

The Effect of Postpartum Depression on Infant Feeding Practice in Sub-Saharan African Countries: Systematic Review and Meta-analysis

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Abstract

Background: Postpartum depression (PND) is a type of mood disorder that affects women after childbirth. Despite the detailed research related to these maternal and infant health outcomes, the relationship between postpartum depression and infant breastfeeding remains ambiguous. Hence, the aim of this study was to assess the effect of maternal postpartum depression on infant feeding practice in Sub-Saharan African Countries.

Method: This systematic review and meta-analysis was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis. PubMed, Google Scholar, Science Direct and Cochrane Library were systematically searched for relevant articles. STATA version 14 was used to calculate the pooled effect size with 95% confidence intervals (95% CI) of postpartum depression on infant feeding practice using the DerSimonian and Laird random effects meta-analysis. The heterogeneity and publication bias was assessed by using I^2 test statistics and Egger's test respectively.

Result: Total of 1058 published and unpublished article were retrieved from different data bases. Finally four studies fulfilled the inclusion criteria for this systematic review and meta- analysis. This meta-analysis found that postpartum depression has no significant effect on the infant feeding practices (OR = 0.46, 95% CI: 0.18, 1.14).

Conclusion: We did not find sufficient evidence to conclude the effect of postpartum depression on infant feeding practice. Thus, the investigators strongly recommend the researchers to conducted randomised control trail studies in Sub-Sahara African countries.

Background

Postpartum depression is a type of depression experienced by a mother following childbirth, typically arising from the combination of hormonal changes, psychological adjustment to motherhood and fatigue (1). Among highly devastating psychological disorders depression is estimated to affect 350 million people worldwide. It is a common mental health disorder which is estimated to affect 10–15% of all mothers in the postpartum period (1-3).

Studies found that in the first three months after childbirth, 14.5% of women have an episode of minor or major depression with nearly 40% of these women having experienced symptoms during pregnancy (4, 5).

Postpartum depression has a considerable burden on partners and close family members, affecting social and leisure activities and causing financial problems within the family. Also, postpartum depression has an adverse effect on the marital relationship (6-8).

There has been significant research in developed countries on the risk factors for postpartum depression. Meta-analyses of these studies have identified past history of psychopathology, emotional disturbance

during pregnancy, difficult marital relationships, inadequate social support and stressful life events as the primary risk factors for developing postnatal depression (7, 9).

Mothers with postpartum depression are more likely to have an unhealthy lifestyle, including poor diet and sleep patterns, compared to mothers free of postnatal depression (10-12). Women with postnatal depression tend to stop breastfeeding earlier than non-depressed mothers (13-15).

Despite some evidence of higher risk for depression, most low-income and ethnic minority women remain undiagnosed or untreated for postpartum depression (16). Postpartum depression is a significant public health concern with wide-ranging negative consequences for women and their children (17, 18).

Postpartum depression is associated with impairment of the mother-infant bond which can result in longer term disruption of the emotional and cognitive development of the infant (7). Mothers with postpartum depression may be less able to interpret and respond appropriately to infant signals; they show more negative than positive emotions toward their infants and are more intrusive in their interactions with their infants (19). In comparison, a study conducted in South Africa showed no clear effects of postnatal depression on infant feeding practice, although postnatal depression at two months was found to be associated with low infant weight at 18 months (20).

A study conducted in Malawi found a significant association of postpartum depression with infant feeding practice. All of the studies conducted in South Africa, Malawi and Ethiopia identified a high prevalence of postpartum depression (34%, 26% and 33%, respectively), but failed to identify significant associations between postpartum depression and infant feeding practice (20-22).

In Ethiopia, postpartum depression was not associated with adverse infant feeding practice in any aspects (23). Such conflicting results from primary studies, coupled with the absence of any systematic reviews focused on the effect of maternal postnatal depression on infant feeding practice in sub-Saharan African countries, indicate the need for clarification of the effects of maternal postnatal depression on infant feeding practice. A preliminary search for systematic reviews on this topic was performed in PubMed, CINAHL, DARE and PROSPERO. No existing systematic reviews that reported on the effect of maternal postpartum depression on infant feeding practice in sub-Saharan African countries were identified in these databases. Therefore, this systematic review seeks out the best available evidence regarding the effect of maternal postnatal depression on infant feeding practice in sub-Saharan African countries.

