

ORIGINAL RESEARCH ARTICLE

The magnitude of episiotomy among women who gave birth in Ethiopia: Systematic review and meta-analysis

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Abstract

Episiotomy is one of the most common obstetric procedures done by health providers putting the client at high risk of developing complications and lacerations. These days, episiotomy has been done at an alarming rate in Ethiopia as compared to the slant set by World Health Organization. Be that as it may, there is a need for nationally representative data. This study aimed to determine the pooled prevalence of episiotomy practice among women who gave birth at public health institutions in Ethiopia. We accessed PubMed, Web of Science, Google Scholar, EMBASE, and manual search was used to retrieve articles. The extractions of the data were done by using Microsoft Excel and analyzed by STATA version 11 statistical software. The publication bias was checked by funnel plot visually and Egger's test and Begg's test, with $P < 0.05$ considered indicating potential publication bias. I^2 was used to check the presence of heterogeneity of the studies. Overall estimated analysis was done. Subgroup analysis was done by region. We carried out a leave-one-out sensitivity analysis. The Joanna Briggs Institute risk of bias assessment tool was used. Out of 254 articles retrieved, 9 studies met the eligibility criteria and are thus included in this study. The overall episiotomy practice in Ethiopia was 45.01% (95% CI: 36.288, 53.741). Based on the sub-group analysis, prevalence of episiotomy practice was 49.32% (95%CI: 12.67, 85.97), 46.92% (95%CI: 29.47, 64.37), 44.23% (95%CI: 37.77, 50.99) and 38.29 (95%CI: 32.38, 44.20) among South region, Addis Ababa, Amhara region and Tigray region respectively. The findings revealed that the prevalence of episiotomy practice in Ethiopia was high (45.01%). Therefore, it is better to have periodic training for birth attendants on the indication of episiotomy and the appropriate use of guidelines to reduce the rate of episiotomy. (*Afr J Reprod Health* 2022; 26[4]: 98-109).

Keywords: Episiotomy, practice, meta-analysis, Ethiopia, systematic review

Résumé

L'épisiotomie est l'une des procédures obstétriques les plus courantes pratiquées par les prestataires de santé, ce qui expose la cliente à un risque élevé de développer des complications et des lacérations. Ces jours-ci, l'épisiotomie a été pratiquée à un rythme alarmant en Éthiopie par rapport à l'inclinaison fixée par l'Organisation mondiale de la santé. Quoi qu'il en soit, il est nécessaire de disposer de données représentatives au niveau national. Cette étude visait à déterminer la prévalence groupée de la pratique de l'épisiotomie chez les femmes qui ont accouché dans des établissements de santé publique en Éthiopie. Nous avons accédé à PubMed, Web of Science, Google Scholar, EMBASE et une recherche manuelle a été utilisée pour récupérer les articles. Les extractions des données ont été faites en utilisant Microsoft Excel et analysées par le logiciel statistique STATA version 11. Le biais de publication a été vérifié visuellement par un graphique en entonnoir et par le test d'Egger et le test de Begg, avec $P < 0,05$ considéré comme indiquant un biais de publication potentiel. I^2 a été utilisé pour vérifier la présence d'hétérogénéité des études. Une analyse globale des estimations a été effectuée. L'analyse des sous-groupes a été effectuée par région. Nous avons effectué une analyse de sensibilité sans un. L'outil d'évaluation du risque de biais du Joanna Briggs Institute a été utilisé. Sur 254 articles récupérés, 9 études remplissaient les critères d'éligibilité et sont donc incluses dans cette étude. La pratique globale de l'épisiotomie en Éthiopie était de 45,01 % (IC à 95 % : 36,288, 53,741). D'après l'analyse en sous-groupe, la prévalence de la pratique de l'épisiotomie était de 49,32 % (IC à 95 % : 12,67, 85,97), 46,92 % (IC à 95 % : 29,47, 64,37), 44,23 % (IC à 95 % : 37,77, 50,99) et 38,29. (IC à 95 % : 32,38 ; 44,20) dans la région du Sud, Addis-Abeba, la région d'Amhara et la région du Tigré respectivement. Les résultats ont révélé que la prévalence de la pratique de l'épisiotomie en Éthiopie était élevée (45,01%). Par conséquent, il est préférable d'avoir une formation périodique des accoucheuses sur l'indication de l'épisiotomie et l'utilisation appropriée des directives pour réduire le taux d'épisiotomie. (*Afr J Reprod Health* 2022; 26[4]: 98-109).

Mots-clés: Épisiotomie, pratique, méta-analyse, Éthiopie, revue systématique

Introduction

An episiotomy is a surgical incision of the perineum which is done by obstetrical birth attendants to decrease the risk of severe tears followed by the enlargement of the birth canal during the expulsion of the fetus^{1,2}. It is a well-documented fact that episiotomy is the most widely used procedure in obstetrics^{3,4} even though currently routine use is not recommended⁵⁻⁶.

Globally, the rate of episiotomy ranged from 9.7% to 96.2%⁷. There is also a large variation in episiotomy practice between primiparous and multiparous women. For example, in Brazil, the rate of episiotomy was 27.4% and 4% among primiparous and multiparous women respectively⁸. At the international level, there is a trend towards reducing and limiting the use of episiotomy based on specific indications⁹. The practice of episiotomy has indicated instrumented delivery, preterm delivery, breech presentation, and suspected fetal-microsomal^{10,12}. As recommended by the World Health Organization (WHO) the rate of episiotomy in an institution does not exceed 10%¹³. This was supported by a Cochrane systematic review of episiotomy suggests that the restrictive use of episiotomy is better than routine use to reduce major infections associated with procedures¹⁴. The restrictive use of episiotomy is associated with a lower risk of posterior perineal trauma, reducing long-term complications, the need for suturing perineal trauma, and healing complications within a week¹⁵.

