BMC Pregnancy and Childbirth

RESEARCH

Open Access

The prevalence of episiotomy and associated factors at Shahrara Teaching Hospital in Kabul, Afghanistan

Parvin Golzareh[1], Sadaf Sultani[1], Erin M. Mann[2*] and Khair Mohammad Mohammadi[3]

Abstract

Background Episiotomy is done to expand the birth canal but can cause serious complications. It is still commonly performed in many parts of the world representing a quality-of-care and quality-of-life challenge. There is currently no data regarding the prevalence of episiotomy in Afghanistan. The aim of this study was to determine the prevalence of episiotomy and associated factors in women who delivered at a teaching hospital in Kabul, Afghanistan.

Methods A retrospective, cross-sectional study was conducted at Shahrara Teaching Hospital. The study sample included all women at Shahrara Teaching Hospital with vaginal delivery during the first six months of 2023. Demographic and clinical information was gathered from medical records. Descriptive statistics were calculated. Logistic regression was performed to assess the independent predictors of episiotomy.

Results A total of 1,288 women had vaginal delivery during the study period and 306 (23.76%) delivered using episiotomy. Higher parity was associated with lower odds of episiotomy (OR: 0.01 95% CI 0.007–0.022; $p < 0.0001$) and a longer duration of labor during stage 2 was associated with higher odds of episiotomy (OR: 1.04 95% CI 1.01–1.07; $p = 0.02$). An association between Apgar score at the first minute of birth was also associated with higher odds of episiotomy (OR: 1.72 95% CI 0.98–3.03; $p = 0.06$) although this did not reach statistical significance at a value of $p < 0.05$. Also of note, the majority of patients received oxytocin (72.2%) and only 1 vacuum delivery was performed representing two additional quality-of-care issues.

Conclusions This study is the first to estimate the prevalence of episiotomy in Afghanistan. The rate of episiotomy found in this study was higher than WHO recommendations but lower compared to studies from other low-income or middle-income countries in Asia and Africa. Additional efforts, including national guidelines or policies and workforce training, are needed to further reduce the rate.

Keywords Episiotomy, Parity, Afghanistan, Quality of care, Quality of life

*Correspondence:
Erin M. Mann
mann0255@umn.edu
[1]Enhanced Midwifery Skills Department, School of Midwifery, Kabul University of Medical Sciences "Abu Ali Ibn Sina", Kabul, Afghanistan
[2]Center for Global Health and Social Responsibility, University of Minnesota, Mayo Building Suite C311, MMC 329 420 Delaware St SE, Minneapolis, MN 55455, USA
[3]Epidemiology and Biostatistics Department, School of Public Health, Kabul University of Medical Sciences "Abu Ali Ibn Sina", Kabul, Afghanistan

Background

Episiotomy is the most common incision of the perineal muscles in the second stage of labor, which is done to expand the birth canal [1]. Until 1990, routine episiotomy was considered part of standard delivery management. It was believed that episiotomy prevented lacerations and brain damage to the baby, but later it was found that this operation can cause the development of tears in the perineum and worsen lacerations [2]. Many studies show that episiotomy can cause pain in the perineum, problems related to wounds and infections, and dyspareunia in the postpartum period [3–5]. The results of a study conducted at the Aga Khan University of Pakistan found that episiotomy can have short-term and long-term complications such as perineal rupture, postpartum bleeding, episiotomy extension, perineal pain, disturbance in the excretion of urine and feces and vaginal hematoma [6]. Studies show that women who experience episiotomy are twice as likely to experience pain and difficulties with wound healing postpartum [5]. The ongoing and routine use of episiotomy represents a quality-of-care and quality-of-life challenge in the field of global maternal health.