Methods

Search strategy

A three-step search strategy was used in this review. First, an initial limited search of MEDLINE/PubMed has been undertaken followed by an analysis of the text words contained in the title and abstract, and the index terms used to describe the article. A second search using all identified keywords

and index terms was undertaken across all included databases. Third, the reference list of all identified reports and articles was searched for additional studies. Studies published between 2001 and 2020 were considered for inclusion in this review, because in sub-Saharan Africa, there was no publication on effects of postpartum depression on infant feeding practice in Sub-Sahara Africa before 2001. The databases searched: PubMed, Google Scholar, Science Direct and Cochrane Library. The search for unpublished: MedNar and ProQuest. Initial keywords were: Postnatal, postpartum, depression, mental disorders and infant feeding practice. These keywords were used separately and/or in combination using Boolean operators like "OR" or "AND".

Study selection

Inclusion criteria

Types of Participants

This review included literatures (published and unpublished) reported mothers with infants aged one year or younger. And literatures reported mothers with infant who live in sub-Sahara African countries were included. Studies published in English language were considered for inclusion in this review. Mothers who have children with congenital abnormalities were excluded.

Types of exposure

This review was consider studies that examine the infant feeding practice whose mother has postpartum depression compared with the infant feeding practice of mothers who do not have postpartum depression. postpartum depression is defined as depression that starts within one month after childbirth and whose symptoms last more than two weeks. We can measure postnatal depression by using the Diagnostic and Statistical Manual of Mental disorders or Edinburgh Post-natal Depression Scale and self-reporting questionnaire-20. This review was exclude studies that have been conducted on mothers with preexisting psychological disorders.

Outcomes

This review considered studies that include the following outcome measures: infant feeding practices.

Types of studies

This review was considered both analytical and observational study designs: prospective and retrospective cohort studies, case control studies and analytical cross-sectional studies reporting association between postpartum depression and infant feeding practice.

Methodological quality

Articles selected for the inclusion was assessed by two independent reviewers for methodological quality before inclusion in the review using standardized critical appraisal instruments of Newcastle Ottawa

assessment tool (38, 39). Any disagreements that arise between the reviewers were resolved through discussion with a third reviewer.

Data extraction

Data extraction tool was prepared in Microsoft excel spreadsheet. The extracted data includes the specific details about the interventions, populations, study methods and outcomes of significance to the review question and specific objectives. The authors of primary studies were contacted by email in case there is incomplete information.

Data synthesis

Data was analyzed using STATA version 14. Before conducting the meta-analyses, heterogeneity was assessed using the standard I^2 and visual inspection of forest plot. Owing to the possibility of low power, if there are few studies, we used a significance level of $P < 0.1$ to protect against the possibility of falsely stating that there is no heterogeneity present. Effect sizes expressed as weighted mean differences (for continuous data) and their 95% confidence intervals was calculated. Effect sizes expressed as standardized mean differences and their 95% confidence intervals was calculated using the DerSimonian and Laird method. Moreover, odds ratio and their 95% confidence interval was be calculated.

Results

Characteristics of the Studies

Total of 1085 studies were retrieved from different data bases. **(Figure 1)** It has been reported according to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guideline (40). All duplicate articles ($n = 33$) were removed. From the remaining 1052 articles, 951 articles were excluded because their titles and abstracts were not in line with our inclusion criteria. Then, 137 articles were retrieved for abstracts, 125 articles were excluded after screening abstracts. Lastly, total of 12 full text studies were downloaded and assessed for eligibility criteria. Among accessed full text articles, eight articles were excluded because outcome of interests was not reported. Finally four articles were used for meta-analysis. Three of the studies employed cross-sectional study designs (25-27) whereas only one study was prospective cohort (24) with study population of 4153 from included studies. The minimum sample size for the included study was 159 (24) whereas the maximum sample size for the included study was 3494 both studies were from South Africa (25). **(Table 1)**

Table 1: Characteristics of studies included in the systematic review and meta-analysis on the effect of postpartum on infant feeding practice in Sub-Sahara Africa, 2001-2020

SN	Authors	Year of publication	Study design	Sample size	Country	Quality Assessment
1	Witten, CB (24)	2020	Prospective cohort	159	South Africa	7
2	Rohde SS.(25)	2005	Cross sectional	3494	South Africa	8
3	Madeghe, Beatrice A(26)	2016	Cross sectional	200	Kenya	7
4	Abdulai, H.(27)	2019	Cross sectional	300	Ghana	7

