



Factors Associated with Episiotomy Practices in Bahirdar City, Ethiopia: A Cross-Sectional Study

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Background: Episiotomy is the surgical enlargement of the vaginal orifice during the last part of the second stage of labor or childbirth by an incision to the perineum. The World Health Organization advises the use of episiotomy on a restricted and selective basis. Indeed, the rate of episiotomy in developed countries is decreasing, but in developing countries, including Ethiopia, it still remains high. Therefore, this study tried to assess the proportion and factors associated with episiotomy among women who gave birth at Felege Hiwot Referral Hospital, Bahir Dar City, North West Ethiopia, 2017.

Methods: An institution-based cross-sectional study was conducted among 411 mothers from February to April 2017. Data were collected through face-to-face interviews and supported by observation using standard checklist with systematic random sampling technique. Data was entered by Epi Info and analyzed by SPSS version 23. The association between variables was analyzed using bivariable and multivariable logistic regression model. P-value <0.05 at 95% CI was considered to be statistically significant.

Results: The proportion of episiotomy was 41.1% with 95% CI (36.5%, 46.2%). Multivariable logistic regression showed that primiparity (AOR=6.026, 95% CI (3.542,10.253)), prolonged second stage of labor (AOR=4.612, 95% CI (2.247,9.465)), instrument delivery (AOR =3.933, 95% CI (1.526,10.141)), using oxytocin (AOR=2.608, 95% CI (1.431,4.751)), medical resident attendant (AOR =3.225, 95% CI (1.409,7.382)) and birth weight ≥ 4000 grams (AOR=5.127,95% CI (1.106,23.772)) were significantly associated with episiotomy practice.

Conclusion: The proportion of episiotomy was high. Parity, using oxytocin, second-stage labor duration, instrument delivery, birth weight, and delivery attendant were statistically significant factors for episiotomy practice. Therefore, as per our findings, we suggest awareness creation, and the setting and use of new national guidelines, the practice of routine episiotomy should be abandoned, and selective and restrictive use of episiotomy is highly advised.

Keywords: episiotomy, women, Bahir Dar, Ethiopia

Background

Episiotomy is the surgical enlargement of the vaginal orifice during the last part of the second stage of labor or childbirth by an incision to the perineum.^{1,2} Only two major types of episiotomy (median and mediolateral) are usually described in standard obstetric and midwifery texts.^{1,3-5} Midline episiotomies are common in the USA, where mediolateral episiotomy is most commonly performed, as in Europe.⁶ The procedure was suggested prior to assisted vacuum- or forceps delivery, shoulder dystocia, breech delivery, macrosomic fetuses, and persistent occiput posterior positions in the case of abnormal labor progression, and non-reassuring

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fetal heartrate pattern.^{7–10} It also stated episiotomy as a risk factor of spontaneous perineal tear, subsequent pelvic floor dysfunction, urinary and fecal incontinence, sexual dysfunction, and fetal head injury, medical resident and individual professional judgment was decreased in order to accelerate the second stage of labor.^{11,12,24,32} In the 1920s a number of reviews were started and then routine episiotomy was advocated.¹³ However, when the first clear clinical studies were released, the long-held assumptions that postoperative pain is less and that recovery improved with an episiotomy compared to a tear seemed to be wrong.^{10,14} Some studies have shown a protective impact on injuries to the obstetric anal sphincter,¹⁵ although others indicate that assuming that regular episiotomy decreases perineal/vaginal trauma is not warranted by current evidence, but it has undue adverse effects such as extreme perineal trauma, pelvic floor dysfunction, or prolapse of the pelvic organ compared to restrictive episiotomy usage.^{10,16,17} In addition, episiotomy has been associated with an increased risk of anal postpartum incontinence, dyspareunia, increased discomfort, severe bleeding, wound hematoma, and infection, implying minimal practice.^{17,18} Therefore, indications for routine episiotomy are not well supported, restrictive use of episiotomy is advocated.^{19,20} The Royal College of Obstetricians and Gynecologists (RCOG) sets a conservative episiotomy policy guideline that is: <30% in general, < 50% for primiparous, <10% for multiparas.² The lack of evidence on the efficacy of episiotomy in general is also expressed by WHO 2018 and suggests restrictive episiotomy use, although no particular rate is suggested.²² The population-based analysis in France reveals that overall, the national episiotomy rate for vaginal deliveries decreased considerably from 26.7% in 2007 to 19.9% in 2014.²³ The total episiotomy incidence decreased from 20.3% in 2002 to 9.4% in 2011 in the United States.²⁴ In one European study, episiotomy rates ranged from 3.7% in Denmark to 75% in Cyprus.²⁵ In some African studies, it ranges from 63.3% (South Africa) to 100% (Guatemala) for nulliparous women and other evidence in Rwanda has been reported for nulliparous 80.1% and 19.9% for multiparous women.^{26–28} The episiotomy performance in Ethiopia specifically, is high.^{29–33} The rate of episiotomy in developed countries is on the decline, but in developing countries it remains high. While episiotomy practice has become a common issue among mothers who have delivered vaginally in Ethiopia, studies are limited to show the extent of the problem. Therefore, this study aimed to assess the proportion and factors