Several works of the literature revealed that the practice of episiotomy is associated with different health complications. The finding from studies done in different parts of the world reported that the practice of episiotomy increases the risk of third and fourth-degree perineal lacerations which had short- and long-term complications for mothers¹⁶⁻¹⁷. A study done in Taiwan showed that episiotomy increased pain, hematoma, excessive bleeding, and urinary incontinence in the first weeks of the postpartum period¹⁸. Besides, findings reported from different studies showed that sexual dysfunction¹⁹, dyspareunia²⁰, anal sphincter laceration, perineal tear, and pelvic floor morbidities are more common among nulliparous and multiparous women who underwent episiotomy²¹⁻²³. In Ethiopia, the national health institution report showed that episiotomy had

caused 9% of primary postpartum hemorrhage and 8% of maternal sepsis²⁴. Previously there was no systematic review and meta-analysis study conducted on the prevalence of episiotomy practice among women who gave birth in Ethiopia. Furthermore, the findings of episiotomy practice reported by the primary studies ranged from 30.6% to 68% across the nation²⁵⁻³³. With these variations of reports, there is no overall estimate of representative national data in Ethiopia. Therefore, this study aimed at determining the pooled prevalence of episiotomy practice among women who gave birth in Ethiopia, and that will provide the necessary information for policymakers, clinicians, and concerned stakeholders in the country to provide an appropriate strategy and intervention in the control and management of episiotomy.

Methods

Searching strategy and information sources

A detailed data search was conducted on PubMed, Web of Science, Scopus, Google Scholar, Cochrane library, and African Journals Online (AJOL) databases were used to obtain the research articles. The search strategy made in PubMed was: ((Prevalence [tw] OR Magnitude [tw] OR proportion [tw]) OR "prevalence"[MeSH Terms]) AND ((Episiotomy [tw] OR perineal incision [tw] OR perineotomy [tw]) OR "episiotomy"[MeSH Terms])) AND (practice [tw] OR perform [tw])) AND "Ethiopia"[MeSH Terms] OR "Ethiopia"[All Fields]

The research team had used systematic review per the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines 2009 for reporting findings³⁴. This systematic review and meta-analysis study was not registered under Prospero, but we checked that any author has not registered it yet.

Eligibility criteria

Those articles included in this systematic review and meta-analysis if 1. Study type: All observational studies reporting the prevalence of episiotomy practice 2. Population: Studies done among child-bearing women 3. Language: English 4. place of study: Ethiopia 5. full text was available during searching. Those articles excluded in this systematic review and meta-analysis if: 1. unrelated

research works 2. Studies with not enough data 3. Duplicate sources 4. Qualitative studies on episiotomy 5. Interventional studies; case reports 6. Articles that their full text was not available: an attempt was made to contact the corresponding author.

Study selection and data extraction

Three independent authors selected the candidate articles for the study. They exported to the reference manager software; endnote software to remove duplicate studies. They independently screened the title and abstract (NA, KA, and GA). The disagreement was resolved within a team through discussions led by a third author. Data were extracted using a standardized data extraction format prepared in Microsoft Excel by three independent authors (BW, BW, and BW). Any ideal disagreement that happened during data extraction was also solved through a discussion led by the third author. The data automation tool was not used due to the absence of the paper form (manual data) in this study. The data automation tool was not used due to the absence of the paper form (manual data) in this study. The name of the first author, study area and region, the study design, year of publication, sample size, and prevalence of episiotomy practice were collected.

Quality assessment

Two independent authors appraised the quality of the studies. The Joanna Briggs Institute (JBI) quality appraisal checklist was used³¹. When there is any disagreement all the two authors discussed and resolved it. The critical appraisal checklist has 8 parameters with yes, no, unclear, and not an applicable option. The parameter involves the following questions: (1) Where the criteria for inclusion in the sample clearly defined?, (2) Were the study subjects and the setting described in detail?, (3) Was the exposure measured validly and reliably?, (4) Were objective, standard criteria used for measurement of the condition?, (5) Were confounding factors identified?, (6) Were strategies to deal with confounding factors stated?, (7) Were the outcomes measured validly and reliably?, and (8) Was appropriate statistical analysis used?. Studies were considered low risk when they scored 50% and above of the quality assessment indicators.

Risk of bias assessment

This systematic review and meta-analysis study used a risk of bias assessment tool developed by Hoy *et al*³⁷ consisting of ten items that assess four domains of bias, internal and external validity. The first four items (items 1–4) evaluate the presence of selection bias, non-response bias and external validity. The other six items (items 5–10) assess the presence measuring the bias, analysis-related bias and internal validity. Therefore, if studies that received ‘yes’ for eight or more of the ten questions were classified as ‘low risk of bias.’ If studies that received ‘yes’ for six to seven of the ten questions were classified as ‘moderate risk’ whereas if studies that received ‘yes’ for five or fewer of the ten questions were classified as ‘high risk’.

Statistical analysis

The data were extracted using Microsoft Excel and analyzed by using STATA version 14 statistical software. Publication bias was checked by funnel plot and more objectively through Begg and Egger’s regression tests, with $P < 0.05$ considered to indicate potential publication bias. A trim and fill analysis was done to see the effect of publication bias. It adds studies to make the distribution symmetrical. The presence of significant between-study heterogeneity was assessed using Cochrane Q statistic. I^2 was used to quantify between-study heterogeneity, in which a value of 0, 25, 50, and 75% represented no, low, medium, and increased heterogeneity, respectively. A forest plot was used to visualize the presence of heterogeneity. Since a high level of heterogeneity was found, a random-effect model was used for analysis to estimate the overall prevalence of episiotomy practice. Subgroup analysis was done by region. A leave-one-out sensitivity analysis was employed to see the effect of a single study on the overall prevalence of the meta-analysis estimate. The result was presented in the form of text, tables, and figures.

