



1 The Effect of Postnatal Care on the Postpartum Contraceptive Use in 2 Ethiopia: A Systematic Review and Meta-analysis

3 Tesfalem Tilahun Yemane^{1*}, Mengestu Mera^{1, ¶, #b}, Abebe Kassa^{1, &, #a}, Nigusie Tadesse^{1, &, #a}

4

5 ¹Department of Nursing, College of Health Science, Dessie, Ethiopia.

6 ^{#a}Current Address: Department of Nursing, College of Health Science, Dessie, Ethiopia

7 ^{#b}Current Address: Department of Health Service Management, Public Health, Wollo

8 University, Dessie, Ethiopia.

9 *Corresponding author: Tesfalem Tilahun Yemane.

10 E-mail: tesfalemtilahun1@gmail.com (TTY)

11 Abstract

12 **Background:** Postpartum contraceptive use is an essential aspect of maternal and child health.
13 The use of contraception after childbirth is a critical step in ensuring healthy spacing between
14 births, reducing maternal and infant mortality. However, it is often observed that the use of
15 postpartum contraception is low. In this context, postnatal care (PNC) visits are an important
16 opportunity to promote postpartum contraceptive use. Therefore, the aim of this review is to
17 examine the effect of postnatal visits on the utilization of postpartum contraceptive use.

18 **Methods:** We conducted a systematic review and meta-analysis of published and unpublished
19 studies. Pub Med, HINARI, Science direct, Cochrane Library, ETH Library and Google
20 Scholar were used to search all articles. For data analysis, STATA 14 software was used.

21 **Results:** This systematic review research that has not been certified by peer review and should not be used to guide clinical practice. Funnel plots and Egger's test were used to examine the risk of publication bias. Heterogeneity



was checked by using Cochran's-Q test and I^2 test. Random effect model was computed to estimate the pooled prevalence.

Results: The finding of the present systematic review and meta-analysis indicated that having postnatal care visits increase the utilization of postpartum modern contraceptive [pooled effect size 2.92 (95% CI, 2.21, 3.881)]. Postnatal care can provide critical information and support to women during the postpartum period, including information about family planning and contraceptive options.

Conclusion: The utilization of postpartum contraception is a critical aspect of maternal and child health. Postnatal care visits provide an opportunity to promote postpartum contraceptive use. During these visits, healthcare providers can provide information on the available contraceptive methods, counsel women on the benefits and risks of each method, and assist in the selection of a suitable method.

PROSPERO Registration Number: CRD42020156574

Key words: Postpartum contraceptive, postpartum family planning, postnatal care, systematic review, Meta-analysis, Ethiopia.

Introduction

Postpartum contraceptive means the prevention of unintended and closely spaced pregnancies during the first 12 months following childbirth [1]. The use of contraception after childbirth is a critical step in ensuring healthy spacing between births, reducing maternal and infant mortality, and promoting family planning [2, 3]. In Ethiopia, the World Health Organization (WHO) and Ethiopian family planning program recommend an interval of at least 2 years [4, 5] and women recommend receiving postpartum family planning counseling during antenatal, immediate postpartum, and postnatal services [5, 6]. Postnatal care (PNC) presents an opportune moment when women should be counseled on family planning. Contraceptive

method options should be discussed and provided during postnatal care [1, 6]. Short birth intervals increase the risk for the health of both the mother and the child, such as the risk of preterm birth, low birth weight and small for gestational age, increased chances of chronic undernourishment, stunted growth, and child mortality [4, 7]. Using family planning during the postpartum period may help women to space births by at least 24 months, and this fact can also help to reduce maternal and child mortality by 30% and 10 % respectively [8].

Maternal health remains a major global concern since pregnancy and childbirth are the leading causes of morbidity, mortality, and disability among women of the reproductive age group [9]. Integrating PFP into MNCH programs and services contributes to the reduction of high-risk pregnancies, reduced unmet need for Family planning, and improvements in the health and survival of mothers and children [10].

Globally, more than 9 out of 10 women want to avoid their pregnancy at least for the next 24 months after childbirth [11]. According to DHS data from 21 low and middle-income countries between 2005 and 2012, sixty-one percent (61%) of postpartum women had an unmet need for family planning [2, 12]. Studies done in five low-income countries showed that postpartum modern contraceptive use and unmet need varied widely. Half of women have an unmet need for family planning services among all women who wants to delay the next pregnancy [13].

Despite global and national efforts, the uptake of postpartum contraceptives in Ethiopia is still low and the unmet need is high; in 2016, it was estimated that 26% of postpartum women were using family planning in the first year of the postpartum period [6, 14]. Since the uptake of PFP was low, PNC services were a significant variable, it creates windows of opportunity to provide family planning counseling and it leads to offering women modern contraceptive methods [6, 15-17].