associated with, episiotomy among mothers who vaginally delivered in Bahir Dar City Felege Hiwot Referral Hospital, North West Ethiopia.

Methods

Study Design, Period and Area

Institutional-based cross-sectional study was conducted from February to April 2017 at Felege Hiwot Referral Hospital, Bahir Dar City, Ethiopia. Bahir Dar City is the capital city of the Amhara National Regional State, located at about 565 km north west of Addis Ababa (the capital city of Ethiopia). Felege Hiwot Referral Hospital is a tertiary referral hospital. It provides service for an estimated 7 million people from the surrounding area, and has a separate on-site maternity facility which serves around 6000 deliveries per year.

Population

All women who gave birth vaginally after gestational age of viability (≥ 28 weeks in Ethiopia context) during the study period were included as study population.

Sample Size Determination and Sampling Technique

Sample size was determined using single population proportion formula with the following assumptions; the proportion of women who had episiotomy was 42%,³⁸ marginal error 5%, value for 95% CI (1.96), and non-response rate of 10%, the the final sample size was 411.

The study participant was selected by systematic sampling technique every two intervals. The first study participant was selected by lottery method; then the next study participant was identified systematically in every other interval until the required sample size was achieved.

Data Collection Procedure

A standardized questionnaire containing socio-demographic characteristics, obstetric variables and other variables related to the risk of exposure to the outcome, in English was prepared in accordance with the research objectives and the local situation of the study area. The questionnaire was then translated to Amharic and back to English to ensure the instrument's accuracy. A total of three data collectors (Bachelor of Science in Midwifery) who were working outside the study area and one supervisor (Master of Science in Clinical Midwifery), were recruited. Then one day of training was given on collection

of data by chart review supported with face-to-face interview and with observation with standard check list to control under-registration of clinical data.

Data Quality Assurance

After an exhaustive analysis of applicable literature, the data collection method was prepared. The questionnaire pre-test was conducted on 5% of respondents at a referral hospital with equivalent settings, and changes were made accordingly. Any mistake, uncertainty or incompleteness found was immediately corrected. For one day, data collectors and supervisors were trained on the contents of the questionnaire, the intent of the analysis, the method of collecting data, confidentiality, the right of respondents and informed consent (including how to take informed consent from participants aged less than 18 years). During data collection and also immediately after data collection by the supervisor and principal investigator, the completeness of the data was reviewed by data collectors.

Data Processing, Analysis, and Interpretation

During the data collection process, supervisor and principal investigator reviewed the data for its completeness and accuracy. The collected data were cleaned, coded and entered using Epi Info version 3.7 and then exported for review to SPSS version 23. To summarize the results, descriptive analysis was performed. Analysis of binary logistic regression was conducted to see the relationship between the independent and outcome variable. In the multivariable logistic regression analysis, all explanatory variables with $p < 0.2$ were entered and relevant associations were established based on $p < 0.05$ and modified odd ratio (AOR) with 95% CI. Using the Hosmer–Lemeshow goodness of fit test, the final model was mounted. The study's final outcome was presented in the form of texts and tables.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the institutional review board of Bahir Dar University. A formal letter request of cooperation was written to Bahir Dar city health office. Written consent was obtained from each study participant and also assent was obtained from their guardian for those aged less than 18 years old. Confidentiality of information and privacy was maintained.