Results

Selection of included studies

Database search resulted in a total of 254 research articles. Among these studies, 119 duplicate studies were removed, and 107 studies were excluded after

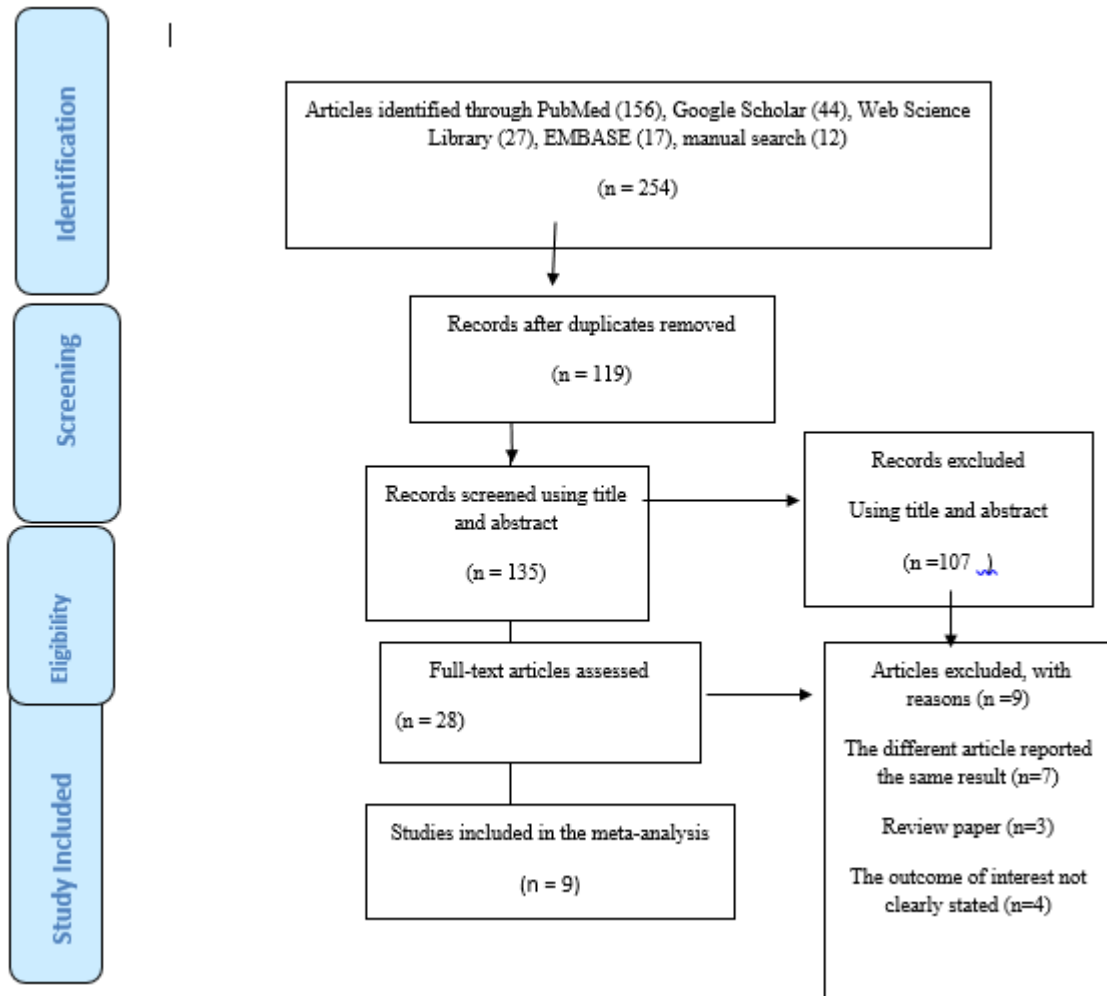


Figure 1: PRISMA diagram showing studies used for Systematic Review and Meta-analysis of the prevalence of episiotomy practice in Ethiopia

reviewing their titles and abstracts. At the eligibility evaluation phase, out of the remaining 28 studies, 19 articles were removed after the examination of their full text, and similarly by considering the inclusion and exclusion criteria. Finally, 9 studies²⁵⁻³³ with 3,228 participants were included in the analysis. All studies were cross-sectional studies and reported the prevalence of episiotomy practice (Figure 1).

Description of included studies

Among 254 articles retrieved initially, nine articles met the eligibility criteria and were included in the final meta-analysis as reported by Figure 1. The author's name, publication year, study design, sample size, region, and the percentage of episiotomy practice had listed in the below table.

Among the included studies three were conducted in Addis Ababa^{28-29,33}, two studies in Amhara^{25,30}, two studies in the South region^{26,32}, and two studies in the Tigray region^{27,31}. All studies were institutional-based cross-sectional studies. The earliest study was conducted in 2006 and the latest was conducted in 2020. The sample size ranged from 270 to 407. The prevalence of episiotomy practice ranged from 30.6 % to 68%. The sampling technique of all the selected studies was systematic random sampling methods. All selected studies were evaluated for methodological quality based on The Joanna Briggs Institute (JBI) cross-sectional quality assessment method. None of the studies were excluded based on the quality assessment criteria. All the included studies had shown a low risk. (Table 1).