Today routine episiotomy is not recommended [7]. However, rates of episiotomy vary widely across the world. In the United States, the rate of episiotomy has decreased over time from 20.3% in 2002 to 9.4% in 2011 [2]. The majority of European countries have episiotomy rates between 16 and 38% of all vaginal deliveries [8]. Studies have found that the prevalence of episiotomy in African countries and low-income or middle-income countries of Asia is higher than the rate of 10% recommended by WHO [9, 10]. Specifically, the rate of episiotomy is estimated to be 41.7% in African countries [9], 52.0% in Turkey [11], 66.0% in Oman [12], 51.6% in Yemen [13], 41.5% in Iran [14], 50.47% in Pakistan [15], and 63.4% in India [16]. Risk factors for episiotomy include nulliparity, younger age of the mother, a duration of the second stage of labor more than 90 min, instrumental and breech vaginal deliveries, a birth weight of more than 4000 g, older gestational age, birth in private health centers, having a history of circumcision, and living in rural areas [17–22].

Unnecessary interventions during childbirth such as episiotomy could have negative effects on women's birth experiences and increase the need for postpartum follow-up [23]. These negative effects are particularly harmful in countries such as Afghanistan which continues to face a crisis in maternal and child health with limited availability of healthcare services, including follow-up care to address postpartum complications [24]. Unfortunately, there are many challenges with the birth system in Afghanistan, including a shortage of skilled birth attendants, inadequate materials and resources in birth facilities, limited access to health facilities, and low levels of literacy and health knowledge among Afghan women [25, 26]. The Afghan birth system lacks structure and standardization, including no national guidelines or policies regarding episiotomy which may be performed at unnecessary rates based on limited training of birth attendants. However, it is unknown the extent to which episiotomy is performed in Afghanistan as this has not been previously studied and documented. There is a paucity of health services research data in general from Afghanistan. It is essential to examine maternal and child health in Afghanistan to better understand the current situation and challenges, identify gaps, and develop evidence-based policies and guidelines to improve the management of health problems and enhance the quality of maternal and child health. This study aimed to determine the prevalence of episiotomy, its associated factors in Afghanistan, and other quality-of-care metrics.

Methods

Shahrara Teaching Hospital is a public hospital affiliated with Kabul University of Medical Sciences (KUMS) in Kabul, Afghanistan. Shahrara Teaching Hospital is within the public health system of Afghanistan and under the Ministry of Higher Education. Under the supervision of senior medical doctors, deliveries at Shahrara Teaching Hospital are performed by medical doctor trainees in gynecology and midwives. The Ministry of Public Health in Afghanistan is the national governing body for health care services but there are limited guidelines, including for labor and delivery. Staff shortages combined with high workloads are frequent challenges at health facilities in Afghanistan and hinder staff's ability to follow existing guidelines [25]. While the Afghan government pays for the majority of services, patients are responsible for paying an admission fee and for fees related to laboratory tests and medications which can be difficult for some patients to pay. The admission fee at Shahrara Teaching Hospital ranges from the equivalent of USD 1.50 for vaginal delivery to USD 14 for cesarean section.

A retrospective, cross-sectional study was conducted at Shahrara Teaching Hospital. The inclusion criteria were all women who came to Shahrara Teaching Hospital between January 1, 2023 and June 30, 2023 for vaginal delivery and the exclusion criteria were women who had cesarean delivery. Women who came to the hospital for vaginal delivery during the study period but who left the hospital before delivery were not included in the study ($n = 9$). Demographic and clinical information related to the deliveries were extracted from routine medical records maintained by the hospital by the study team, specifically by two faculty members at the School of Midwifery at KUMS. During the study design phase, only variables with complete (no missing) information relevant to the study were considered for extraction. The

Table 1 Sociodemographic characteristics of mothers who gave birth at Shahrara Teaching Hospital (Kabul), 2023

Variable	*N* (%)	Mean ± SD
Age (in year)		
≤ 18	54 (4.2)	26.17 ± 5.41
19–35	1152 (89.4)	
≥ 36	82 (6.4)	
Educational Status		
Illiterate	773 (60.0)	
Up to grade 12	480 (37.3)	
Academic degree	35 (2.7)	
Place of Residence		
Kabul	1288 (100)	
Others	0 (0)	

Table 2 Obstetric characteristics among mothers who gave birth at Shahrara Teaching Hospital (Kabul), 2023