Postnatal care visits are a crucial opportunity to promote postpartum contraceptive use [6, 15, 18]. However, the effectiveness of postnatal visits in promoting postpartum contraceptive use is not well understood. Therefore, the aim of this systematic review and meta-analysis is to analyze and summarize the effect of postnatal care services on the uptake of postpartum family planning in Ethiopia. This evidence will help the government of Ethiopia and other stakeholders who work in family planning.

Materials and Methods

Study Design and Protocol Registration

A systematic review and meta-analysis were conducted to quantify the pooled effect of PNC on postpartum contraceptive use. To report this systematic review and meta-analysis, an updated Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020 statement was adapted [19]. The protocol has been registered on the International Prospective Register of Systematic Reviews, the University of York Center for Reviews and Dissemination. Available from: [https://www.crd.york.ac.uk/prospero/display_record.php?](https://www.crd.york.ac.uk/prospero/display_record.php?RegistrationID=CRD42020156574) (Registration ID number =CRD42020156574).

Search strategies

PubMed, HINARI, Science Direct, Cochrane Library electronic databases, Google Search and Google Scholar were systematically searched. Medical subject heading (MeSH), keywords, and gloss were used to identify the components of PICO. Boolean operators ("OR", "AND" and "NOT") were used to combine different search terms. The following keywords were used in the title search: "Postpartum family planning" OR "Postpartum contraceptive" AND Prevalence OR Epidemiology OR utilization OR use AND determinants OR déterminante OR "Factors associated" OR predictors OR postnatal OR 'postnatal care'. This systematic review and meta-analysis used the PICO (Population, Intervention, Comparison, and Outcomes)



framework to identify the eligible articles. The study Population (P) were reproductive age (15-49 years) group women in their first 12 months after delivery, the Intervention (I) was PNC follow-up, the Comparison (C) group were women who did not have PNC follow-up, and the Outcomes (O) of this study were the utilization of postpartum contraceptive within 12 months after delivery.

Criteria for eligibility

Inclusion criteria

All studies reported in the English language, published and unpublished studies, and articles that revealed the association between postnatal care visits and postpartum contraceptive was included in this review. Studies conducted in Ethiopia and published between January 30/2013 and January 30/2023 were included.

Exclusion Criteria

Studies that did not report the PNC visit status as well as their outcomes were excluded. In addition, articles that were not fully accessed after at least two email contacts of the primary author or failed to contact their primary authors were excluded.

Study selection

All searched articles for the review were imported to EndNote X7 and duplicated studies were excluded. All studies were initially examined for inclusion based on information contained in the titles alone and abstracts, and then a full-text review was performed by two independent reviewers (TTY and AK). Potentially eligible articles were identified by two independent reviewers (TTY and AK). Disagreements between the reviewers (TTY and AK) were solved

by discussion & additional reviewer (NT). The PRISMA flow diagrams were used to summarize the overall selection process of the article [19].

Quality assessment of the studies

Three reviewers (TTY, NT, and MM) independently assessed the quality of the included studies. A modified version of the Newcastle-Ottawa Scales was used to evaluate the quality of the studies [20]. The studies were divided into three categories: (0–4) low quality, (5–7) medium quality, and (8–10) high quality [21]. Those studies with medium (satisfying 50%) and high quality were included for analysis.

Data extraction

All data were extracted by two independent reviewers (TTY and MM). The discrepancies were solved through discussion & involving the third reviewer (AK). From each included article, the name of the author/s, publication year, study area & region, study setting, study design, sample size, and adjusted odds ratio with confidence interval were extracted. The extracted data were entered into a Microsoft Excel spreadsheet before being exported to the STATA 14 software.

Data analysis, heterogeneity, and Publication bias

STATA Version 14 (software) was used to calculate the pooled effect size with 95% confidence intervals (95% CI). Statistical heterogeneity was checked by using the Cochran's-Q test and the I^2 test. The I^2 statistics of below 25% are low heterogeneity, 25–50% is moderate heterogeneity, 51–75% is substantial heterogeneity, and above 75% is considerable heterogeneity [22]. A p-value <0.05 was used to declare heterogeneity. Visual inspection of the funnel plots, Egger's weighted regression, and Begg's rank correlation tests were used to examine the possible risk of publication bias. Forest plots and Odds Ratios with their 95% CI



were used to present the pooled effect sizes. We use a random effects model was used to estimate the pooled effect due to the presence of heterogeneity. Subgroup analysis was conducted by region, publication year, study setting, and sample size.