Table 1: Quality assessment of the included study by using Joanna Briggs Institute (JBI) quality appraisal checklist

Item	Tefera T. et.al	Kasahun F. et.al	Yemaneh Y.et.al	Awoke A .et.al	Yonas T .et.al	Beyene F. et.al	Kiros & lakew	Kumera G. et.al	Nigusie K.et.al
Clearly defined inclusion criteria	Yes	Yes	Yes	Yes	no	Yes	No	Yes	Yes
Describing the study setting and participants	Yes	no	Yes	Yes	Yes	no	Yes	Yes	Yes
Valid and reliable exposure measurement	Yes	Yes	no	Yes	Yes	no	Yes	Yes	Yes
Objective and standard criteria for measurement	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Identified confounder	no	Yes	Yes	Yes	Yes	Yes	No	No	No
Strategies to deal with confounder	no	no	no	Yes	Yes	Yes	No	no	No
Valid and reliable outcome measurement	Yes	Yes	Yes	Yes	no	Yes	Yes	Yes	Yes
Appropriate statically analysis	Yes	no	no	Yes	no	Yes	Yes	Yes	Yes
Percentages of 'yes'	6/8=75	5/8=62.5	5/8=62.5	7/8=87.5	5/8=62.5	6/8=75	5/8=62.5	6/8=75	6/8=75

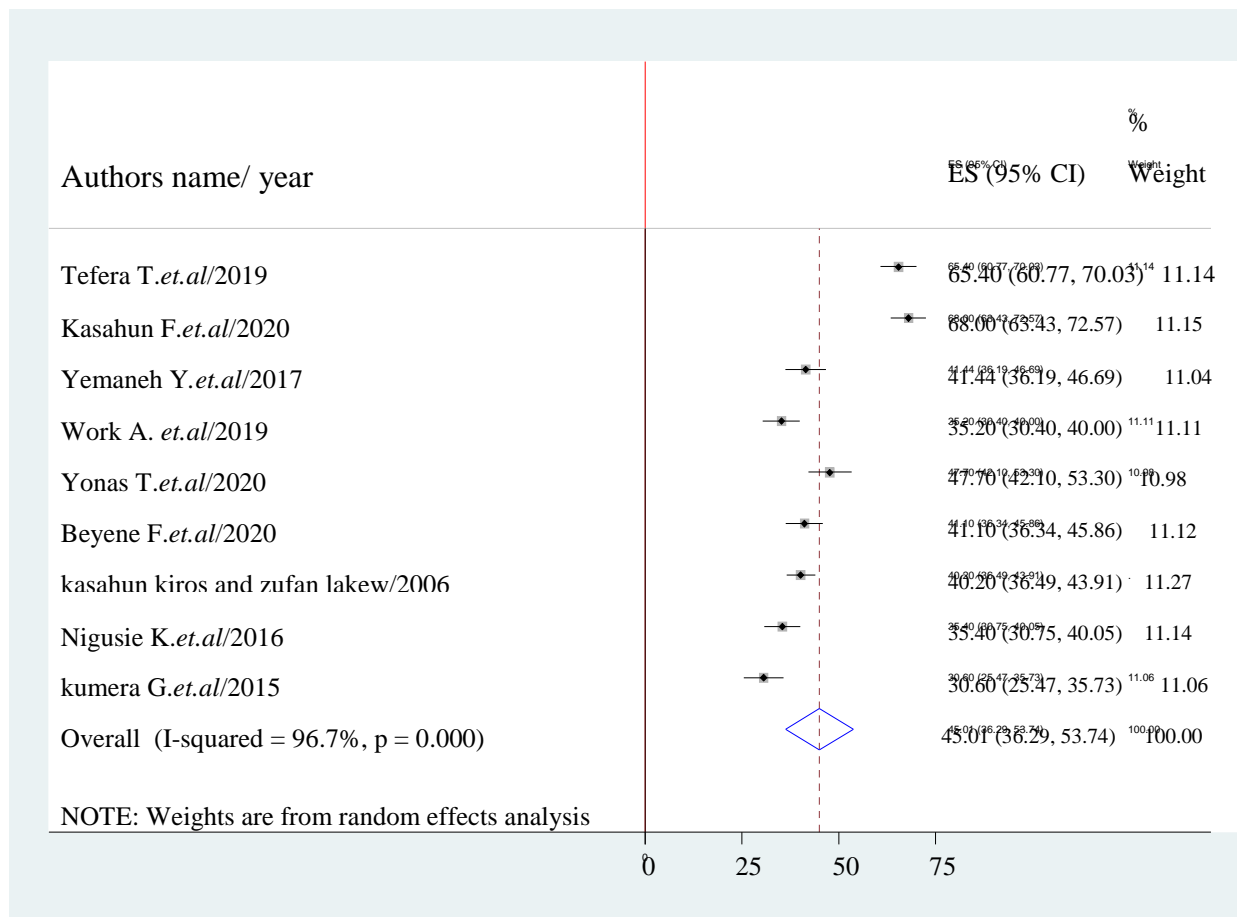


Figure 2: Forest plot of the prevalence of episiotomy practice with its 95% confidence interval

Prevalence of episiotomy in Ethiopia

The result of the I² test reported the presence of high heterogeneity (I²=96.7%, p=0.000) which showed

the need to use a random-effects model for analysis. Hence, a DerSimonian and Laird random-effects model was used to estimate the overall prevalence of episiotomy practice.