Variable	*N* (%)	Mean ± SD
Gestational Age		
≤ 37	346 (26.9)	38.05 ± 1.97
38–41	927 (72.0)	
≥ 42	15 (1.2)	
Parity		
Nulliparous	317 (24.6)	2.20 ± 2.04
Para ≥ 1	971 (75.4)	
Duration of Labor (from Active Phase) (minutes)		
≤ 360	995 (77.3)	284.73 ± 108.33
≥ 360	293 (22.8)	
Duration of Active Phase (minutes)		
≤ 180	787 (61.1)	194.45 ± 104.24
≥ 180	501 (38.9)	
Duration of Second Stage of Labor (minutes)		
≤ 30	1123 (87.2)	25.22 ± 11.72
≥ 30	165 (12.8)	
Oxytocin Use		
Yes	930 (72.2)	
No	358 (27.8)	
Analgesic Use		
Yes	0 (0)	
No	1288 (100)	
Vacuum Use		
Yes	1 (0.1)	
No	1287 (99.9)	
Weight of Newborn (grams)		
≤ 1500	4 (0.31)	3262.03 ± 447.64
1500–2500	37 (2.9)	
2500–4000	1215 (94.3)	
≥ 4000	32 (2.5)	
First Minute Apgar Score		
7–10	1247 (96.8)	8.23 ± 0.91
4–6	37 (2.9)	
0–3	4 (0.3)	
Fifth Minute Apgar score		
7–10	1279 (99.3)	9.46 ± 0.72
4–6	9 (0.7)	
0–3	0 (0)	

variables extracted from the medical records included the mother's age, educational status, place of residence, gestational age, parity, use of oxytocin during labor, use of analgesics during labor, length of all stages of labor, vacuum delivery, baby's weight, and the Apgar score of the first and fifth minutes.

The local Ethics Committee at the research center of Kabul University of Medical Sciences issued a research permit after a review of the proposed study. Informed consent exemptions were approved by the Ethics Committee due to the retrospective nature of this study. Following approval, data from the medical records were extracted by the researchers.

Descriptive statistics were calculated to summarize the demographic and clinical characteristics of the study population. Chi-square tests were conducted to examine the association between episiotomy and various categorical variables. The significance level was set at $p < 0.05$. Logistic regression analysis was performed to assess the independent predictors of episiotomy while controlling for potential confounding variables. All statistical analyses were conducted using STATA (version 17).

Results

During the study period, there were 2,109 births delivered at Shahrara Teaching Hospital. Of these, 821 were cesarean delivery (including 740 acute and 81 elective). A total of 1,288 women had vaginal delivery during the study period. To avoid any potential bias, all women meeting the study criteria were included. Likewise, complete data were collected for all women for all study variables. Regarding the sociodemographic characteristics of the study sample, most were 19–35 years old (89.4%), illiterate (60.0%) and all were residents of Kabul (Table 1). Regarding the obstetric characteristics of mothers who gave birth at Shahrara Teaching Hospital, most of them were term (72%) and multiparous (75.4%) (Table 2). The mean duration of labor was 285 min. The mean duration of the active phase was 194 min and the mean duration of the second stage of labor was 25 min. 72% of women received oxytocin, one delivered by vacuum, and none received analgesic drugs. Most babies (94.3%) had normal weight (between 2,500 and 4,000 g). An Apgar score between 7 and 10 was observed among 96.8% of babies in the first minute after birth and among 99.3% in the fifth minute after birth.

Among the 1,288 women in the study, 306 (23.76%) received an episiotomy. The procedure was performed more frequently among women 18 years or younger (77.77%), with an academic degree (51.42%), who were nulliparous (91.17%), and who experienced a second stage of labor longer than 30 min (63.03%). Table 3 summarizes the results of cross-tabulations of episiotomy with categorical variables.

