International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2023; 7(6): 35-43
Received: 07-09-2023
Accepted: 08-10-2023

Hend M Hamido
Department of Obstetrics and Gynecology, King Saud Medical City, Riyadh, Saudi Arabia

Aisha I Alshitwi
Department of Obstetrics and Gynecology, King Saud Medical City, Riyadh, Saudi Arabia

Hana I Almadani
Department of Obstetrics and Gynecology, King Saud Medical City, Riyadh, Saudi Arabia

Shafiqa Alkhodairi
Department of Obstetrics and Gynecology, King Saud Medical City, Riyadh, Saudi Arabia

Samer Alharfi
Department of Obstetrics and Gynecology, King Saud Medical City, Riyadh, Saudi Arabia

Belqis Unnais
Department of Obstetrics and Gynecology, King Saud Medical City, Riyadh, Saudi Arabia

Alhussien Alhazmy
Department of Obstetrics and Gynecology, King Saud Medical City, Riyadh, Saudi Arabia

Corresponding Author:
Hend M Hamido
Department of Obstetrics and Gynecology, King Saud Medical City, Riyadh, Saudi Arabia

Impact of group antenatal care on fetal and maternal outcomes, systematic literature review and meta-analysis of recent randomized clinical trials

Hend M Hamido, Aisha I Alshitwi, Hana I Almadani, Shafiqa Alkhodairi, Samer Alharfi, Belqis Unnais and Alhussien Alhazmy

DOI: https://doi.org/10.33545/gynae.2023.v7.i6a.1396

Abstract
Background: Antenatal care is a priority form of preventive medicine for the wellbeing of the mother and baby, it is traditionally provided on one-to-one basis. Emerging evidence suggest beneficial impact of group antenatal care.
Methods: Systematic literature review and meta-analysis of recent (as of 2015) randomized controlled trials, investigating impact of group antenatal care compared to individual antenatal care, on objective fetal and maternal outcomes, namely: preterm labor, low birth weight, caesarean section rates, initiation of breastfeeding, and postpartum depression. Comparisons between group and individual ANC were reported as relative risk and mean differences for binary and continuous outcomes respectively, using random effects model.
Results: Systematic PUBMED and EMBASE search resulted in inclusion of seven articles. Meta-analyses showed no statistically significant differences in the outcomes of preterm labor (4 studies), low birth weight [2 studies), caesarean section rates [2 studies), and mean Edinburgh Postpartum Depression Score [2 studies). A significantly higher chance of breast-feeding initiation was observed in the meta-analysis including 2 studies (RR = 1.13 [95% CI: 1.03-1.24]; p = 0.01).
Conclusion: Group antenatal care resulted in higher chance of breastfeeding initiation with a low grade certainty of evidence, but had no effect on preterm birth, low birth weight, caesarean section rates, and postpartum depression. Group antenatal care was not harmful, but further investigations are needed to establish its benefits.

Keywords: Group antenatal, group prenatal, preterm birth, birth weight, meta-analysis

Introduction

Antenatal care (ANC) is one of the priorities for any healthcare system, as it aims to promote good health of both the mother and the baby [1], it is considered an important form of preventive medicine for their wellbeing [2]. Substantial evidence indicates the importance of ANC, since early ANC provides an opportunity to identify and intervene with risk factors [3], and offer educational and psychosocial support for the expecting mother [4]. Traditionally, ANC is provided by mid-wives or other trained healthcare providers, on a one-to-one basis, and is recommended to take place monthly till 28 weeks of gestation, then bi-weekly till 36 weeks [5, 6]. This traditional model of care suffers numerous shortcomings, such as the limited time spent with the care provider leaving little room to address important educational issues such as breastfeeding, contraception, anxiety, and fear experienced by the mother [7]. Furthermore, minority and vulnerable ethnic or socioeconomic groups are less likely to receive ANC, due to limitations imposed by cost, transportation, or perceived trivial significance of ANC, this underutilization of ANC has been associated with adverse perinatal outcomes [2, 8].
Consequently, a novel model of providing ANC in groups has emerged, and is being implemented in USA and several European countries (1). Several group ANC models exist, and with minor differences they incorporate the provision of ANC in groups of 8-12 women, usually of similar gestational age, each group session lasts for 1.5 to 2 hours [1, 9]. Models of group ANC attempt to incorporate continuity of care, and adopt a woman-centered philosophy [10]. The best described and studied model of group ANC the "CenteringPregnancy®" implemented in USA is founded on three cornerstones of assessment, education, and support, with a focus on nutrition,

exercise, awareness, and particularly social support [7], since evidence point out social support as a significant protector against post-partum depression [11, 12].

Group ANC is reported to have the potential to promote the wellbeing of the mother and baby through promoting empowerment of women by taking a more active role in their own care, and encouraging self-monitoring practices (measuring own blood pressure for example), which in turn may increase their confidence and alleviate their fear, resulting in a better birth experience [1, 13].

However, objective maternal and fetal benefits have not been rigorously tested [14], with conflicting available evidence. Some reports found significant reduction of preterm birth (PTB), and increased initiation of breastfeeding compared to traditional ANC [15, 16], whereas others failed to establish any differences [17, 18]. This uncertainty is clearly observed in the statement of the American College of Obstetricians and Gynecologists (ACOG) about group ANC [19], where they cautiously declare group ANC beneficial but do not mandate it.

Hence, we conducted this systematic literature review and meta-analysis on recent randomized clinical trials (RCTs) to explore possible objective improvement of fetal and maternal outcomes due to group ANC.