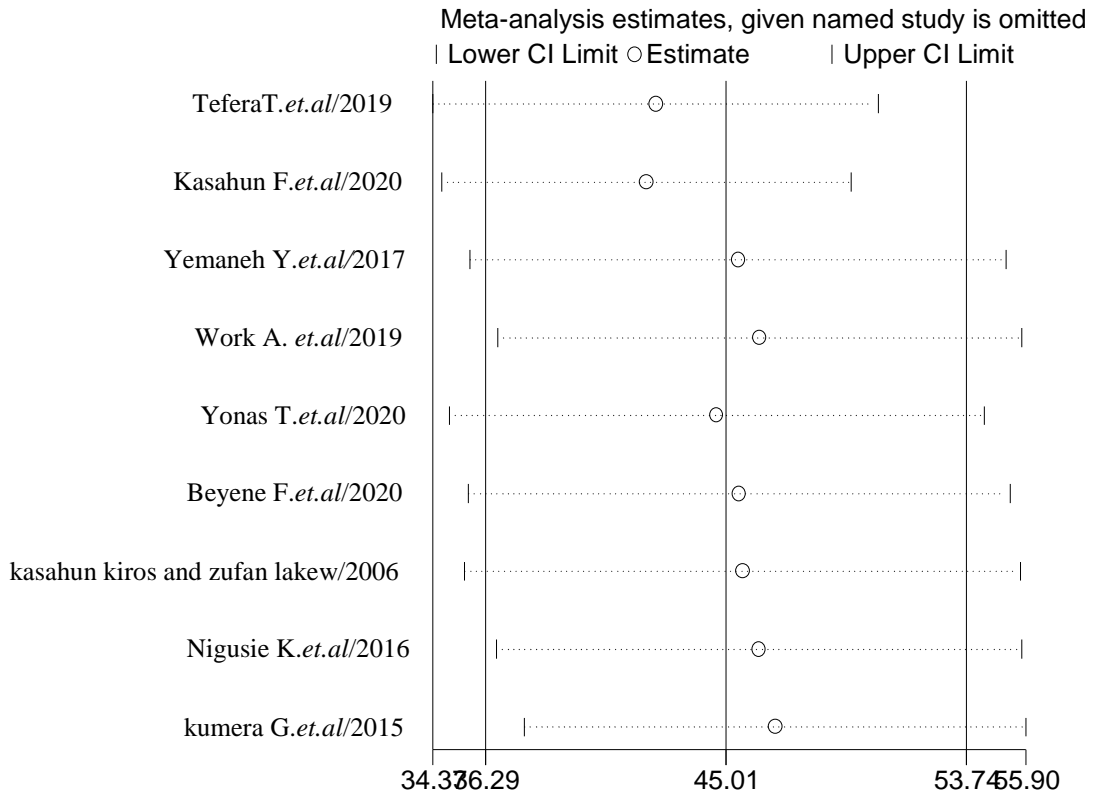


Figure 3: Sensitivity analysis to estimate the prevalence of episiotomy practice in Ethiopia

Table 2: Risk of bias assessment for the included studies used in the systematic review and meta-analysis for the prevalence of episiotomy practice in Ethiopia

Item	Tefera T. et al	Kasahun F. et al	Yemaneh Y. et al	Awoke A. et al	Yonas T. et al	Beyene F. et al	Kiros & lakew	Kumera G. et al	Nigusie K. et al
External validity									
Representativeness of the target population	Yes	Yes	Yes	Yes	No	no	Yes	Yes	Yes
Representativeness of the sampling frame	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Random sampling or censuses	yes	Yes	Yes	No	Yes	no	Yes	Yes	Yes
Minimal response bias	no	No	Yes	Yes	Yes	yes	Yes	Yes	Yes
Internal validity									
Data were collected directly	Yes	Yes	Yes	Yes	Yes	yes	Yes	No	Yes
Acceptable case definition used in the study	Yes	No	no	Yes	Yes	yes	Yes	No	Yes
Valid and reliable measurement	Yes	Yes	Yes	Yes	Yes	yes	Yes	Yes	Yes
The same mode of data collection used for all study subjects	Yes	Yes	Yes	Yes	Yes	yes	No	Yes	Yes
Appropriate length of prevalence period for parameter interest	Yes	Yes	Yes	Yes	Yes	yes	Yes	Yes	No
Appropriate numerators and denominators of interest	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
No of ' yes'	9	8	9	8	9	9	8	8	8
Summary of risk of bias	Low-risk	Low-risk	Low-risk	Low-risk	Low-risk	Low-risk	Low-risk	Low-risk	Low-risk