Table 3 Factors associated with episiotomy among mothers who gave birth at Shahrara Teaching Hospital (Kabul), 2023

Variable	Episiotomy		
	Yes *N* (%)	No *N* (%)	*P* value
Age (in year)			
≤ 18	42 (77.77)	12 (22.22)	< 0.001
19–35	264 (22.91)	888 (77.08)	
≥ 36	0	82 (100)	
Educational Status			
Illiterate	157 (20.31)	616 (79.68)	< 0.001
Up to grade 12	131 (27.29)	349 (72.71)	
Academic degree	18 (51.42)	17 (48.57)	
Place of Residence			
Kabul	306 (23.75)	982 (76.25)	-
Others	0 (0)	0 (0)	
Gestational Age			
≤ 37	80 (23.12)	266 (76.880)	0.588
38–41	224 (24.16)	703 (75.84)	
≥ 42	2 (13.33)	13 (86.67)	
Parity			
Nulliparous	289 (91.17)	28 (8.83)	< 0.001
Para ≥ 1	17 (1.75)	954 (98.25)	
Duration of Labor (from Active Phase) (minutes)			
≤ 360	159 (15.98)	836 (84.02)	< 0.001
≥ 360	147 (50.17)	146 (49.83)	
Duration of Active Phase (minutes)			
≤ 180	101 (12.83)	686 (76.17)	< 0.001
≥ 180	205 (40.92)	296 (59.08)	
Duration of Second Stage of Labor (minutes)			
≤ 30	202 (17.99)	921 (82.01)	< 0.001
≥ 30	104 (63.03)	61 (36.97)	
Oxytocin Use			
Yes	251 (26.99)	679 (73.01)	< 0.001
No	55 (15.36)	303 (84.64)	
Analgesic Use			
Yes	0 (0)	0 (0)	-
No	306 (23.75)	982 (76.25)	
Vacuum Use			
Yes	1 (100)	0 (0)	-
No	305 (23.70)	982 (76.30)	
Weight of Newborn (grams)			
≤ 1500	1 (25)	3 (75)	0.001
1500–2500	17 (45.95)	20 (54.05)	
2500–4000	287 (23.62)	928 (76.38)	
≥ 4000	1 (3.12)	31 (96.88)	
First Minute Apgar Score			
7–10	295 (23.66)	952 (76.34)	0.371
4–6	11 (29.73)	26 (70.27)	
0–3	0 (0)	4 (100)	
Fifth Minute Apgar Score			
7–10	304 (23.77)	975 (76.23)	0.914
4–6	2 (22.22)	7 (77.77)	
0–3	0 (0)	0 (0)	

Table 4 Results of logistic regression estimating factors associated with episiotomy among mothers who gave birth at Shahrara Teaching Hospital (Kabul), 2023

Predictor	OR	95% CI	*p*-value
Age	0.98	0.89–1.06	0.58
Education	1.11	0.67–1.85	0.68
Gestational age	1.07	0.97–1.18	0.19
Parity	0.01	0.006–0.02	< 0.0001
Duration of labor (Total)	0.99	0.99–1.01	0.88
Duration of labor (Stage 1)	1.00	0.99–1.02	0.70
Duration of labor (Stage 2)	1.04	1.01–1.07	0.02
Oxytocin	1.02	0.51–2.04	0.96
Weight of newborn	0.99	0.99–1.00	0.17
First minute Apgar score	1.72	0.98–3.03	0.06
Fifth minute Apgar score	0.62	0.32–1.19	0.15

A logistic regression model was fit with episiotomy as the dependent variable and age, education, gestational age, parity, total duration of labor, duration of labor during stage 1, duration of labor during stage 2, oxytocin use, the weight of the newborn, Agar score at the first minute after birth and Apgar score at the fifth minute after birth as the independent variables. After controlling for these variables, higher parity was associated with lower odds of episiotomy (OR: 0.01, 95% CI 0.006–0.022; $p < 0.0001$) and a longer duration of labor during stage 2 was associated with higher odds of episiotomy (OR: 1.04 95% CI 1.01–1.07; $p = 0.02$). An association between Apgar score at the first minute of birth was also associated with higher odds of episiotomy (OR: 1.72 95% CI 0.98–3.03; $p = 0.06$) although this did not reach statistical significance at a value of $p < 0.05$. The full results of the logistic regression are summarized in Table 4.

Discussion

This study is the first to estimate the prevalence of episiotomy and examine associated factors in Afghanistan. There are multiple reasons that episiotomy may be performed. Previous studies from other parts of the world have found that episiotomy has been used to speed up labor when complications such as poor fetal heart rate occur, when women have short perineum, especially in primigravida women, and to manage and control the pace of deliveries when healthcare personnel face strenuous workloads [27–30]. The results of this study revealed that the prevalence of episiotomy among women who gave birth at Shahrara Teaching Hospital affiliated with Kabul University of Medical Sciences was 23.76%.