Methods

We conducted this systematic literature review and meta-analysis in alignment with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [20].

Inclusion and exclusion criteria

We included only RCTs, and excluded any other study designs such as observational studies, we also excluded conference proceedings, poster presentations, and qualitative reports. The base of randomization in included studies could be the individual person or the facility providing the care (cluster randomization), however, the unit of analysis must have been the individual woman. Included articles must have compared group ANC to individual based ANC, accordingly, we excluded articles if they compared two different models of group ANC, or a group ANC model to itself with the addition of a component. Finally, an included article may have been a secondary analysis as long as the data was collected in a RCT and the outcome was not previously reported in another included article.

Review outcomes

Included studies must have reported at least one of the review's defined outcomes. The primary outcome was PTB: as a binary outcome, defined as gestational age < 37 weeks. Secondary outcomes included: Low birth weight (LBW), as a binary outcome, defined as less than 2500 grams. Postpartum initiation of breastfeeding, as a binary outcome, regardless of the postpartum duration at which data was obtained. Occurrence of unplanned caesarian section (CS) as a binary outcome. And Edinburgh Postnatal Depression Scale (EPDS) as a continuous variable, measured 4-6 weeks postpartum.

Search strategy

We systematically searched PUBMED and EMBASE databases for eligible studies, using the search terms: "antenatal care", ante natal care", "ante-natal care", "prenatal care", "pre-natal care", "pre-natal care", separately and in combination with the term "group".

To include recent trials, our search was conducted from inception to 2015, without restrictions to languages.

Study inclusion and data extraction

After exclusion of articles by title or abstract and removal of duplicates, full texts of potentially eligible articles were retrieved. At least two authors reviewed each article independently to decide if it met inclusion criteria and to extract data on a pre-prepared pro forma. Extracted data included: Sur name of first author, study year and country or countries, unit of randomization (individual or cluster), description of the intervention, inclusion and exclusion criteria, and outcome or outcomes of interest reported by the study and their relative numerical values. Conflict about inclusion of an article was resolved by discussion and consensus among all authors.

Risk of Bias assessment

Based on the recommendation of the Cochrane Handbook for Systematic Reviews of Interventions [21], we utilized RevMan® built in risk of bias (RoB) assessment tool. The tool assesses RoB in each included study in 7 domains (random sequence generation, allocation concealment, blinding of participants, blinding of assessors, attrition bias, selective reporting bias, and other sources of bias). Each domain can be evaluated as low, unclear, or high risk of bias.

Statistical method of meta-analysis

A meta-analysis was performed for an outcome if at least two studies reported that outcome, otherwise, only a descriptive data synthesis was presented. In view of the different models of group ANC applied in diverse populations identified in our literature review of the topic, we anticipating between studies heterogeneity. Accordingly, we decided on utilizing random effects models for all outcomes of the meta-analyses. We reported all comparisons of binary outcomes as relative risk (RR), and continuous outcomes as mean difference (MD), along with their corresponding 95% confidence interval (CI) and p value.

Publication bias assessment

We performed publication bias assessment only for the primary outcome, and graphically presented it as a funnel plot along with the corresponding p value of Egger's test for small study effect, for which the null hypothesis is no publication bias. All statistical tests and graphs were generated using Review Manager (RevMan) [Computer program]. Version 5.3. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2014.

Results

Our initial PUBMED search yielded 1519 results, of which 1480 articles were excluded by title or abstract. The full text of 39 articles were retrieved and reviewed by authors. Thirty-two articles were excluded for various reasons. No unique results were obtained from EMBASE search. Seven articles were included in the review [22-28]. Figure 1 presents PRISMA flow diagram of study inclusion and exclusion.