Effects of Postpartum depression on Infant feeding practice

This systematic review and meta-analysis assessed the effect of postpartum depression on the infant feeding practice. Heterogeneity was modern across studies ($I^2 = 75.1\%$, $p = 0.007$) which enabled us to use a random effects model. Using this method, our meta-analysis found that postpartum depression has no significant effect on the infant feeding (OR = 0.46, 95% CI: 0.18, 1.14). **(Figure 2)**

Heterogeneity and Publication Bias of included studies

We have tried to find the possible sources of heterogeneity using different statistical techniques. Publication year and sample size were used as covariates by Univariate meta-regression analysis. However, none of these variables were statistically significant for explaining heterogeneity **(Table 2)**.

The presence of publication bias was also assessed using funnel plot and Eggers' and Beggs' statistical tests at 5% significant level. The funnel plot shows a symmetrical distribution **(Figure 2)**. And the Egger and Beggs' tests showed no significant publication bias with p-values of 0.642 and 0.734 respectively. Therefore, publication bias is not a problem. The influence of a single study on the overall meta-analysis estimate was assessed by sensitivity analysis using a random effects model was performed. It revealed that no single study influenced the overall effect of postpartum depression on the infant feeding practice.

Table 2: Related factors with heterogeneity of the effects of postpartum depression on infant feeding practices in Sub Sahara Africa, 2001-2020

Variable	Coefficients	P-value
Year	0.3242194	0.227
Sample size	0.0004822	0.184

Discussion

By the year 2020, World Health Organization projected that depression will become the second cause of global disease burden (28). One in five women in low and middle income countries developed a postpartum depression according to reviews conducted in Low and Middle Income Countries (LMICS) and a review conducted in Africa (29, 30). Evidences showed that common mental disorders including depression during the postpartum period are more prevalent compared with non-pregnancy periods (31).

A study conducted in Malawi found the effect of postpartum depression with infant feeding practice. All of the studies conducted in South Africa, Malawi and Ethiopia identified a high prevalence of postpartum depression (34%, 26% and 33%, respectively), but failed to identify effect of postpartum depression on infant feeding practice (22-24). This showed that there is conflicting result seen for the effect of postpartum depression on infant feeding practice (17, 18). Hence, this systematic review and meta-analysis is perhaps the first of its kind to be conducted at the Sub Sahara Africa to examine the effect of postpartum depression on infant feeding practice.

This systematic review and meta-analysis revealed that postpartum depression has no significant effect on the infant feeding practice. This finding is in agreement with individual studies conducted in Republic of Korea (32), South Africa (24), Malawi (22), Ethiopia (23), Malaysia (33), Brazil (34), and Saud Arabia (35) whereas the finding of this study was in contrary to a qualitative systematic review (36), a study conducted in Saud Arabia (37) and a study conducted in Mexico (37). These disagreements could be result of socio demographic and socioeconomic differences between the countries. The other potential explanations for the observed differences might be the use of a different instrument to assess the effect of postpartum depression on the infant feeding practice. The difference of sample size and different study periods may be the additional causes for these variations. Because in the above studies the results were based on the individual study, but this systematic review and meta-analysis were pooled the effect of postpartum depression on the infant feeding practice based on the four studies conducted in different study area and periods. However, a study conducted in Canada showed that the effect of postpartum depression on infant feeding depends on the duration of infant feeding practices (14).

Limitations Of The Study

Maximum efforts have been made to include all published and unpublished articles from sub-Saharan African Countries. Moreover, three out of four included articles in this meta-analysis employed a cross-sectional study design. Chicken egg dilemma, therefore, cannot be shown in this review. Finally, we were unable to get studies from most of Sub Sahara African countries and this affects generalizability.

Conclusions And Recommendations

In Sub-Saharan Africa country, the studies conducted to assess effect of postpartum depression on infant feeding practice in Sub Sahara African were low in number. The current systematic review and meta-analysis based on existing studies revealed that postpartum depression has no significant effect on

infant feeding practice. Thus, the investigators strongly recommend to conduct randomized control trial in Sub-Sahara African countries.