Result

Socio-Demographic Characteristics

A total of 411 women who vaginally gave birth were enrolled in the study with 100% response rate. The majority of participants, (369 (89.8%)) were in the age group 20–34 years with a mean age of 26.26 ± 4.66 years. The majority of participants, (264 (64.2%)) were in urban residency. Of the respondents, about 191 (46.5%) were secondary and above educational levels (Table 1).

Obstetric Characteristics

From the total (411) of study participants 169 (41.1%) (CI95% 36.5–46.2%) of them had episiotomy. Three fourths (310 (75.4%)) of participants were delivery at term gestational age, and 154 (37.5%) of participants were primiparous. One hundred-seventy (41.4%) of them were admitted in latent stage of labor, and for 291 (70.8%) of the mothers labor was accomplished spontaneously. Ninety-nine (24.1%) of them stayed for more than 2 hours during second stage of labor at the delivery coach. Regarding mode of delivery, 357 (86.9%) of them delivered spontaneously followed by 45 (10.9%) of the mothers by instrument- assisted delivery. The majority 394 (95.9%) of them presented with vertex presentation and 340 (82.7%) of them in occipito anterior position (Table 2).

Table 1 Socio-Demographic Characteristics of the Participants at Felege Hiwot Referral Hospital, Bahir Dar, Ethiopia, February 2–April 30, 2017 (n=411)

Variables	Frequency	Percent
Age (years)		
15–19	12	2.9
20–34	369	89.8
≥35	30	7.3
Residence		
Urban	264	64.2
Rural	147	35.8
Educational level		
No formal education	143	34.8
Primary level	77	18.7
Secondary level and above	191	46.5
Occupation		
House wife	239	58.2
Government employee	67	16.3
Merchant	87	21.2
Farmer	18	4.4

Table 2 Distribution of Participants by Obstetric Characteristics at Felege Hiwot Referral Hospital, Bahir Dar, Ethiopia, February 2–April 30, 2017 (n=411)

Variables	Frequency	Percent
Gestational age (weeks)		
<37	87	21.2
37–41+6	310	75.4
≥42	14	3.4
Parity		
Primipara	154	37.5
Multipara	257	62.5
Previous history of mode of delivery		
Spontaneous vaginal delivery	156	57.2
Episiotomy assisted	82	34.7
By caesarean section	19	8.1
Ante natal care follow up		
Yes	391	95.1
No	20	4.9
Labor status during admission		
Latent stage of labor	170	41.4
Active stage of labor	159	38.7
Second stage of labor	43	10.5
No labor	39	9.5
Oxytocin used		
No	291	70.8
Yes	120	29.2
Duration of 2nd stage of labor		
≤1hr	169	41.1
1.1–2hr	143	34.8
>2hr	99	24.1
Number of neonate		
Single	397	96.6
Twin	14	3.4
Presentation		
Cephalic	394	95.9
Breech	17	4.1
Mode of delivery		
Spontaneous vaginal delivery	357	86.9
Instrument-assisted delivery	45	10.9
Assisted breech delivery	9	2.2
Pregnancy condition during labor		
Normal gestation	349	84.9
Gestational hypertension	38	9.2
Diabetes	8	1.9
Others*	16	3.9
Episiotomy		
Yes	169	41.1
No	242	58.9

(Continued)

Table 2 (Continued).

Variables	Frequency	Percent
Delivery attendant		
Midwives	236	57.4
Medical residents	96	23.4
Intern medical student	79	19.2
Birth weight		
2500–3999gm	357	86.9
≤ 2499gm	33	8
≥ 4000gm	21	5.1
Sex of newborn		
Male	206	50.1
Female	205	49.9

Notes: *HIV ADS, Anemia, Asthma, Goiter and Chorioamnionitis.