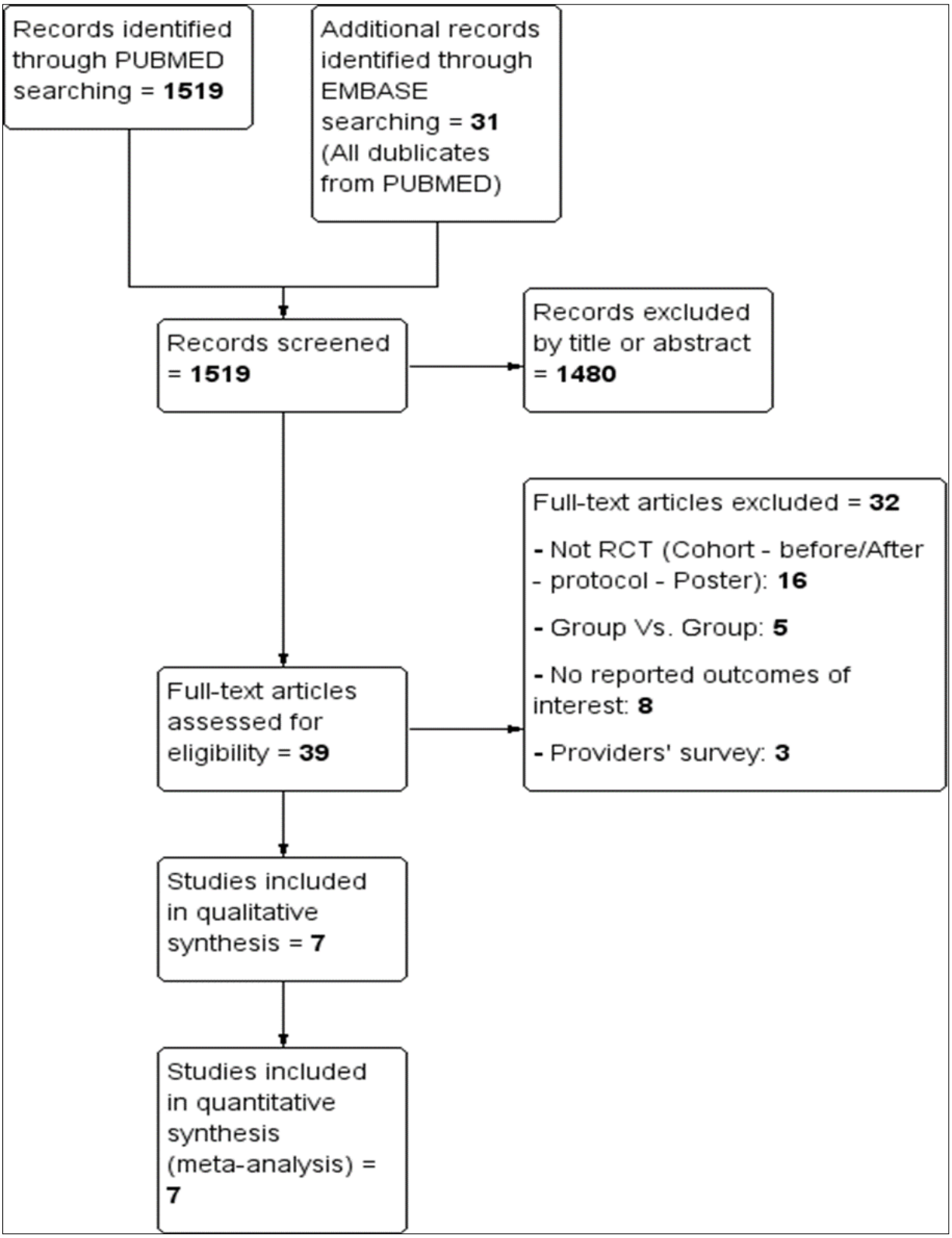


Fig 1: PRISMA flow graph of included studies

Characteristics if included studies

The included seven RCTs enrolled a total of 12,859 patients (6765 women in the intervention arms, and 6094 in the control arms). Included studies were conducted in USA [22-26], Rwanda [27], Turkey [28], and in both Malawi and Tanzania [24]. In four studies [22-25] the intervention was the well-established model of group ANC "Centering Pregnancy", it involves groups of 8 to 12 pregnant patients expected to deliver in the same month, scheduled for ten 2- hour Group ANC sessions.

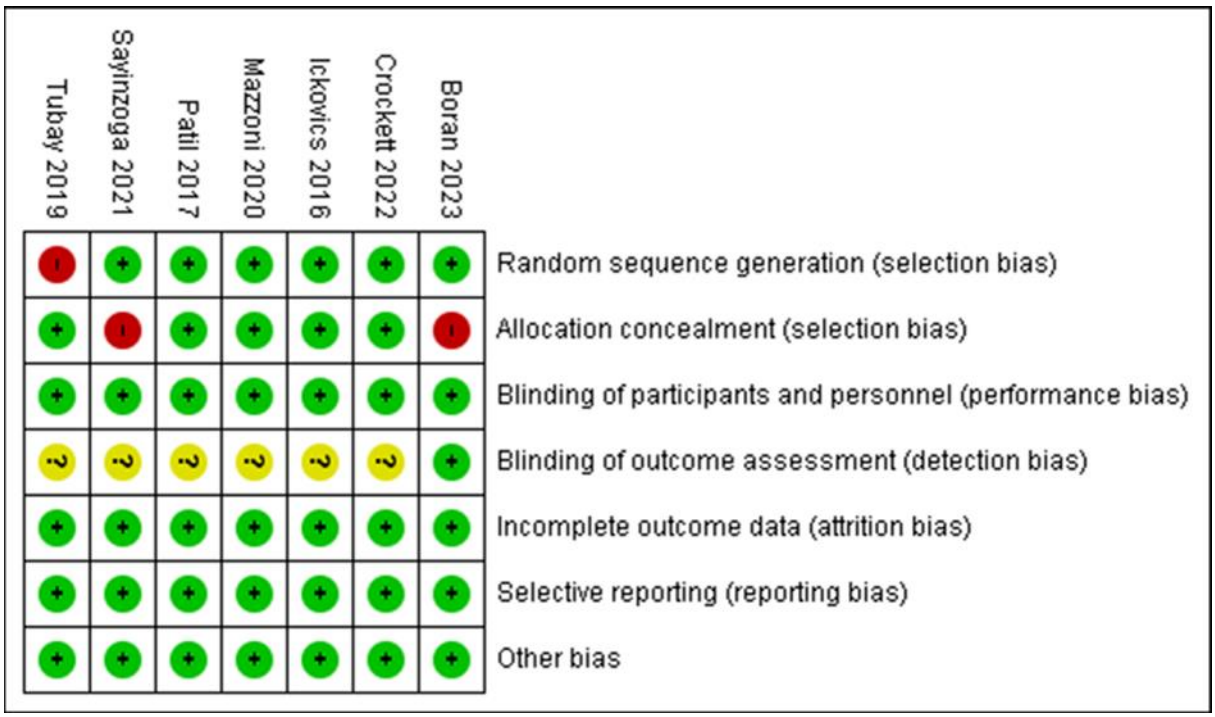
In two studies [26, 27] group visits were 1.5–2 hours every 2 weeks in a continuous cycle through a four-session curriculum focusing on pregnancy, diabetes, and mental health. Group visits included 2–10 women, but group members may change in one study [26]. The intervention of the last study included in addition to the group ANC online educational meetings [28]. Table 1 shows the characteristics of included studies.