Declarations

Ethics approval and consents to participation: Not applicable

Consent for publication: Not applicable

Availability of data and material

This study was based on literature review of published studies in Sub-Sahara Africa. Anyone who needs to access the data can contact the author concerning the studies included in the analysis. The reference list can also be used to directly access the articles.

Competing interests

The authors declare that they have no competing interests

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Not applicable

Authors' contributions

DW: Conception of research protocol, study design, literature review, data extraction, data analysis, interpretation and drafting the manuscript. DW: data extraction, quality assessment, data analysis and (BS, YT, and DE) reviewing the manuscript. All authors have read and approved the manuscript.

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Abbreviations

AOR: Adjusted Odd Ratio, PPD: Postpartum depression, PRISMA: preferred reporting items for systematic reviews and meta-analyses

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Figures

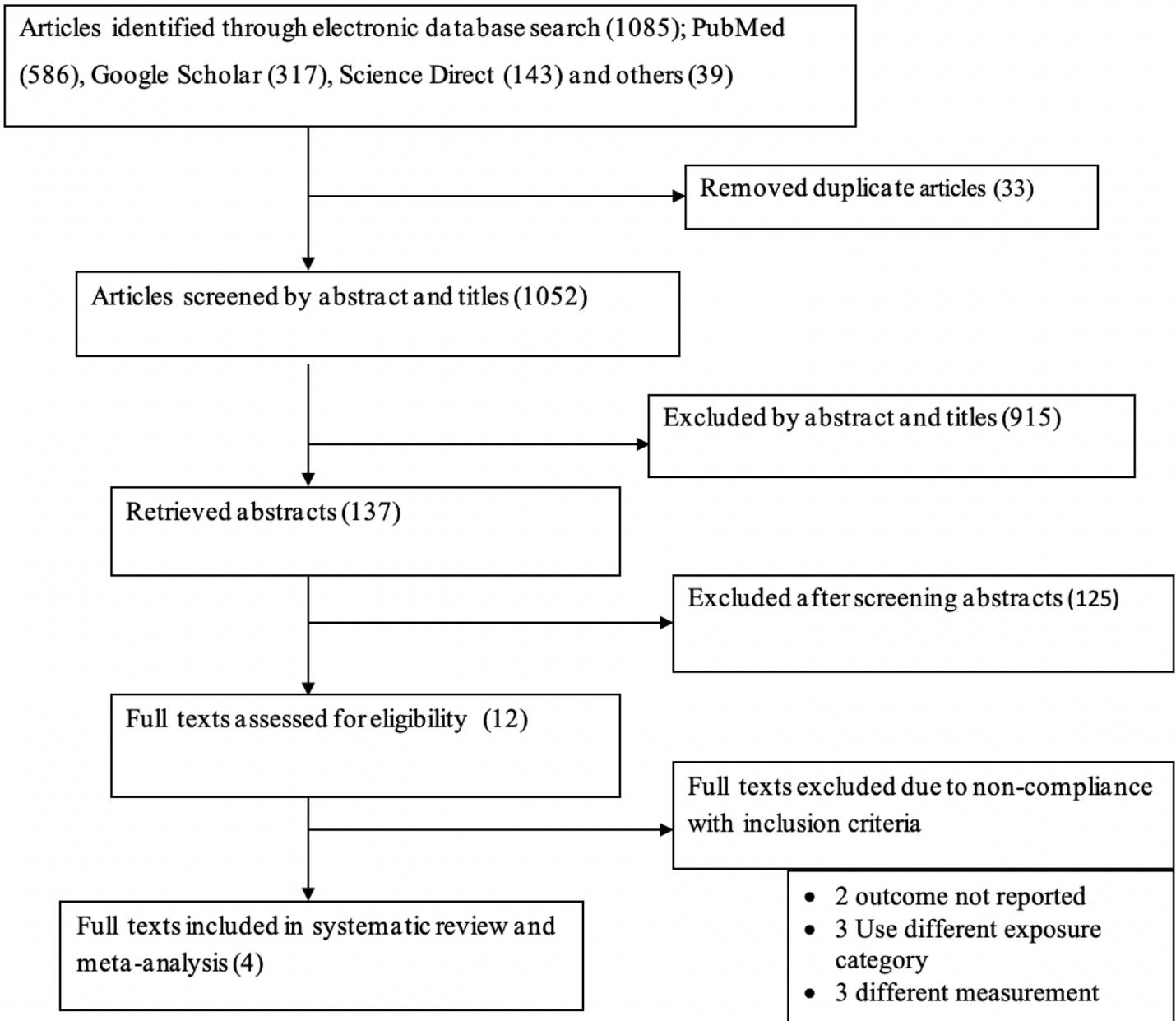


Figure 1

Flow diagram shows the studies selection of the meta-analysis of the effect of postpartum depression on infant feeding practice in Sub Saharan Africa, 2001-2020