Results and Discussion

Study selection

A total of 1,208 articles were searched through electronic databases and gray pieces of literature. From these, 144 articles were excluded due to duplications, while the remaining 1,064 articles were reserved for further screening. Of these remaining articles, 776 and 221 articles were excluded by their titles and abstracts, respectively. A total of 67 full-text articles were assessed for eligibility criteria. Finally, 10 articles with appropriate quality were included in the final systematic review and meta-analysis. Furthermore, to summarize the selection procedure the PRISMA flow diagram was used. (Fig 1)

Characteristics of Included Studies

As described in **Error! Reference source not found.**, these, 10 original articles were included in this systematic review and meta-analysis. The selected articles were published from 2016 to 2022. One of them was unpublished articles [23]. All included studies are cross-sectional in nature. In this study, 6157 postpartum women were involved. The sample size of the included studies ranged from 342 [17] to 1109 [16]. Out of 10 studies, 6 studies were conducted both in urban and rural settings[15, 18, 23-26], Three in urban[27-29], and one in rural [16] settings. The mean age of postpartum women ranged from 25.4 [24] to 29.82 years[28]. The response rate of included studies ranges from 95.6% [25] to 100 % response rate[16, 27]. Finally, the quality score of the included studies ranges from 7 up to 8 out of 10 points.



Further descriptions and characteristics of the studies included in (Error! Reference source not found.).

Quality of the Studies

The quality of the selected articles was assessed by Newcastle-Ottawa Scale modified versions [20]. Regarding the quality score of the included studies, 7 of the 10 studies had high quality (8-10 points) and the remaining 3 studies were medium level quality (5-7 points). Therefore, studies that had considerable risk were not included in this review (Table 1).

Publication bias and Heterogeneity

Publication bias was presented on traditional funnel plots. The shape of the traditional funnel plots indicates symmetrical distribution (Error! Reference source not found.). Moreover, to ascertain the funnel plot, Begg's and Egger's tests were conducted. Begg's and Egger's test results revealed the absence of statistically significant publication bias ($p = 0.28$ and $p = 0.060$, respectively). Statistical heterogeneity was checked by using the Cochran's-Q test and the I^2 test and through visual examination of the forest plot (overlap of confidence intervals). In this analysis, moderate heterogeneity was observed across the included studies and detected by the Cochran Q test (Q test $p < 0.001$) and I^2 statistics ($I^2 = 50.5\%$) (Error! Reference source not found.). Because of this, a random effects model was used to estimate the effect of PNC follow-up on postpartum contraceptive use. By considering publication year, study setting, and sample size; sub-group analysis was performed to identify the possible source of heterogeneity, but none of these variables were found to be statistically significant (Error! Reference source not found.).



Meta-Analysis

The effect of postnatal care follow-up on the utilization of postpartum modern contraceptive

As shown in the forest plot, the results of 10 included studies indicated that the pooled effect size of postpartum modern contraceptive utilization among those mothers who had postnatal care visits was 2.92 (95% CI, 2.21, 3.88) compared to those mothers without having PNC visits in the random effects model (**Error! Reference source not found.**). The finding of this systematic review and meta-analysis revealed that having postnatal care visits increase the utilization of postpartum modern contraceptive.

Subgroup analysis

To decrease sizeable heterogeneity, subgroup analysis was performed based on the regions where the studies were conducted, the sample size of the studies, the study setting, and the year of publication. Based on subgroup analysis, the effect of postnatal care follow-up on utilization in the Tigray region was 2.08, 95% CI (1.46, 2.97), Southern Nation and Nationalities 2.14, 95% CI (1.48, 3.08) and Oromia was 3.46, 95% CI (2.03, 5.89) (**Error! Reference source not found.**). With regard to sample size, the higher the sample size the more precise the effect size.

Discussion

The findings of this systematic review and meta-analysis revealed that PNC follow-up has a significant effect on the utilization of postpartum contraceptives. The current meta-analysis reported that having postnatal care services were positively associated [2.92 (95% CI, 2.21, 3.88)] with the use of contraceptive during the postpartum period. This suggests that women



who receive postnatal care are almost three times more likely to use contraceptives after giving birth compared to those who do not receive postnatal care.

This finding is consistent with USAID findings from 17 Countries, a systematic review and meta-analysis conducted in low- and middle-income countries, and low-income countries of SSA [30-32]. Those findings suggest that the utilization of contraceptives among postpartum women will increase substantially if more women use postnatal care.

The possible explanation for this finding is that women might get the opportunity for contraceptive counseling and the benefits of birth spacing from health professionals during PNC follow-up. In addition, PNC provides an important opportunity for healthcare providers to deliver appropriate contraceptive methods.

The techniques for testing the publication bias of included studies were considered. It was examined by performing Egger's correlation and Begg's regression intercept tests at a 5% significant level. The results of Begg's and Egger's tests indicated that there was no statistically significant publication bias across the included studies as evidenced by $p = 0.28$ and $p = 0.06$ in Begg's and Egger's tests respectively. In this meta-analysis, to identify the possible sources of heterogeneity, subgroup analysis was performed based on the regions and sample size. However, the result of the subgroup analysis indicated that the source of moderate heterogeneity was not because of the study regions and sample size.