Simple and Multivariable Logistic Regression Analysis of Factors Associated with Episiotomy

Among mothers who had episiotomy 99 (64.3%) of them were primiparous whereas 70 (27.2%) of them were multiparous. In bivariate analysis variables associated with episiotomy were, residence, education, occupation, gestational age, parity, labor pattern, duration of second stage of labor, mode of delivery, delivery attendant and birth weight. But, after adjusting for possible confounder by multivariable analysis, factors that remained significantly associated with a greater risk of episiotomy were: primiparous (AOR=6.03; 95% CI (3.54,10.25); $P<0.001$), using oxytocin drug (AOR=2.61; 95% CI (1.43,4.75); $P=0.002$), a -prolonged second stage of labor (AOR=4.61;95% CI (2.25,9.47); $P<0.001$), delivery attended by medical residents (AOR=3.23; 95% CI (1.41,7.38); $P=0.006$), instrument delivery (AOR=3.93; 95% CI (1.53, 10.14); $P=0.037$) and birth weight ≥ 4000 gm (AOR=5.13;95% CI (1.11,23.77); $P=0.001$), as statistically significant (Table 3).

Discussion

This study identified that the proportion of episiotomy among laboring mothers who gave birth vaginally was 41.1% with 95% CI (36.5–46.2). The proportion episiotomy among nulliparous women was 64.3% whereas among multiparous 27.2% women underwent episiotomy at the time of their vaginal delivery. This result is not in line with international guidelines and recommendations, such as those recommended by the Royal College of Obstetricians (RCOG) that recommends <30% in general,

Table 3 Logistic Regression Analysis of Factors Associated with Episiotomy at Felege Hiwot Referral Hospital, Bahir Dar, Ethiopia, February 2-April 30, 2017 (n=411)

Variable	Episiotomy		COR (95% CI)	AOR (95% CI)	p-value
	Yes (%)	No (%)			
Residence					
Urban	128(48.5)	136(51.5)			
Rural	41(27.9)	106(72.1)	0.41(0.26,0.63)	0.66(0.27,1.60)	0.360
Educational level					
No formal education	30(21)	113(79)	0.24(0.15,0.40)	0.56(0.28,1.15)	0.117
Primary level	40(52)	37(48)	1.00(0.59,1.70)	1.87(0.83,4.21)	0.126
Secondary level and above	99(51.8)	92(48.2)			
Occupation					
Government employee	43(69.4)	24(30.6)			
House wife	85(35.6)	154(64.4)	0.30(0.17,0.54)	0.79(0.29,2.16)	0.653
Merchant	30(34.5)	57(65.5)	0.29(0.15,0.57)	0.45(0.17,1.19)	0.110
Farmer	11(61.1)	7(38.9)	0.87(0.30,2.56)	0.27(0.05,1.42)	0.125
Gestational age (weeks)					
<37	18(20.7)	69(79.3)			
≥37	151(46.6)	173(53.4)	0.29(1.90,5.87)	1.21(0.548,2.812)	0.604
Parity					
Primipara	99(64.3)	55(35.7)	4.80(3.13,7.38)	6.02(3.54,10.25)	<0.001
Multipara	70(27.2)	187(72.8)			
Labor					
Spontaneous	87(29.9)	204(70.1)			
Oxytocin used	82(68.3)	383(31.7)	5.06(3.19,8.00)	2.60(1.43,4.75)	0.002
Duration of 2nd stage of labor					
≤1hr	43(25.4)	126(74.6)			
1.1–2hr	53(37.1)	90(62.9)	1.72(1.06,2.80)	1.647(0.92,2.94)	0.091
>2hr	73(73.7)	26(26.3)	8.22(4.67,14.48)	4.61(2.24,9.46)	<0.001
Mode of delivery					
Spontaneous delivery	131(36.7)	226(63.3)			
Instrument-assisted delivery	35(77.8)	10(22.2)	6.03 (2.89,12.59)	3.93(1.52,10.14)	0.005
Assisted breech delivery	3(33.3)	6(66.7)	0.86(0.21,3.50)	2.12(0.40,11.19)	0.373
Delivery attendant					
Midwife	78(33.1)	158(66.9)	1.06(0.61,1.84)	1.22(0.62,2.40)	0.563
Resident	66(68.8)	30(31.2)	4.75 (2.50, 9.02)	3.22(1.40,7.38)	0.006
Intern medical student	25(31.6)	54(68.4)			
Birth weight (grams)					
≤2499	6(18.2)	27(81.8)			
2500–3999	152(42.6)	205(57.4)	3.33(1.34,8.28)	2.5(0.81,7.77)	0.110
≥4000	11(52.4)	10(47.6)	4.95(1.44,16.95)	5.12(1.10,23.77)	0.037

Notes: AOR and P-values written in bold font show statistically significant variables.