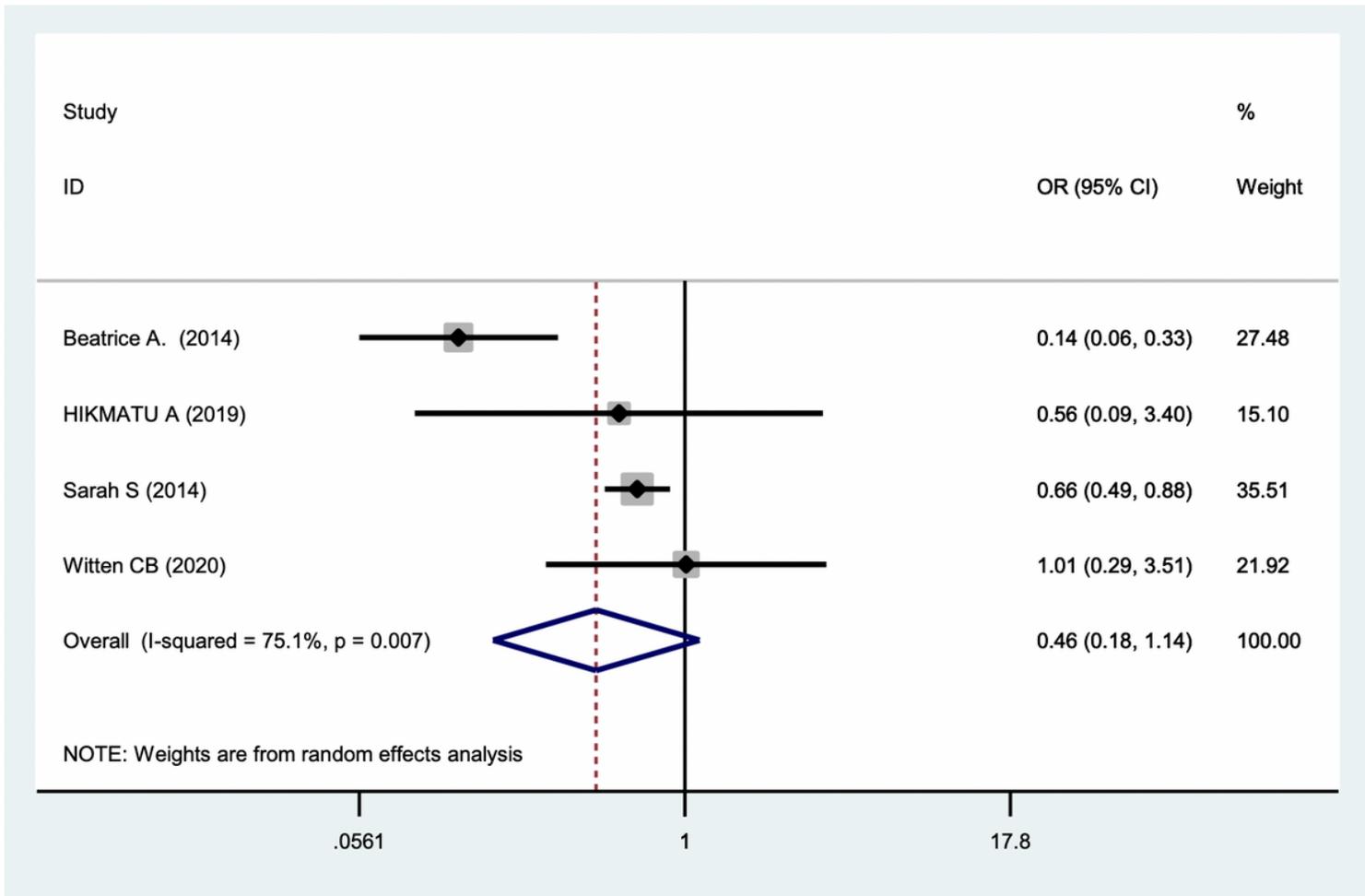


Figure 2

Forest plot of the pooled effect of postpartum depression on infant feeding practice in Sub Sahara Africa, 2001-2020