Limitations of the Study

Only English articles were considered to conduct this review. In addition, the majority of studies were obtained from Oromia, Tigray & SNNP regions. Therefore, the results may not be strongly representative of the other regions due to the small number of studies included.



225 **Conclusions**

226 In conclusion, this systematic review and meta-analysis revealed that the pooled effect of
 227 postnatal care on postpartum contraceptive use in Ethiopia was found to be significant, with
 228 women who receive postnatal care being almost three times more likely to use contraceptives
 229 after giving birth compared to those who do not receive postnatal care. Integrating family
 230 planning counseling & service in all MCH units could be an effective strategy to increase
 231 postpartum contraceptive utilization. Therefore, maximizing postnatal care visits helps to
 232 improve the utilization of postpartum contraceptives, as well as for the better outcome of
 233 maternal and child health. Thus, having postnatal care visits is strongly recommended.

234 **Data Availability**

235 Data will be available upon reasonable request to the corresponding author.

236 **Conflict of Interest**

237 The authors declared that we have no competing interests regarding the publication of this
 238 paper.

239 **Funding Statement**

240 No funding was obtained for this work.

241 **Acknowledgments**

242 Not applicable

243 **Authors' contributions**

244 All authors have contributed to this study. TTY contributed to the conception of research
 245 protocol, protocol preparation and registration, study design, literature review, data extraction,



246 data analysis, interpretation, and drafting of the manuscript. NT participated in literature
247 review, data extraction, and quality assessment. AK participated in literature review, data
248 extraction, and quality assessment. MM participated in literature review, data extraction, and
249 quality assessment. All authors read and approved the final manuscript.

250 References

- 251
252 1. WHO, *Programming strategies for postpartum family planning*. 2013. Geneva, Switzerland: WHO
253 Available at: https://www.who.int/reproductivehealth/publications/family_planning/ppfp_strategies/en/
254 Date accessed 2019 Nov 9 2014.
- 255 2. Gaffield, M.E., S. Egan, and M. Temmerman, *It's about time: WHO and partners release programming*
256 *strategies for postpartum family planning*. Global Health: Science and Practice, 2014. 2(1): p. 4-9
257 Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4168603/> Date accessed 2019 Nov 9.
- 258 3. World Health Organization (WHO), D.o.R.H.a.R., *Contraception, Evidence brief* human reproduction
259 programme research for impact, 2019.
- 260 4. DaVanzo, J., et al., *Effects of interpregnancy interval and outcome of the preceding pregnancy on*
261 *pregnancy outcomes in Matlab, Bangladesh*. BJOG, 2007. 114(9): p. 1079-87 Available at:
262 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2366022/> Date accessed 2019 Sep 25.
- 263 5. WHO, *Report of a WHO technical consultation on birth spacing*. Geneva: WHO; 2005 Available at:
264 https://www.who.int/maternal_child_adolescent/documents/birth_spacing05/en/ Date accessed 2019
265 Nov 10. 2018.
- 266 6. Linnea A. Zimmerman, Y.Y., Mahari Yihdego, Solomon Abrha, Solomon Shiferaw, Assefa Seme and
267 S. Ahmed, *Effect of integrating maternal health services and family planning services on*
268 *postpartum family planning behavior in Ethiopia: results from a longitudinal survey*. BMC Public
269 Health, 2019. 19:1448.
- 270 7. Winfrey, W. and K. Rakesh, *Use of family planning in the postpartum period*. : ICF International, 2014.
271 Available at: <http://dhsprogram.com/pubs/pdf/CR36/CR36.pdf>. Date accessed 2019 Nov 10.
- 272 8. Hounton, S., et al., *Patterns and trends of postpartum family planning in Ethiopia, Malawi, and Nigeria:*
273 *evidence of missed opportunities for integration*. Glob Health Action, 2015. 8: p. 29738 Available at:
274 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4642460/> Date accessed 2019 Nov 9.
- 275 9. Kassebaum, N.J., et al., *Global, regional, and national levels and causes of maternal mortality during*
276 *1990–2013: a systematic analysis for the Global Burden of Disease Study 2013*. The Lancet, 2014.
277 384(9947): p. 980-1004 Available at: <https://pubmed.ncbi.nlm.nih.gov/24797575/> Date accessed 2019
278 Sep 16.
- 279 10. WHO, *Statement for collective action for postpartum family planning*. Geneva: World Health
280 Organization, 2013 Available at:
281 <https://www.mchip.net/sites/default/files/PPFP%20Statement%20for%20Action.pdf> Date accessed 2019
282 Nov 9.
- 283 11. Welsh, A., *Best practice in postpartum family planning*. Royal College of Obstetricians and
284 Gynaecologists, 27 Sussex Place, Regent's Park, London NW1 4RG, 2015: p. 1-8.
- 285 12. Moore, Z., et al., *Missed opportunities for family planning: an analysis of pregnancy risk and*
286 *contraceptive method use among postpartum women in 21 low-and middle-income countries*.
287 Contraception, 2015. 92(1): p. 31-39.
- 288 13. Pasha, O., et al., *Postpartum contraceptive use and unmet need for family planning in five low-income*
289 *countries*. Reproductive health, 2015. 12(2): p. S11.
- 290 14. Mossie MY, P.A., Yusuf Y et al. , *Counseling at all contacts for postpartum contraceptive use: can*
291 *paper- based tools help community health workers improve continuity of care? A qualitative study from*
292 *Ethiopia [version 2; peer review: 2 approved, 1 approved with reservations]* Gates Open Research
293 2021, 3:1652 2021.
- 294 15. Abraha, T.H., A.S. Teferra, and A.A. Gelagay, *Postpartum modern contraceptive use in northern*
295 *Ethiopia: prevalence and associated factors - methodological issue in this cross-sectional study*.
296 Epidemiol Health, 2017. 39: p. e2017019r.