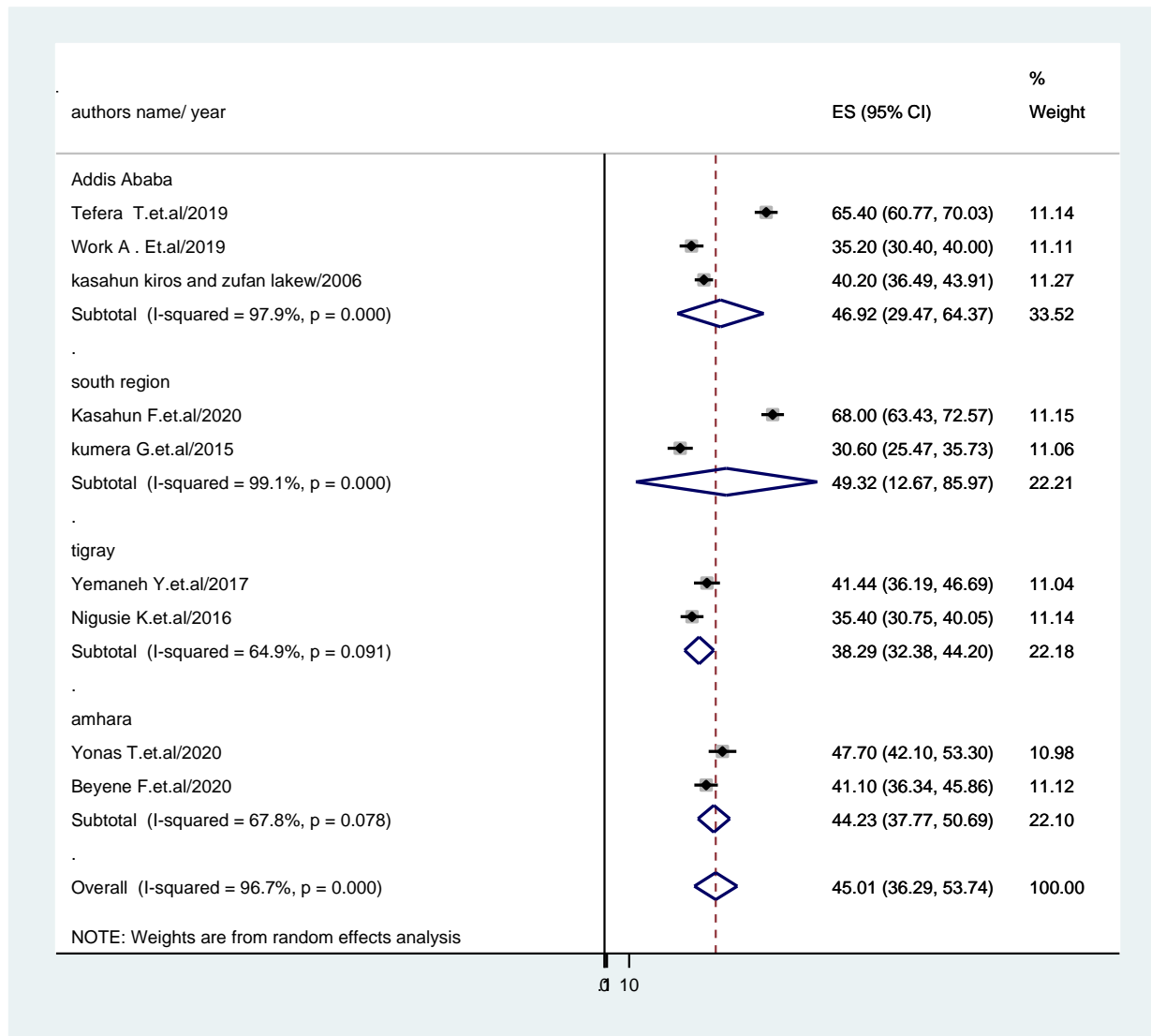


Figure 4: Forest Plot of the prevalence of episiotomy practice based on the region where the studies were conducted

Accordingly, the pooled prevalence of episiotomy practice in Ethiopia was 45% (95% CI: 36.288, 53.741) (Figure 2).

Sensitivity analysis

A leave-out-one sensitivity analysis was done to identify the effect of each study on the pooled prevalence of episiotomy practice among childbirth women by excluding each study step by step. The result reported that the excluded study brings significant change to the overall prevalence of episiotomy practice. In the sensitivity analysis, Kumera G.et.al/2015 and Kasahun F.et.al/2020 had

shown an impact on the pooled prevalence of episiotomy practice (Figure 3).

Sub-group analysis

The subgroup analysis based on the region revealed that the prevalence of episiotomy practice among women who gave was found to be 49.32% in the South region, 46.92% in Addis Ababa, Tigray 38.29%, and 44.23 % in the Amhara region (Figure 4). The sub-group analysis based on the year of publication showed that the prevalence of episiotomy practice was found to be 35.57% in the year before 2016, and 47.76% in the year 2016-2021 (Figure 5)