<50% for primiparous, and <10% for multiparas;²¹ or American College of Obstetrics and Gynecology (ACOG2016)¹⁹ and WHO recommendations which suggest restrictive use of episiotomy, although no specific rate is recommended.²² It was higher than previous studies

done in Brazil (29.1%)³⁴ and Vietnam (29.9%).³⁵ This disparity may be due to the difference in the design of the study and the time gap; as the previous studies were retrospective cross-sectional studies, some under-registration may result and could lead to a lower level of

episiotomy procedure. In addition to this, the number of trained health professionals available with technology development and the use of a standard guideline related to episiotomy indications and a deliberate effort to minimize the use of episiotomy in the study center may vary in that setup. On the contrary, it was lower than a study done in Latin America (50%).³⁶ This discrepancy may be due to the difference in the research duration; in Latin America, the data collection period was almost a year and that may demonstrate the actual prevalence of episiotomy by monitoring the seasonal variation of patient flow or the various institutional rules and individual clinical practice may be the different. In addition, the discrepancies may be explained by inappropriate reporting, meaning that the tear may be reported as an episiotomy by the health provider after fixing it, which may also be attributable to the time gap in the understanding of health professionals regarding regular episiotomy use. Whereas the finding is in line with the study done in Burkinafaso (37%)³⁷ and in Nigeria (45%).¹¹ The possible explanation for this consistency might be similar distribution of qualified personnel in adherence to the recommendation of selective use of episiotomy.

When comparing this result with Ethiopia studies, it coincides with study found in Tikur Anbessa Hospital Addis Ababa (40.2%)³⁷ and in Markos (42%).³⁸ The possible explanation of consistency might be due to similar patient flow and similar practice level, serving as referral and teaching hospital level. However; it is slightly higher than the result in Shire town (35%),²⁹ and Mizan Aman 30.6%³⁰ which might be due to the site being a training hospital where trainee doctors would tend to perform more episiotomies to practice, or variations in data registrations quality. And also it is higher than study done in Jima (25%)³¹ which might be because data collection was not only by document review but also supported with interview which prevents under-registration of clinical data. Moreover, this might be because of the new strategy of the ministry of health of Ethiopia, increasing distribution of ambulances and the increased awareness creation ability of health extension workers in rural areas which decreases the number of women who deliver at home by bringing them to the hospitals.

The analysis of this study showed that primiparous women had a 6-fold greater likelihood of having episiotomy compared to multiparous women. This is in agreement with findings reported in some parts of the world; Latin America,³⁶ Brazil,³² Vietnam,³⁵ Saudi Arabia,²⁶

Iran³³ and some parts of Ethiopia; Addis Ababa Tikur Anbessa Hospital,³⁷ Jima Teaching Hospital,³¹ Mizan Aman General Hospital,³⁰ Debre-Markos Referral Hospital,³⁸ and Shire Town.²⁹ The potential explanation may be that the perineum of primiparous parturient provides a tensor musculature than multiparous women, which may lead to increased release duration of cephalic pole, causing episiotomy to be performed by the delivery attendant. Other explanations may be attributable to the fact that care providers are helpful for first births to protect the perineum, taking into account the old guidelines of regular episiotomy results. In addition, the difference may be due to the case load and care providers may not have patience to remain with primiparous mothers for a longer time, because they have a comparatively longer labour period than multiparous mothers. Episiotomy performance in the first birth is a risk factor for the occurrence of spontaneous lacerations in subsequent births. Nevertheless, these data may reflect a more liberal practice of episiotomy in primiparous rather than any real need for the procedure in this group of women.