16. Abraha, T.H., et al., *Predictors of postpartum contraceptive use in rural Tigray region, northern Ethiopia: a multilevel analysis*. BMC Public Health, 2018. **18**(1): p. 1-10.
17. Belete G. , G.A., and Gela G. , *Utilization and associated factors of modern contraceptives during postpartum period among women who gave birth in the last 12 months in injibara town Awi Zone, North-West Ethiopia* 2019.
18. Teka, T.T., Tesfaye Regassa Feyissa, Alemu Sufa Melka and Firew Tekle Bobo, *Role of antenatal and postnatal care in contraceptive use during postpartum period in western Ethiopia: a cross sectional study*. BMC Research Notes, 2018. **11**:581.
19. Page MJ, M.J., Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al., *The PRISMA 2020 statement: An updated guideline for reporting systematic reviews*. . PLoS Med 2021. **18**(3): (e1003583.).
20. Lo, C.K.-L., D. Mertz, and M. Loeb, *Newcastle-Ottawa Scale: comparing reviewers' to authors' assessments*. BMC medical research methodology, 2014. **14**(1): p. 45 Available at: <https://pubmed.ncbi.nlm.nih.gov/24690082/> Date accessed 2019 Nov 11.
21. Stang, A., *Critical evaluation of the Newcastle-Ottawa scale for the assessment of the quality of nonrandomized studies in meta-analyses*. European journal of epidemiology, 2010. **25**(9): p. 603-605 Available at: <https://pubmed.ncbi.nlm.nih.gov/20652370/> Date accessed 2019 Nov 11.
22. DerSimonian, R. and N. Laird, *Meta-analysis in clinical trials*. Controlled clinical trials, 1986. **7**(3): p. 177-188 Available at: <https://pubmed.ncbi.nlm.nih.gov/3802833/> Date accessed 2019 Nov 11.
23. Getachew, M., *Assessment of postpartum contraceptive adoption and associated factors in Butajira Health and Demographic Surveillance Site (HDSS), in Southern Ethiopia*. 2015 Available at: <http://etd.aau.edu.et/handle/123456789/11952> Date accessed 2019 Oct 8, Addis Abeba Universty.
24. Dona, A., et al., *Timely initiation of postpartum contraceptive utilization and associated factors among women of child bearing age in Aroressa District, Southern Ethiopia: a community based cross-sectional study*. BMC Public Health, 2018. **18**(1): p. 1100.
25. Jaleta, D.N.Y., Hedeja Yenus .Tamirat, Koku Sisay *Timely initiation of postpartum contraceptive and associated factors among women of extended postpartum period in Pawe district, northwest Ethiopia*. Internal Medicine, 2019.
26. Seifu B, Y.D., Daba W., *Knowledge, Utilization and Associated Factors of Postpartum Family Planning Among Women Who Had Delivered a Baby in the Past Year in Oromia Regional State, Ethiopia*. Dovepress, Open Access Journal of Contraception, 2022. **11** 167–176.
27. Mihretie NG. , A.S.D.A., Gebrehana H. , Getie A. ,Getnet B. , Degu A. , *Postpartum Modern Contraceptive Utilization and Associated Factors Among Women Who Gave Birth in the Last 12 Months in Addis Zemen, South Gondar, Ethiopia: Community-Based Cross-Sectional Study*. International Journal of Women's Health, Dovepress, 2022. **12** 1241–1251.
28. Yimam A. , F.G., Kalayu M., Anbesu EW., *Contraceptive Use and Its Associated Factors among Women Who Gave Birth within 12 Months in Dubti Town, Pastoral Community, of Afar Region Northeast, Ethiopia*. Journal of Pregnancy Volume 2021, Article ID 6617189, 8 pages, 2021.
29. Asires, H.A., S. Negash, and Y. Getiye, *Assessment of Contraceptive Need and Practice of Women in the Extended Postpartum Period in Addis Ababa, Ethiopia [8G]*. Obstetrics & Gynecology, 2018. **131**: p. 76-77S.
30. Borda M. , W.W., *Postpartum Fertility and Contraception: An Analysis of Findings from 17 Countries*. United States Agency for International Development (USAID), 2010.
31. Rubee Dev , P.K., Molly Feder, Jennifer A. Unger, Nancy F. Woods and Alison L. Drake, *A systematic review and meta-analysis of postpartum contraceptive use among women in low- and middle-income countries*. Reproductive Health, 2019. **16**: p. 154.
32. Yemane, T.T., et al., *Postpartum Family Planning Use and Its Determinants among Women of the Reproductive Age Group in Low-Income Countries of Sub-Saharan Africa: A Systematic Review and Meta-Analysis*. International Journal of Reproductive Medicine, 2021. **2021**: p. 5580490.