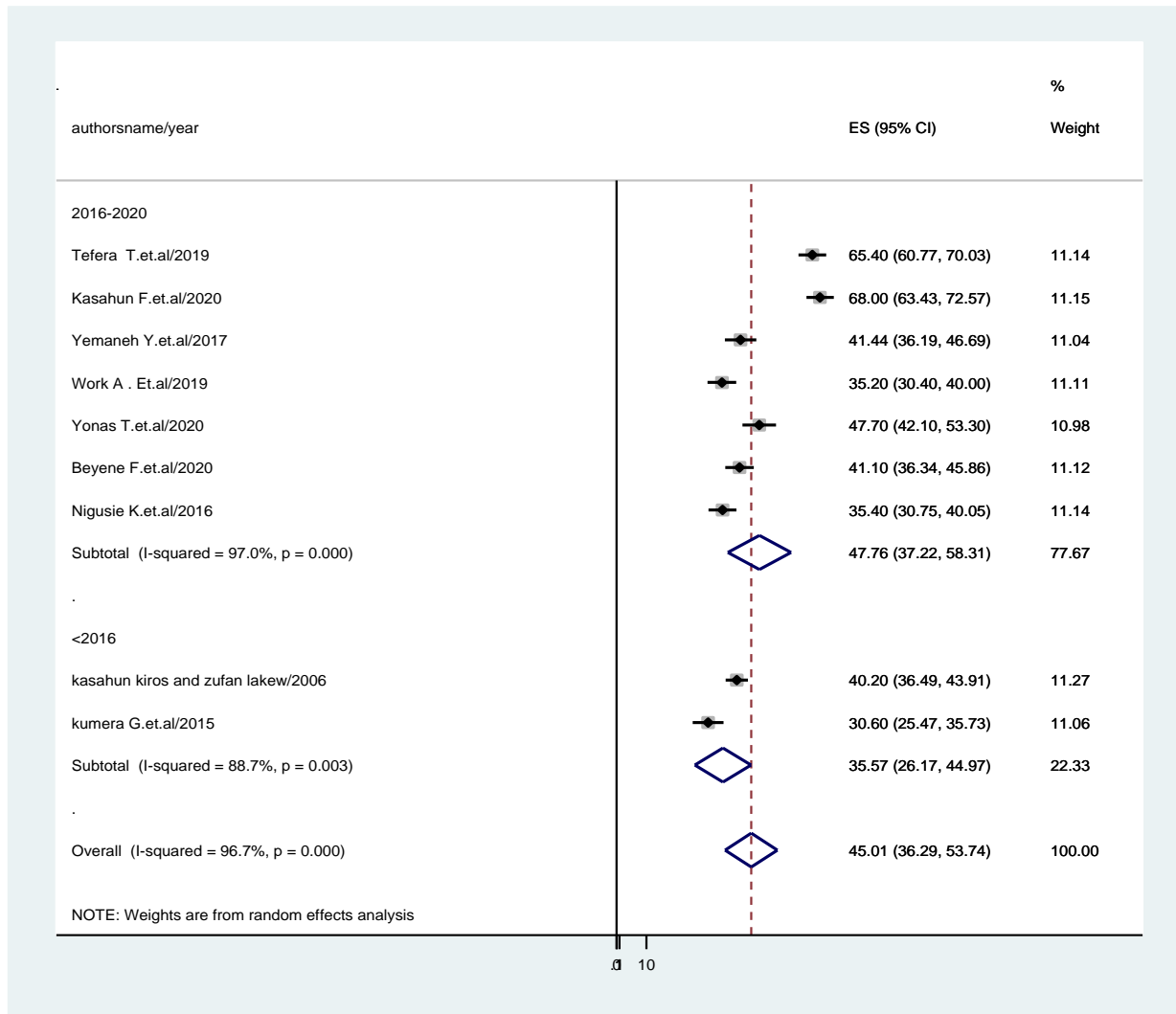


Figure 5: Forest Plot of the prevalence of episiotomy practice based on the year of the included articles published

Table 3: Descriptions of the studies used in the systematic review and meta-analysis for the prevalence of episiotomy practice in Ethiopia

Author/year	Setting	Region	Study design	Sample size	prevalence	Study quality
Tefera T.et.al/2019	Saint-Paul Hospital	Addis Ababa	Cross-sectional	405	65.4	Low risk
Kasahun F.et.al/2020	Arba Minch Hospital	South	Cross-sectional	400	68	Low risk
Yemaneh Y.et.al/2017	Axum Public health institutions	Tigray	Cross-sectional	338	41.44	Low risk
Awoke A.et.al/2019	Akaki Kaliti public health institutions	Addis Ababa	Cross-sectional	381	35.2	Low risk
Yonas T.et.al/2020	Gondar Hospital	Amhara	Cross-sectional	306	47.7	Low risk
Beyene F.et.al/2020	Bahirdar Hospital	Amhara	Cross-sectional	411	41.1	Low risk
Kasahun Kiros & Zufan lakew /2006	Tikur-Ambesa Hospital	Addis Ababa	Cross-sectional	270	40.2	Low risk
Nigusie K.et.al/2016	Shire town public health institutions	Tigray	Cross-sectional	407	35.4	Low risk
Kumera G.et.al/2015	Mizan Aman General Hospital	South	Cross-sectional	310	30.6	Low risk