Table 1: Characteristics if included studies

Study	Country	Design	Intervention	Inclusion	Exclusion
Crockett *et al.* 2022 [22]	USA	RCT – Single center	Centering Pregnancy	Age: 14 to 45, singleton, less than 24 weeks gestation	Medical or pregnancy complications, severe obesity (body mass index of >50 kg/m2). Anticipated preterm delivery, cerclage were excluded. Patients with medical, social, or behavioral conditions that would preclude group participation.
Ickovics *et al.* 2016 [23]	USA	Cluster randomized (14 centers)	Centering Pregnancy + HIV education	Age: 14 to 21, less than 24 weeks gestation, low risk pregnancy, ability to speak English or Spanish.	
Patil *et al.* 2017 [24]	Malawi - Tanzania	Multi-center randomized pilot	Centering Pregnancy	At least 16 years with a pregnancy of 20–24 weeks.	
Tubay *et al.* 2018 [25]	USA	RCT, military personnel	Centering Pregnancy	Age: 18 or more, military personnel or dependent of, gestational age 18 weeks or less.	Expected to change duty stations during the pregnancy, could not read or write English. High-risk patients were not specifically excluded.
Mazzoni *et al.* 2018 [26]	USA	Two-center pilot randomized	4 sessions, 1.5 to 2 hours, 2 – 10 women.	Type 2 or gestational diabetes, ability to attend group prenatal visits at specified days and times, randomization at 22 or 32 weeks, or initial visit between 24 and 34 weeks, and ability to give informed consent.	Type 1 diabetes, multiple gestation, major fetal anomaly, serious medical or psychiatric comorbidity.
Sayinzoga et a 2021 [27]	Rwanda	Un-blinded cluster randomized, 36 centers	8 to 12 women with similar due dates, three subsequent scheduled group antenatal visits at eight-week intervals.	All pregnant women presenting for their first antenatal visit	Unrectified records were excluded
Boran *et al.* 2023 [28]	Turkey	Mixed method pilot randomized	GANC + online education: Thinking healthy program. 8-10 women. 5 sessions	Age: 18 years or over; Gestation: 12-30 weeks, intending to attend all 5 on-line sessions	Receiving mental health care or reported suicidal ideation.

Risk of bias assessment

We detected a high RoB with regards to random sequence generation in one study [25], because patients were being randomized according to odd or even expected month of delivery. Allocation concealment had a high RoB in two studies [2, 28] because patients were told their allocation group. Unclear RoB was judged for all studies except one [28] with regards to assessors' blinding, because it was not clearly stated. Figure 2A and B depict the RoB assessment.



B: Risk of Bias graph

Fig 2: A: Risk of Bias summary

Publication bias assessment

Figure 3 depicts the contour enhanced funnel plot of publication bias for the primary outcome (PTB), the p-value of Egger's test for small study effect was 0.6, indicating that the meta-analysis does not suffer publication bias.

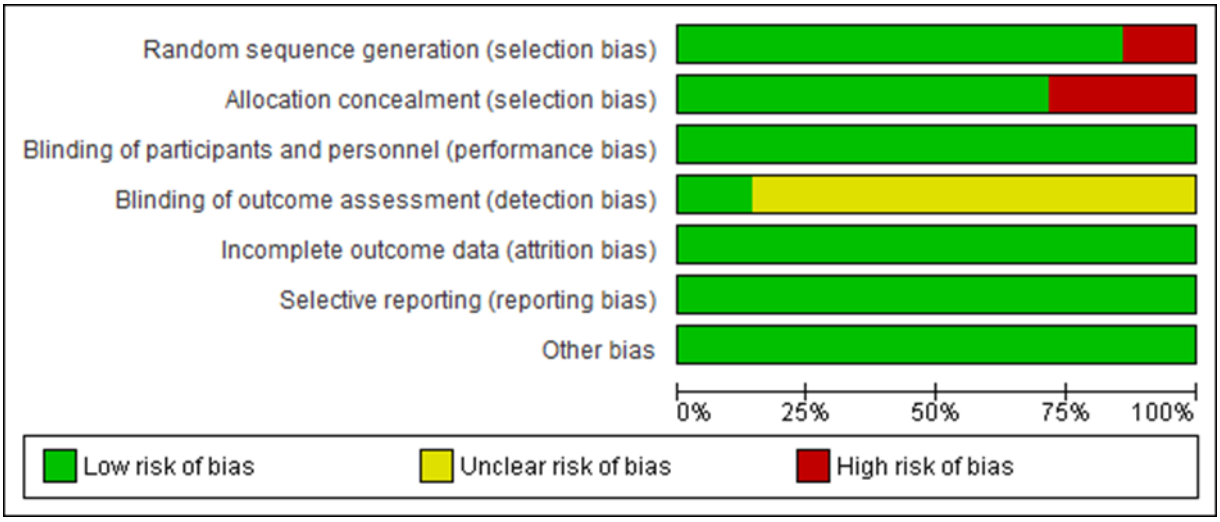


Fig 3: Publication bias funnel plot

Review outcomes (Figure 4)