The findings of our study show that despite many challenges in maternal and child health care in Afghanistan and the need to further decrease the rate to reach the WHO recommendations, the prevalence of episiotomy in this country is lower than in other low-income or middle-income countries. For example, the prevalence

of episiotomy ranged from 35.2 to 47.7% in Ethiopia [31, 32]. A descriptive cross-sectional study conducted by Rasouli et al. (2016) in Iran found that among 978 cases of vaginal childbirth, 406 (41.5%) had episiotomy [14]. Izuka et al. (2014) conducted a cross-sectional study in Nigeria and found that the prevalence of episiotomy was 62.1% [18]. The results of a study in Yemen in 2022 showed 51.6% of participants underwent episiotomy [13].

Regarding predictors of episiotomy, lower parity and duration of the second stage of labor were predictors of episiotomy in our study. This study contributes to the literature regarding episiotomy practice and parity [13, 18, 31, 32]. Our study found a higher prevalence of episiotomy (91.2%) in primiparous women than Izuka et al. in Nigeria (62.1%) [18], Al-Ghammari et al. in Oman (66%) [12] and 61.45% in Ethiopia [33]. Therefore there is a strong need to develop optimal birth guidelines and training for birth attendants to limit the rate of episiotomy in nulliparous women. The prevalence of episiotomy was very low among multiparous women (only 6%) compared to nulliparous women in our study, while results of a systematic review and meta-analysis in Ethiopia found the prevalence of episiotomy in multiparous women to be high (30.47%) [33]. One reason for the low prevalence in our study could be that mothers in Afghanistan may have higher parity compared to other countries. Further studies are suggested to examine this.

Notably, other studies have found an association between episiotomy and factors such as mother's age, first and fifth-minute Apgar scores, use of oxytocin, vacuum deliveries, and use of analgesics [13], urban residence, weight above 4000 g and older gestational age [17, 18, 32] where we did not find any association. As all women in our study were residents of Kabul (an urban area), we could not examine the association between residence and episiotomy. In addition, only one vacuum delivery was done in our study, therefore we could not examine the association between vacuum delivery and episiotomy.

Another important finding of our study was that the majority of participants (72.2%) received oxytocin – a very high percentage, especially considering that most of the participants (75.4%) were multiparous women. One reason for the high level of oxytocin usage could be the lack of effective policies and national guidelines that limit its use during routine childbirth. Another contributing factor may be a lack of attention from birth attendants to the appropriate application of oxytocin, its indications, and, more importantly, its potential adverse effects on both the mother and child. Oxytocin use can increase the risk of adverse perinatal outcomes and should therefore be limited to appropriate indications [34, 35]. Implementing regulatory policies and providing training for birth attendants on the proper use of oxytocin are essential steps to address this issue. High oxytocin use may also increase the likelihood of poor fetal heart rate which could make it necessary to perform an episiotomy [27, 28, 34, 36]. Evidence from other studies highlights concerning levels of oxytocin usage in low-income or middle-income countries [35]. However, our study did not find an association between oxytocin use and episiotomy. Further studies involving larger populations, diverse health facilities, and considerations of parity are recommended.

Only one vacuum delivery was performed in our study which is very low compared to other studies. The prevalence of operative vaginal delivery has been previously reported as 10–16% [37–39]. Operative vaginal delivery including vacuum is a manner to address complications that can occur during the second stage of labor and it could decrease the rate of cesarean section [40]. In this study, we found that 821 out of 2,109 births (39%) were cesarean deliveries – higher than the rate in other low-income or middle-income countries (11.9–28.3%) [41, 42], and also higher than the global rate reported by the WHO in 2021 (21%) [43, 44]. One reason for this high rate of cesarean section could be less vacuum application among women at Shahrara Teaching Hospital. This finding illustrates the need for a strong training plan for midwives and other birth attendants to apply vacuum during vaginal births whenever it is indicated to decrease the use of cesarean section.