Supporting information

S1 Fig 1: Description of schematic presentation of the PRISMA 2020 flow diagram to select and include studies, 2023.

S2 Fig 2: Funnel plot of the 10 included studies of the effect of PNC on utilization of postpartum contraceptives in Ethiopia, 2023.

S2 Fig 3: Forest plot of 10 included studies, which reveal the effect of PNC on utilization of postpartum contraceptive in Ethiopia, 2023.

S1 Table 1: Descriptive summary of 10 included studies in the systematic review and meta-analysis of the effect of postnatal care on postpartum family planning use among women of the reproductive age group in Ethiopia, 2023.

S2 Table 2: Subgroup analysis for the effect of postnatal care on postpartum family planning use among women of the reproductive age (15-49 years) group in their first 12 months after delivery in Ethiopia, 2023 (n = 10).

S1 File: PRISMA 2020 Checklist

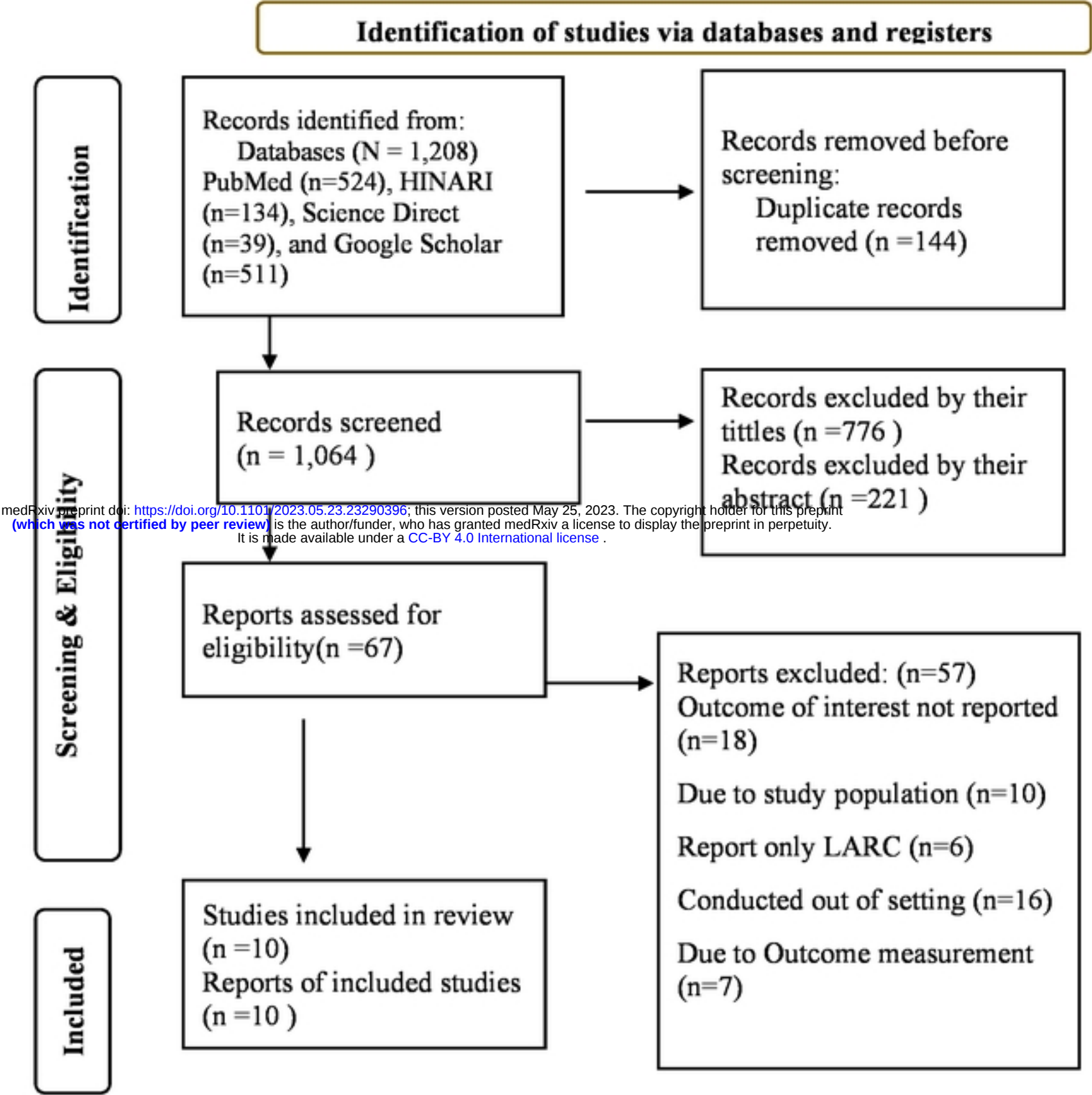


Figure 1. Description of schematic presentation of the PRISMA flow diagram to select and include studies, 2023.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. For more information, visit: <http://www.prisma-statement.org/>

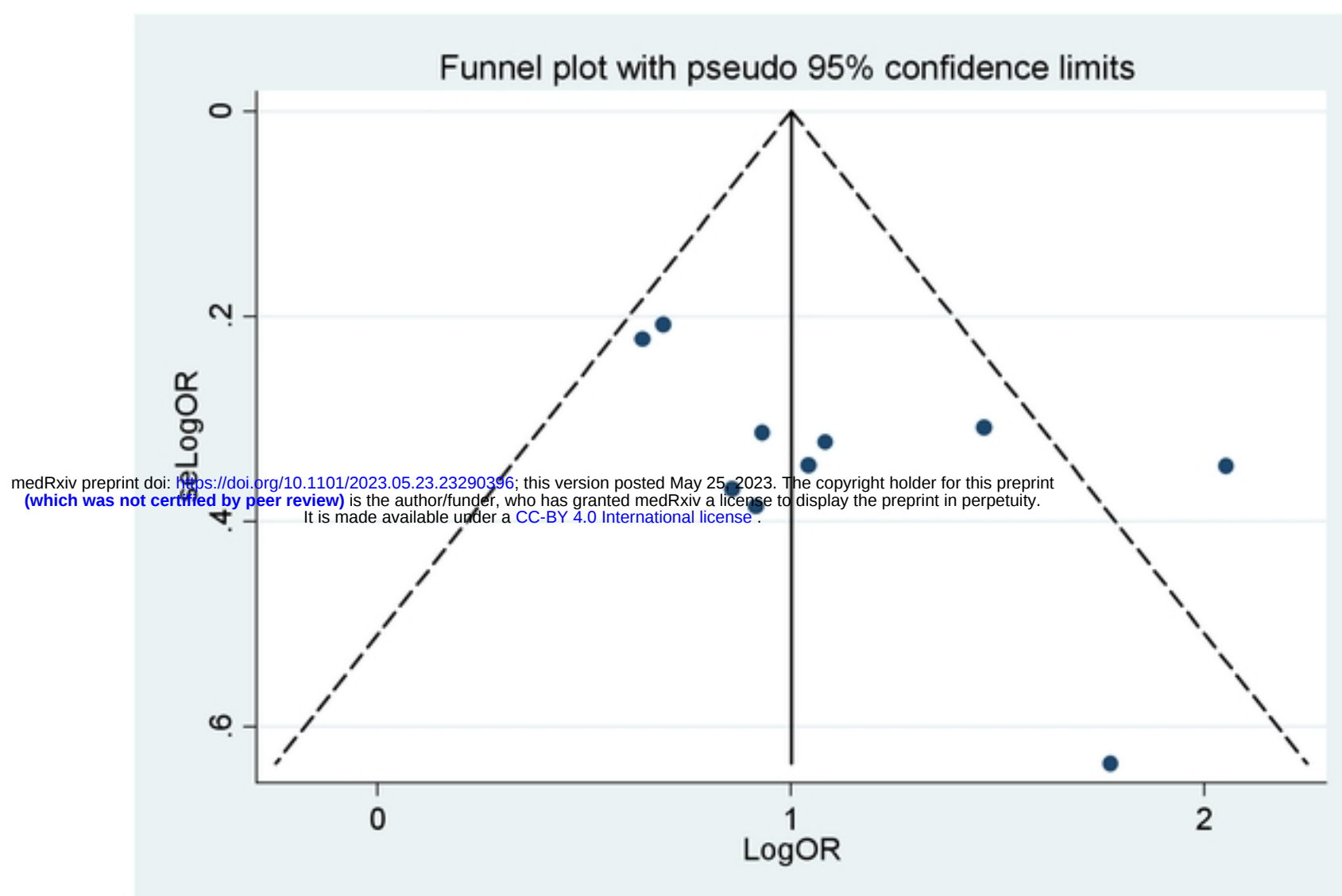


Figure 2: Funnel plot of the 10 included studies of the effect of PNC on utilization of postpartum contraceptives in Ethiopia, 2023.

