regression models. *Stata J* 2012; 12(3): 447–453.
28. Benson J, Andersen K, Healy J, et al. What factors contribute to postabortion contraceptive uptake by young women? A program evaluation in 10 countries in Asia and sub-Saharan Africa. *Glob Health Sci Pract* 2017; 5(4): 644–657.
29. Islam AZ, Mondal MN, Khatun ML, et al. Prevalence and determinants of contraceptive use among employed and unemployed women in Bangladesh. *Int J MCH AIDS* 2016; 5(2): 92–102.
30. Dioubaté N, Manet H, Bangoura C, et al. Barriers to contraceptive use among urban adolescents and youth in Conakry, in 2019, Guinea. *Front Glob Womens Health* 2021; 2: 655929.
31. Abate E, Smith YR, Kindie W, et al. Prevalence and determinants of post—abortion family planning utilization in a tertiary Hospital of Northwest Ethiopia: a cross sectional study. *Contracept Reprod Med* 2020; 5(1): 39.
32. Kassahun M. *Utilization of post abortion family planning and associated factors among women coming to abortion service in selected abortion clinics at Addis Ababa*. Ethiopia: Addis Ababa University, 2017.
33. Motuma VS, Yadeta TA, Alemu A, et al. Postabortion family planning and associated factors among women attending abortion service in Dire Dawa town health facilities, Eastern Ethiopia. *Front Reprod Health* 2022; 4: 860514.
34. Belachew TB, Negash WD, Asmamaw DB, et al. Prevalence and predictors of post-abortion modern contraceptive utilization among reproductive age women in Ethiopia. *Sci Rep* 2023; 13(1): 15932.