While this study contributes new knowledge related to episiotomy, related factors, and other quality-of-care metrics in Afghanistan, the study has some limitations to note. First, the entire study sample was residents of Kabul. It is possible that our findings are not representative of other regions of Afghanistan. Likewise, while our sample size was large (over 1,200), data was only collected for 6 months. It is possible that a longer study duration would have identified a different prevalence of episiotomy. Finally, the study relied on cross-sectional medical record data collected at the time of delivery and therefore the study could not examine postpartum complications such as tears, episiotomy-related infection, or readmissions postpartum.

Conclusions

The prevalence of episiotomy in this study was higher than WHO recommendations but lower than the rates observed in studies performed in Yemen, Iran, Pakistan, Ethiopia, and Nigeria. However, the prevalence of episiotomy in primiparous women was found to be higher compared to other countries. Our study found that higher parity was associated with a lower odds of episiotomy and a longer duration of labor during stage 2 was associated with a higher odds of episiotomy. An association between Apgar score at the first minute of birth was

also associated with higher odds of episiotomy although this did not reach statistical significance at a value of $p < 0.05$. This study also revealed an elevated and concerning rate of oxytocin use among birthing women. In addition, regarding vacuum use, there is a need to train the birth attendants in its correct utilization.

This study is the first to estimate the prevalence of episiotomy and examine associated factors in Afghanistan. While additional research is needed, these initial findings can inform the development of evidence-based policies and guidelines to reduce unnecessary episiotomy and update other healthcare practices relevant to childbirth.

Acknowledgements
Not applicable.

Author contributions
PG developed the research proposal, managed the data collection and wrote the manuscript. SS performed the data collection. EM performed statistical analyses and revised the manuscript. KMM performed data cleaning and collaboration in statistical analyses and arranging tables. All authors contributed to final review and approval of the manuscript.

Funding
None to be declared.

Data availability
The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
The local Ethics Committee at the research center of Kabul University of Medical Sciences issued a research permit after review of the proposed study.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Received: 14 May 2024 / Accepted: 16 January 2025
Published online: 31 January 2025