The vertical line indicates the effect size whereas the diagonal line indicates the precision of individual studies with a 95% confidence interval.

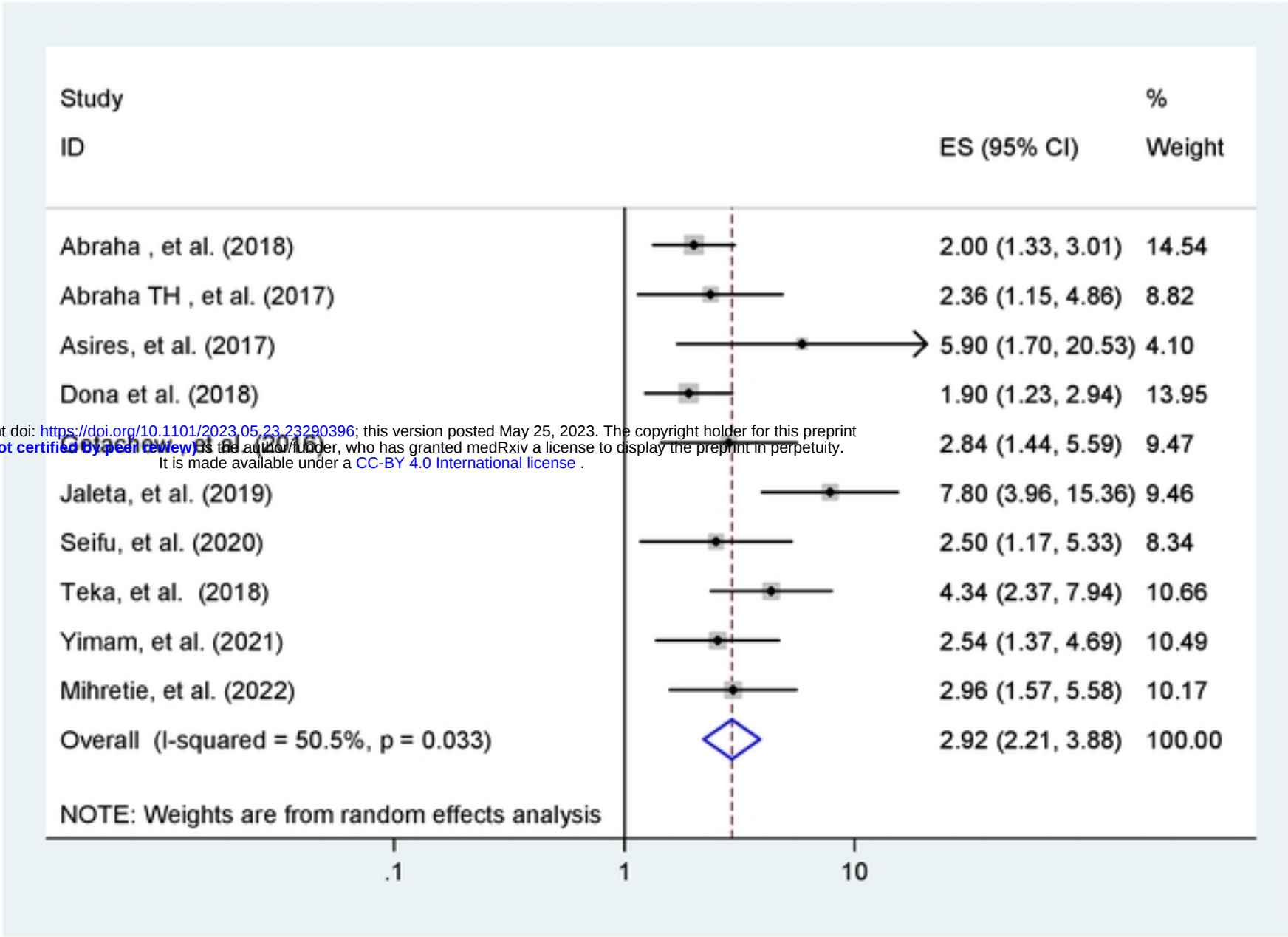


Figure 3: Forest plot of 10 included studies, which reveal the effect of PNC on utilization of postpartum contraceptive in Ethiopia, 2023.