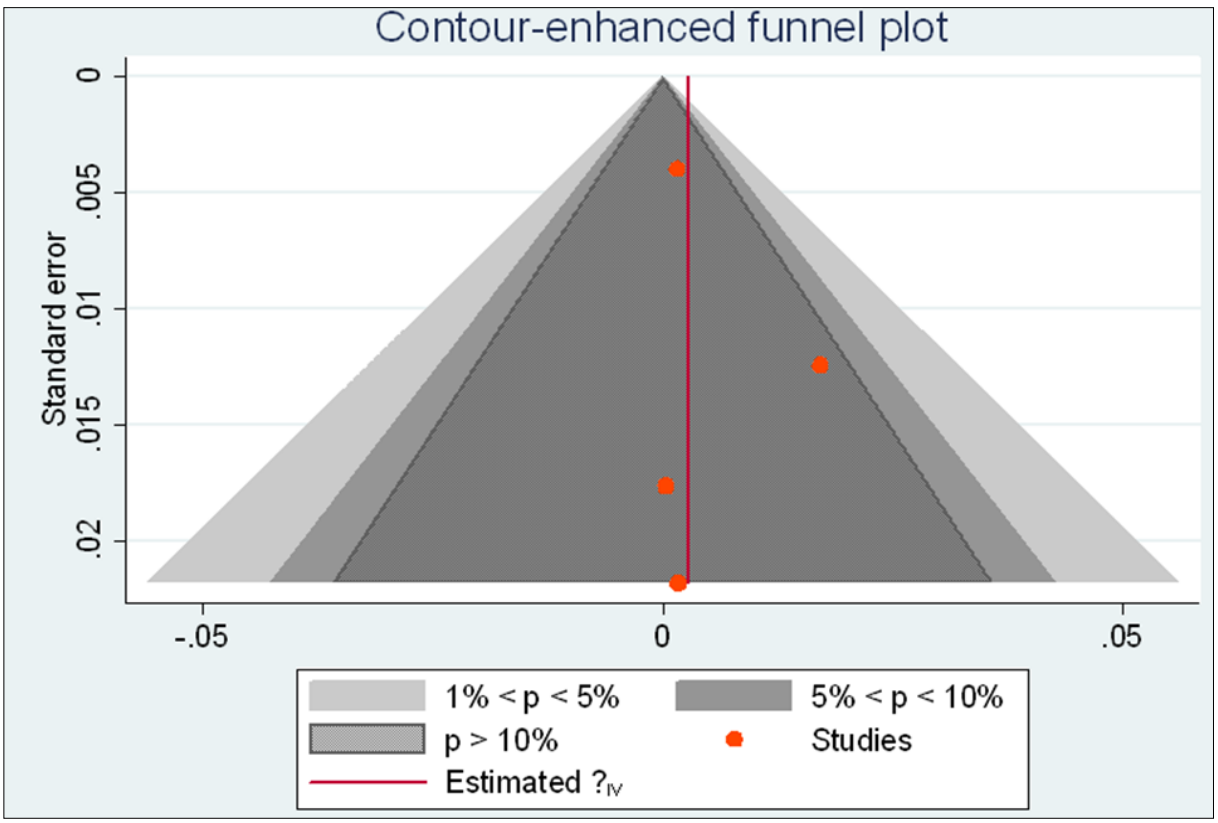
PTB (defined as labor before 37 weeks of gestation was reported in four studies [22, 23, 25, 27] and the pooled data of a total 12,338 patients was not statistically significant for the reduction of PTB by group ANC (RR = 1.09 [95% CI: 0.93-1.26]; p = 0.28).

LBW as a binary outcome (less than 2500 grams) was reported by two studies [22, 23] and the meta-analysis showed that its risk was not significantly reduced by the intervention (RR = 1 [95% CI: 0.81-1.25]; p = 0.97).