The statistical analysis of this study implies that: start of labor assisted by oxytocin were 5 times more likely to perform episiotomy than labor allowed to evolve normally. Our results concur with findings in Latin America,³⁶ Brazil,³² Vietnam,³⁵ Iran,³³ and in Shire town Ethiopia.²⁹

The potential reason may be if labor does not start and progress naturally that does not bring perineal muscle physiological relaxation and then could increase labor period, it could also be due to intentional use in an effort to reduce labor time and could imply a more interventionist approach by the delivery attending professional. Induced deliveries can also be more dystocic and can cause a cascade of other interventions that may result in fetal heart rate patterns of non-reassurance that require an episiotomy to be performed by the caregiver.

The statistical analysis of the relationship between episiotomy and instrument-assisted deliveries shows that the use of instruments, especially forceps, has involved 3.9-fold probability of performing episiotomy. This statistic coincides with the findings in Latin America,³⁶ Brazil,³² Iran,³³ Saudi Arabia³⁴ and some parts of Ethiopia; Addis Ababa Tikur Anbessa Hospital,³⁷ Jima Teaching Hospital³¹ and Debre-Markos Referral Hospital.³⁸ This relationship may arise from the referral of complex laboring mothers flow to the center for advancing care with greater technological and human resources. Professionals may therefore assume that instrumental

delivery is an indication of episiotomy to reduce perineal tears, especially when using forceps. However, there is no clear indication for episiotomy when an instrumental delivery is performed; it is believed to result in an increase in severe lacerations of the perineum, with possible damage to anal function. But the role of routine episiotomy in instrumented birth is not well studied and requires more research¹⁸ Some authors have suggested that episiotomy may not be absolutely necessary in childbirth.³⁹

In this study prolonged second stage of labor over 2 hours was 4.6 times higher risk of episiotomy. This finding was also supported by studies; in Iran³³ and in Ethiopia; Addis Ababa Tikur Anbessa Hospital 37 and Debre-Markos Referral Hospital.³⁸ The potential explanation might be due to the incidence of maternal fatigue that may be as a result of mothers being asked to push down from the early second stage for a long period of time or there could be insufficient provision of any labor support contributing to mothers not pushing after more than 2 hours of efforts and thus prolonging the second stage of labor. So, obstetric care providers were also designed to perform an episiotomy to minimize trauma, fetal distress, and perinatal asphyxia reduction.

The statistical analysis of this result showed that deliveries attended by medical residents were 3 times more likely to have episiotomy than those attended by midwives. This individual professional judgment risk was supported by studies done in Spain²⁴ and Brazil.³² This may mean that the practice in this center is that residents were often invited only to attend when an established risk factor warranted their attention, or that most of the complex deliveries in this center were performed by senior health professionals in which episiotomy is highly required.

This result reveals that fetal weight ≥ 4000 gm was 5 times more likely risk of episiotomy which coincides with the findings reported from other centers; in Spain²⁴ and some parts of Ethiopia; in Mizan Aman General Hospital³⁰ and in Debre Markos Referral Hospital.³⁸ This might be due to fear of perineal laceration, to boost adequate space for higher fetal weight and might be associated with instrument-assisted birth.

Limitation of the Study

The limitations of this study include the cross-sectional nature of the study, it is not able to assess some variables related to post-operative outcome.

Since the data collector is a health professional, there might be social desirability bias.

Conclusion and Recommendations

In this study the proportion of episiotomy was high. Primiparity, prolonged duration of second stage of labor, using oxytocin drug, instrument-assisted delivery, delivery attended by medical residents and birth weight ≥ 4000 grams were significantly associated with episiotomy practice. As per our findings we suggest emphasis on the restrictive use of episiotomy and with clear indication to reduce its rates and unnecessary procedures. And deal with national policy makers in both governmental and non-governmental sectors .

Abbreviations

ANC, ante natal care; APGAR, Appearance, Pulse, Grimace, Activity, Respiration; WHO, World Health Organization.

Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author upon request.

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Author Contributions

All authors made substantial contributions to conception, study design, execution, and acquisition of data, analysis and interpretation; drafting, revising or critically reviewing the article; journal selection for publication, gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare that they have no competing interests.

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