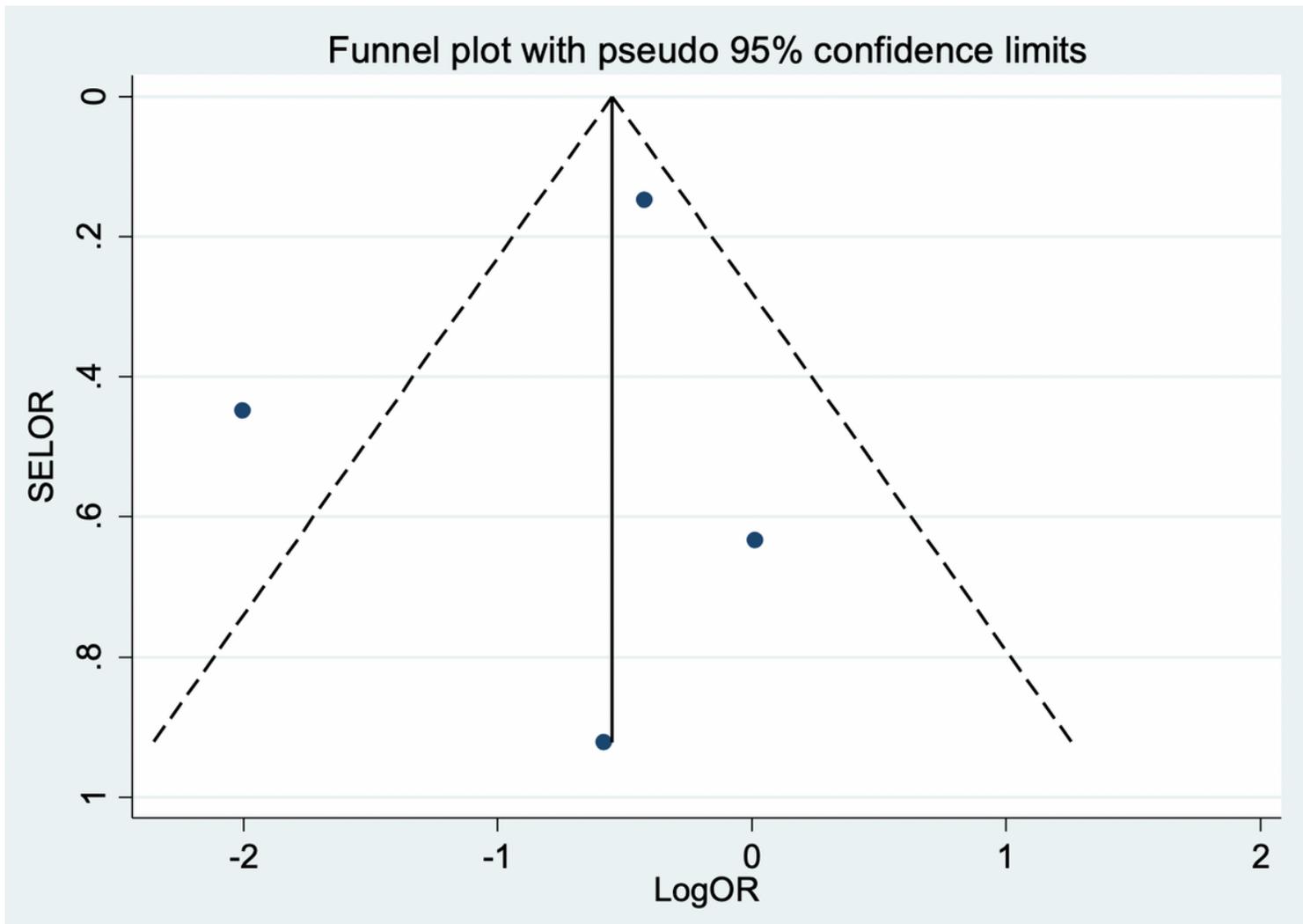


Figure 3

Funnel plot of on effect of postpartum depression on infant feeding practice in Sub Sahara Africa, 2001-2020