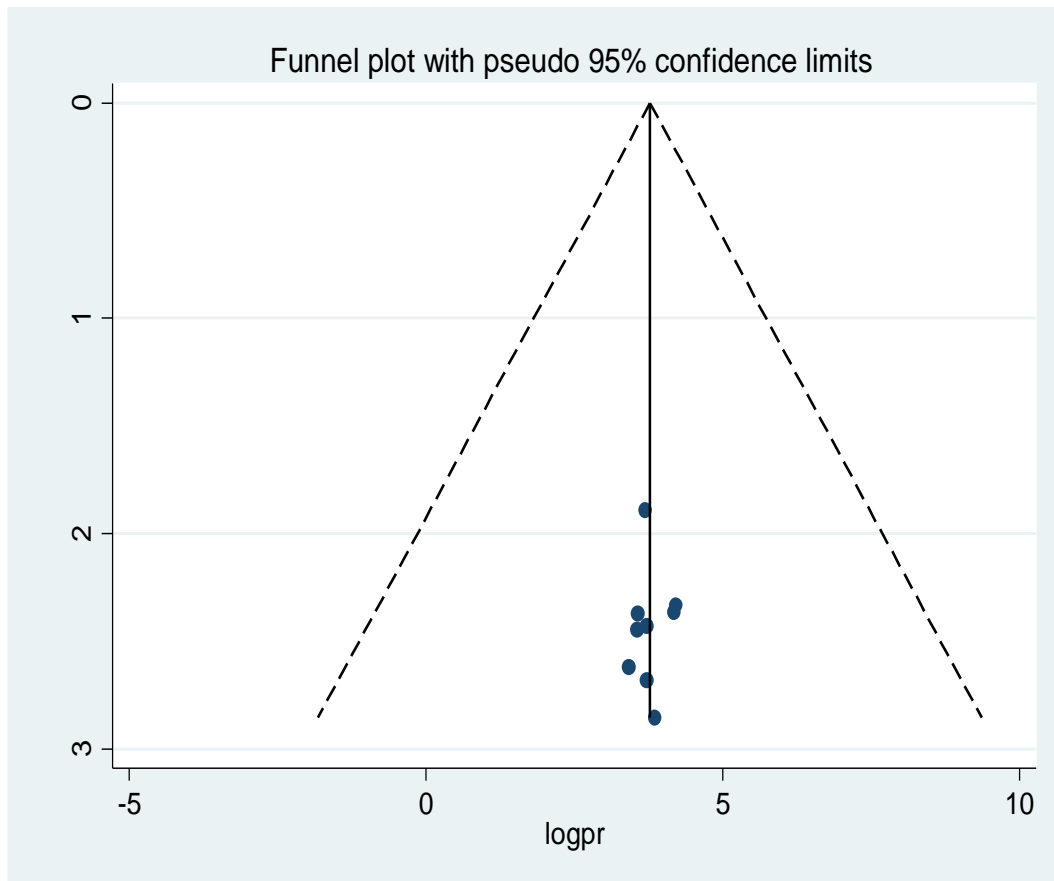


Figure 6: Funnel plots for publication bias of episiotomy practice

Publication bias

The presence of publication bias was checked by using a funnel plot, Eggers and Beggs test with a significant level of $p\text{-value} = 0.05$. Then, the Beggs and Eggers tests were not statically significant with a $p\text{-value} = 0.896$ and $p\text{-value} = 0.754$ respectively. There was no publication bias for a funnel plot that showed symmetrical distribution (Figure 6).

Discussion

Episiotomy is one of the most common procedures in obstetrics which is performed by surgical incision of perineum either medially or mediolateral during the second stage of labor to increase the diameter of the vaginal outlet to facilitate the parturition of the baby. As the World health organization's set a trend towards reducing the rate of episiotomy practice less than 10% contributes to reducing the maternal morbidity and

mortality caused by hemorrhage and sepsis associated with the procedures.

This study reviewed the prevalence of episiotomy practice among women who gave birth. Hence, nine studies were included in the analysis which was based on the fulfillment of eligibility criteria. To the best of the researcher's knowledge, this systematic review and meta-analysis give an overall estimation of the prevalence of episiotomy practice among women who gave birth in Ethiopia.

In this study, we estimated the pooled prevalence of episiotomy practice among women who gave birth by taking 9 observational studies done in the nation irrespective of both parity and type of episiotomy (selective or routine, Medial or Medio-lateral). Therefore, in this systematic review and meta-analysis, the pooled prevalence of episiotomy was found to be 45.01%. This recommends that there is a high rate of episiotomy practice among women who gave birth, which indicates poor control of obstetric procedures

related to their indications. An intensive approach is required to reduce the rate of episiotomy which focuses on the health providers' training and health education regarding procedural indications.

This finding is consistent with a finding of a systematic review and meta-analysis conducted on lower and middle-income countries which reported that the prevalence of episiotomy practice was 46%³⁵. On the other hand, this finding is higher than the prevalence of systematic review and meta-analysis was done in Cameroon (10%) in contrast with the prevalence in Pakistan (98%)³⁵. The possible explanation of this variation was the presence of differences in culture, socio-economic status, and health policy implementation across the countries.

The finding of the study is lower than the result of the systematic review and meta-analysis conducted on episiotomy in vacuum-assisted delivery affects the risk of obstetric anal sphincter injury which showed that the prevalence of episiotomy was 63.3%³⁶. The discrepancy was due to the presence of the variation of the sample population, unlike the current study, this was conducted on women who gave birth through a vacuum which is one of the indications to use episiotomy

A regional estimate of episiotomy practice in the subgroup analysis showed that a lower prevalence was Tigray and higher was in Addis Ababa. The possible reason behind this variation could be due to media accessibility for health service information and the presence of earlier introduction of the episiotomy in Addis Ababa (Black Lion Hospital) which highly influences episiotomy practice.

The prevalence of estimated episiotomy practice by study period in the sub-group analysis showed that the prevalence of episiotomy practice was 35.57% in the studies published before 2016, and 47.76% in studies published from 2016 to 2020. Studies published before 2016 had a lower episiotomy practice as compared to those published after 2016. This could be due to the number of studies included in the category, paper quality, study period as well as the insufficient awareness of episiotomy practice to clients claim for this change.

In this study, we used a random-effect model to manage a significant variation that resulted in between-study heterogeneity. We assessed leave one-out-one sensitivity analysis,

and the result showed that every single study had a significant impact on the pooled episiotomy practice. We also tried to assess the possible source variability by sub-group analysis using study region and period. The high heterogeneity might be due to differences in the sample population between studies, paper quality, socio-cultural, ethnic, and regional difference claims this variation.

Conclusion

In conclusion, this study revealed that the prevalence of episiotomy practice was relatively high in Ethiopia. Besides, the prevalence of episiotomy practice differed by both region study periods. Therefore, it is better to have periodic training for birth attendants about the indication of episiotomy and the appropriate use of guidelines to reduce the rate of episiotomy.

Strength and limitations of the study

- ✓ This study used an extensive comprehensive searching strategy of both published and unpublished Studies through the different datasets
- ✓ The quality of each included paper was assessed by using JBI.
- ✓ It might lack national representativeness since no information was found from Oromia, Somalia, Afar, Gambella, and Benishangul-Gumuz regions

Authors' contributions

NA conceived and designed the study. NA and KA established the search strategy. NA, BW, and BW did the statistical analysis of this research. NA, KA, GA, BW, BW, and EA wrote the review. All the authors read the manuscript before they have given the final approval for publication.

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Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declared that they have no competing interests.

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