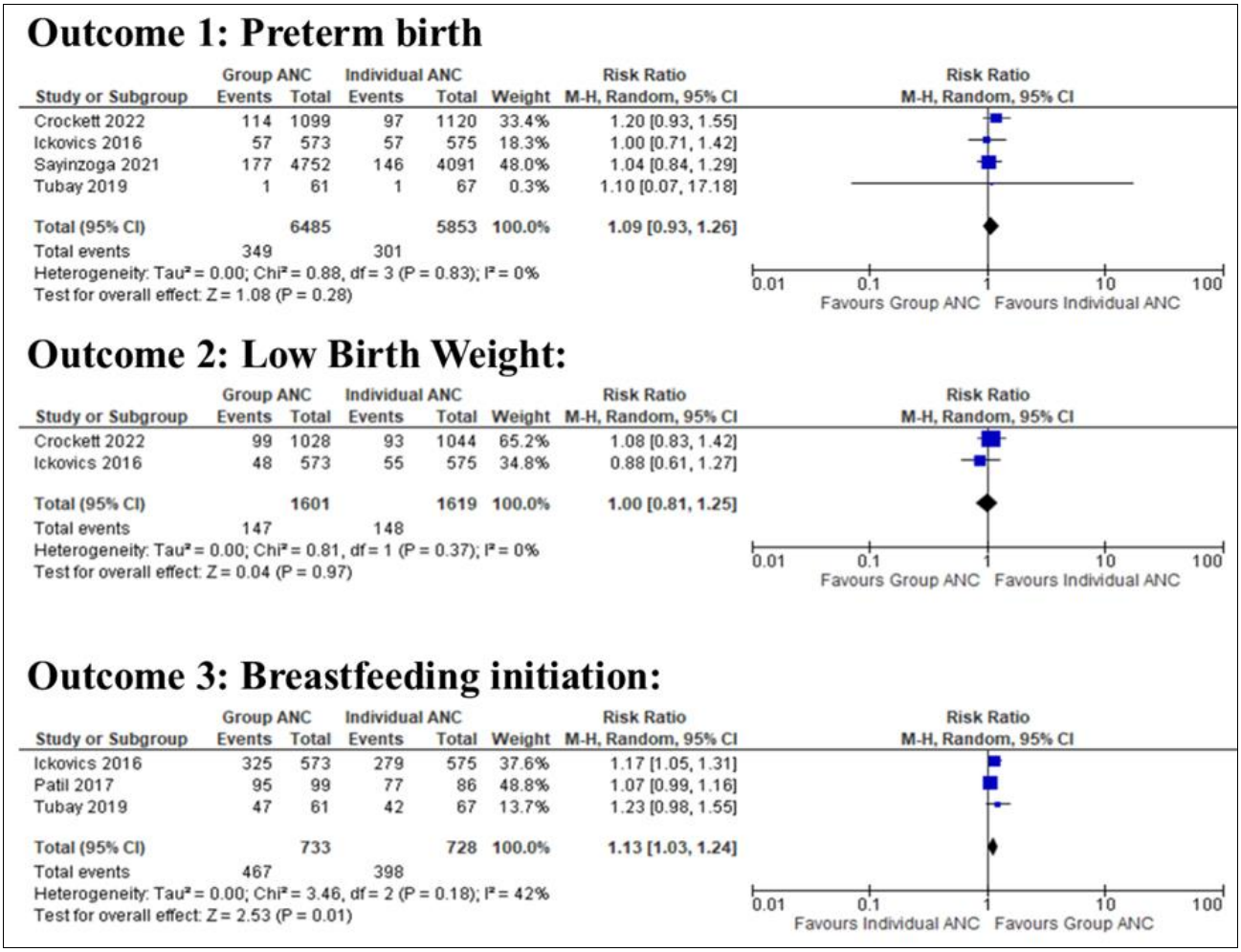
The meta-analysis of breastfeeding initiation indicated a statistically significantly higher chance of initiating breastfeeding for women in the group ANC arm (RR = 1.13 [95% CI: 1.03-1.24]; p = 0.01), this outcome was reported by three studies [23-25]. However, the certainty of evidence was downgraded twice to low grade, for inconsistency and discrepancy (table 2).

The risk of unplanned CS was not affected by the intervention, as indicated by the meta-analysis that included two articles [25, 27], in the meta-analysis, RR was 1.1 (95% CI: 0.98 – 1.24; p = 0.1).

Finally, the mean difference of EPDS was also not statistically significant in the last meta-analysis including two studies [26, 28], the mean difference of pooled data was -0.14 (95% CI: -1.42 to 1.14; p = 0.83).



Egger's test p value = 0.6



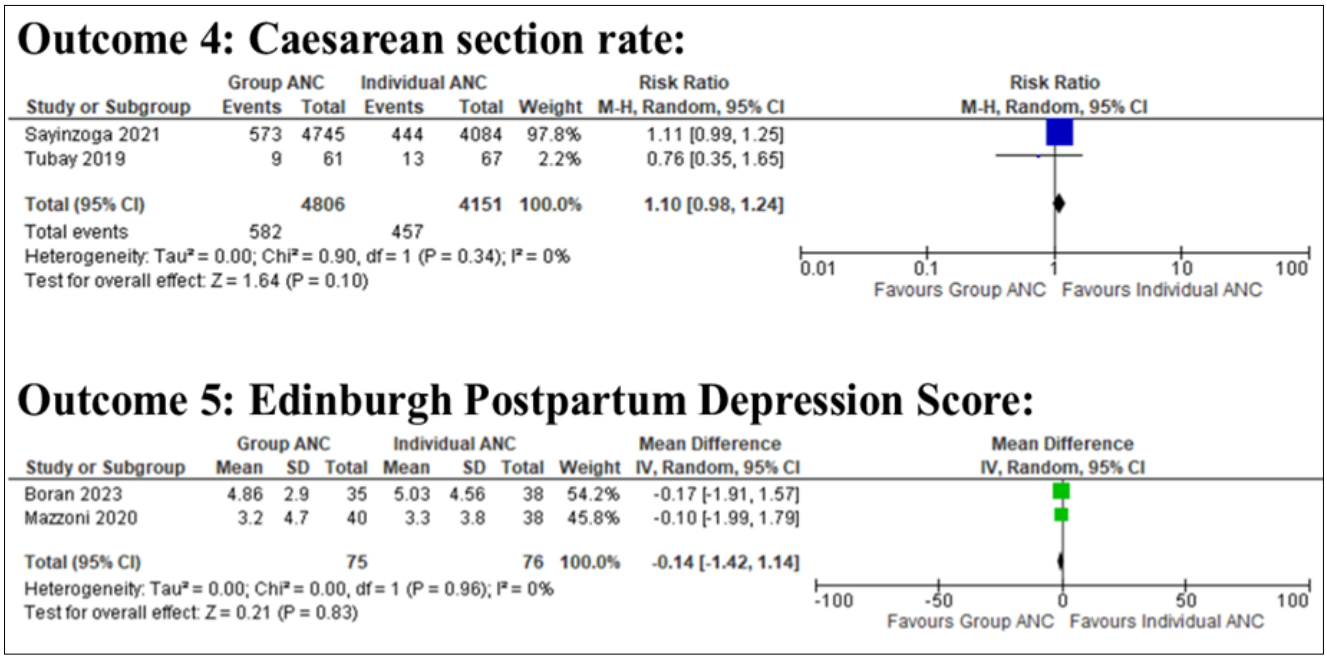


Fig 4: Meta-analyses of outcomes

Discussion

Our systematic literature review and meta-analysis of RCTs comparing group ANC to individual ANC indicates that the intervention resulted in significant increase in the chance of initiating breastfeeding after labor with low grade certainty of evidence, however, it did not result in reduction of the risk of PTB, LBW, CS, or postpartum depression scores.

The majority of the included studies utilized Centering Pregnancy model, and those that didn't, used a very similar approach. This may explain the results of our meta-analysis in view of the structure of the Centering Pregnancy model. Centering Pregnancy model of care revolves around empowerment of pregnant ladies, incorporating three main components, namely risk assessment, education, and support [29].

Consequently, an outcome such as initiation of breastfeeding is expected to improve as a result of group ANC since this is a decision made by the mother, and is probably influenced by education. On the other hand, outcomes that could not be influenced by education or support are logically not expected to vary between the two models. Such outcomes may include PTB, LBW, and CS. Postpartum depression may be expected to improve as a result of education and support, however, in our meta-analysis there was no difference in mean EPDS measured at 4-6 weeks postpartum. This result may not be conclusive because only two RCTs were included in the meta-analysis, and the small sample size could have rendered the result underpowered.

In the review by Catling *et al.* [30] no statistically significant differences were observed between women who received group ANC and individual ANC for PTB and LBW. Similar results were reported by two other reviews [2, 7] for PTB, while the lower rate of LBW reported by Carter *et al.* [7] was not found among RCTs. Reduction of LBW rates were reported by others [14], although among special populations of pregnant women, in a review that mostly included observational studies. Darling *et al.* [2] similarly report lack of difference between groups with regards to rates of CS.

Participation in group ANC significantly increased rates of breastfeeding initiation by 53% among the general population [31], as well as among adolescent and African American women [14]. Increased rates of breastfeeding initiation didn't reach the level of statistical significance in the review by Catling *et al.* [30]. As for the insignificant reduction of mean EPDS, a similar finding was reported in another review [5] that evaluated postpartum depression using various scales, and across different study designs.

Our results are not unique compared to findings of previous literature reviews on the topic, and could be considered as an update and confirmation of previous results. Perhaps the most obvious conclusion is that the evidence is conflicting and are inconsistent which precludes a decisive conclusion. To the credit of group ANC, it was not found to be harmful, as clearly stated in ACOG committee opinion [19]. However, there is a clear need for further investigation into the effect of group ANC with rigorous study designs.

Limitations

Our review suffers numerous limitations. First, few studies met the inclusion criteria and were included in the meta-analyses, this probably under-powers our results. Second, we only investigated a few possible outcomes leaving out many others, because we evaluated the most objective outcomes, while avoiding self-reported outcomes as they are prone to recall bias. Third, we included studies as of 2015, leaving out numerous earlier studies, as we intended this review to act as an update of previous reviews.

Conclusion

This systematic literature review and meta-analysis concludes that group ANC increased the chance of breastfeeding initiation, but had no effect on PTB, LBW, CS rates, and postpartum depression. The results are inconclusive, and further investigations are warranted.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Wiggins M, Sawtell M, Wiseman O, *et al.* Group antenatal care (Pregnancy Circles) for diverse and disadvantaged women: study protocol for a randomised controlled trial with integral process and economic evaluations. BMC Health Serv Res. 2020;20:919.
2. Darling EK, Kjell C, Tubman-Broeren M, Marquez O. The Effect of Prenatal Care Delivery Models Targeting Populations with Low Rates of PNC Attendance: A Systematic Review. J Health Care Poor Underserved. 2021;32(1):119-136.
3. Shah JS, Revere FL, Toy EC. Improving Rates of Early Entry Prenatal Care in an Underserved Population. Matern Child Health J. 2018 Dec;22(12):1738-1742.
4. Gadson A, Akpovi E, Mehta PK. Exploring the social determinants of racial/ ethnic disparities in prenatal care utilization and maternal outcome. Semin Perinatol. 2017 Aug;41(5):308– 17.
5. Buultjens M, Farouque A, Karimi L, Whitby L, Milgrom J, Erbas B. The contribution of group prenatal care to maternal psychological health outcomes: A systematic review. Women Birth. 2021 Nov;34(6):e631-e642.
6. American Academy of Pediatrics, American College of Obstetricians and Gynecologists. Guidelines for perinatal care. 7th. Elk Grove Village (IL): AAP; c2012. p. 106. Washington, DC: American College of Obstetricians and Gynecologists.
7. Carter EB, Temming LA, Akin J, Fowler S, Macones GA, Colditz GA, *et al.* Group prenatal care compared with traditional prenatal care: A Systematic Review and Meta-analysis. Obstet Gynecol. 2016 Sep;128(3):551-61.
8. Green TL. Unpacking Racial/ ethnic disparities in prenatal care use: the role of individual-household-, and area- level characteristics. J Womens Health (Larchmt). 2018 Sep;27(9):1124-34.
9. Jones RH, Murrells T, Sandall J. An investigation of the relationship between the caseload model of midwifery for socially disadvantaged women and childbirth outcomes using routine data: A retrospective, observational study. Midwifery. 2015;31(4):409–17.
10. Homer CS. Models of maternity care: Evidence for midwifery continuity of care, Med. J Aust. 2016;205(8):370–374.
11. Reid KM, Taylor MG. Social support, stress, and maternal postpartum depression: A comparison of supportive relationships. Soc Sci Res. 2015 Nov;54:246-62.
12. Hunter LJ, Da Motta G, McCourt C, Wiseman O, Rayment JL, Haora P, *et al.* Better together: A qualitative exploration of women's perceptions and experiences of group antenatal care using focus groups and interviews. Women Birth. 2019;32(4):336–45.
13. Magriples U, Boynton MH, Kershaw TS, Lewis J, Rising SS, Tobin JN, *et al.* The impact of group prenatal care on pregnancy and postpartum weight trajectories. Am J Obstet Gynecol. 2015 Nov;213(5):688.e1-9.
14. Byerley BM, Haas DM. A systematic overview of the literature regarding group prenatal care for high-risk pregnant women. BMC Pregnancy Childbirth. 2017;17:329.
15. Tanner-Smith EE, Steinka-Fry KT, Lipsey MW. The effects of Centering Pregnancy group prenatal care on gestational age, birth weight, and fetal demise. Maternal and Child

Health Journal. 2014;18(4):801–9.
16. Picklesimer ABD, Kolb CS, Hale N, Billings D. The impact of Centering Pregnancy group prenatal care on preterm birth in a low-income population. American Journal of Obstetrics and Gynecology. 2012;206(1):S55–S6.
17. Shakespear K, Waite PJ, Gast J. A comparison of health behaviors of women in centering pregnancy and traditional prenatal care. Maternal and Child Health Journal. 2010 Mar;14[2):202–8.
18. Klima C, Norr K, Vonderheid S, Handler A. Introduction of Centering Pregnancy in a public health clinic. Journal of midwifery & women's health. 2009 Jan-Feb;54(1):27–34.
19. ACOG Committee Opinion No. 731 Summary: Group Prenatal Care. Obstet Gynecol. 2018 Mar;131(3):616-618.
20. 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. BMJ. 2021 Mar 29;372:71.
21. Higgins JPT, Altman DG, Sterne JAC (editors). Chapter 8: Assessing risk of bias in included studies. In: Higgins JPT, Churchill R, Chandler J, Cumpston MS (editors), Cochrane Handbook for Systematic Reviews of Interventions version 5.2.0 (updated June 2017), Cochrane, 2017. Available from www.training.cochrane.org/handbook.
22. Crockett AH, Chen L, Heberlein EC, Britt JL, Kolb CS, Witrick B, *et al.* Group vs traditional prenatal care for improving racial equity in preterm birth and low birthweight: The Centering and Racial Disparities randomized clinical trial study. Am J Obstet Gynecol. 2022;227(6):893.e1-893.e15.
23. Ickovics JR, Earnshaw V, Lewis JB, Kershaw TS, Magriples U, Stasko E, *et al.* Cluster Randomized Controlled Trial of Group Prenatal Care: Perinatal Outcomes Among Adolescents in New York City Health Centers. Am J Public Health. 2016;106(2):359-65.
24. Patil CL, Klima CS, Steffen AD, Leshabari SC, Pauls H, Norr KF. Implementation challenges and outcomes of a randomized controlled pilot study of a group prenatal care model in Malawi and Tanzania. Int. J Gynaecol. Obstet. 2017;139(3):290-296.
25. Tubay AT, Mansalis KA, Simpson MJ, Armitage NH, Briscoe G, Potts V. The Effects of Group Prenatal Care on Infant Birthweight and Maternal Well-Being: A Randomized Controlled Trial. Mil Med. 2019;184(5-6):e440-e446.
26. Mazzoni S, Hill P, Briggs A, Barbier K, Cahill A, Macones G, *et al.* The effect of group prenatal care for women with diabetes on social support and depressive symptoms: a pilot randomized trial. J Matern. Fetal Neonatal Med. 2020;33(9):1505-1510.
27. Sayinzoga F, Lundeen T, Musange SF, Butrick E, Nzeyimana D, Murindahabi N, *et al.* Assessing the impact of group antenatal care on gestational length in Rwanda: A cluster-randomized trial. PLoS One. 2021;16(2):e0246442.
28. Boran P, Dönmez M, Barış E, Us MC, Altaş ZM, Nisar A, *et al.* Delivering the Thinking Healthy Programme as a universal group intervention integrated into routine antenatal care: A randomized-controlled pilot study. BMC Psychiatry. 2023;23(1):14.
29. Rising SS. Centering pregnancy. An interdisciplinary model of empowerment. J Nurse Midwifery. 1998 Jan-Feb;43(1):46-54.
30. Catling CJ, Medley N, Foureur M, Ryan C, Leap N, Teate A, *et al.* Group versus conventional antenatal care for women. Cochrane Database Syst Rev. 2015 Feb 4;2015[2):CD007622.
31. Robinson K, Villarreal GM, Hanson L. Effectiveness of Centering Pregnancy on Breastfeeding Initiation Among African Americans: A Systematic Review and Meta-analysis. J Perinat Neonatal Nurs. 2018 Apr/Jun;32(2):116-126.

How to Cite This Article
Hamido HM, Alshitwi AI, Almadani HI, Alkhodairi S, Alharfi S, Unnais B, Alhazmy A. Impact of group antenatal care on fetal and maternal outcomes, systematic literature review and meta-analysis of recent randomized clinical trials. International Journal of Clinical Obstetrics and Gynaecology. 2023;7(6):35-43.