References

1. Jovanovic NS, Kocijancic DM, Terzic MM. Current approach to episiotomy: Inevitable or unnecessary? cent.eur.j.med. 2011 [cited 2024 Feb 17];6:685–90. Available from: https://doi.org/10.2478/s11536-011-0088-z
2. Kozhimannil KB, Karaca-Mandic P, Blauer-Peterson CJ, Shah NT, Snowden JM. Uptake and utilization of Practice guidelines in hospitals in the United States: the case of Routine Episiotomy. Jt Comm J Qual Patient Saf. 2017;43:41–8.
3. Tariq AAF, Alharthy RAA, Alsolimani RM, Alshawmali GM, Bin Jabal NA, Alrowaizen SB et al. An Overview on Episiotomy: Indications, Risk Factors, and Complications. International Journal of Pharmaceutical Research & Allied Sciences. 2020 [cited 2024 Feb 17];9:39–42. Available from: http://login.ezproxy.lib.umn.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=aph&AN=146667690&site=ehost-live
4. Khajavi Shojaie K, Zayeri AD. F. Frequency and side effect of episiotomy in Primiparous women: A Three- Month Longitudinal Survey. Volume 3. Qom University of Medical Sciences Journal. 2009.
5. Karaçam Z, Ekmen H, Calişır H, Seker S. Prevalence of episiotomy in primiparas, related conditions, and effects of episiotomy on suture materials used, perineal pain, wound healing 3 weeks postpartum, in Turkey: a prospective follow-up study. Iran J Nurs Midwifery Res. 2013;18:237–45.
6. Khan NB, Anjum N, Hoodbhoy Z, Khoso R. Episiotomy and its complications: a cross sectional study in secondary care hospital. J Pak Med Assoc. 2020;70:2036–8.
7. King TL, Brucker MC, Osborne K, Jevitt C. ProQuest. Varney's midwifery. Sixth edition. Burlington, Massachusetts: Jones & Bartlett Learning. 2019.
8. Blondel B, Alexander S, Bjarnadóttir RI, Gissler M, Langhoff-Roos J, Novak-Antolič Ž, et al. Variations in rates of severe perineal tears and episiotomies in 20 European countries: a study based on routine national data in Euro-Peristat Project. Acta Obstet Gynecol Scand. 2016;95:746–54.
9. Woldegeorgis BZ, Obsa MS, Tolu LB, Bogino EA, Boda TI, Alemu HB. Episiotomy Practice and its Associated factors in Africa: a systematic review and Meta-analysis. Front Med (Lausanne). 2022;9:905174.
10. Clesse C, Lighezzolo-Alnot J, De Lavergne S, Hamlin S, Scheffler M. Statistical trends of episiotomy around the world: comparative systematic review of changing practices. Health Care Women Int. 2018;39:644–62.
11. Kartal B, Kızılırmak A, Calpbinici P, Demir G. Retrospective analysis of episiotomy prevalence. J Turk Ger Gynecol Assoc. 2017;18:190–4.
12. Al-Ghammari K, Al-Riyami Z, Al-Moqbali M, Al-Marjabi F, Al-Mahrouqi B, Al-Khatri A, et al. Predictors of routine episiotomy in primigravida women in Oman. Appl Nurs Res. 2016;29:131–5.
13. Khan NY, Naji SA. Episiotomy at the Asha'ab obstetric emergency center, Aden, Yemen: Prevalence, clinical profile, and complications. Yemen Journal of Medicine. 2022 [cited 2024 Feb 17];1:85–8. Available from: https://mansapublishers.com/index.php/yjm/article/view/3686
14. Rasouli M, Keramat A, Khosravi A, Mohabatpour Z. Prevalence and factors Associated with Episiotomy in Shahroud City, Northeast of Iran. Int J Women's Health Reprod Sci. 2016;4:125–9.
15. Majeed T, Waheed F, Naheed M, Afzal S, Mahmood Z. The changing trends in episiotomy in the allied teaching hospitals of Rawalpindi Medical College. PAK J MED HEALTH SCI. 2018;12:595–7.
16. Singh S, Thakur T, Chandhiok N, Dhillon BS. Pattern of episiotomy use & its immediate complications among vaginal deliveries in 18 tertiary care hospitals in India. Indian J Med Res. 2016 [cited 2024 Feb 17];143:474–80. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4928554/
17. Aguiar BM, da Silva TPR, Pereira SL, Sousa AMM, Guerra RB, de Souza KV, et al. Factors associated with the performance of episiotomy. Rev Bras Enferm. 2020;73:e20190899.
18. Izuka E, Dim C, Chigbu C, Obiora-Izuka C. Prevalence and Predictors of Episiotomy Among Women at First Birth in Enugu, South-East Nigeria. Ann Med Health Sci Res. 2014 [cited 2024 Feb 17];4:928–32. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4250993/
19. Teshome Y. Prevalence of episiotomy and its associated factors in University of Gondar Comprehensive Specialized Referral Hospital: a retrospective study from Ethiopia. Am J Life Sci. 2020;8:9–13.
20. Workie T, Egata GMA (PhD), Ayalew DCAM, editors. Episiotomy Practice and Associated Factors Among Laboring Mothers in Gelemso General Hospital and Health Center, Oromia Regional State, Eastern Ethiopia. Does Circumcision Matter in the Era of No More Episiotomy [Thesis]. 2015 [cited 2024 Feb 17]. Available from: http://ir.haramaya.edu.et//hru/handle/123456789/3336
21. Tefera T, Kebede B, Mekonen T. Prevalence of episiotomy and Factors Associated with Practice of Episiotomy at Saint Paul's Hospital Millennium Medical College: a cross-sectional study. Ethiop J Reproductive Health. 2019;11:33–40.
22. Garba I, Ozegya MS, Abubakar IS, Ayyuba R. Episiotomy at Aminu Kano Teaching Hospital, Kano, Nigeria: A 3-Year Review. Archives of International Surgery. 2016 [cited 2024 Feb 17];6:17. Available from: https://www.archintsurg.org/article.asp?issn=2278-9596;year=2016;volume=6;issue=1;spage=17;epage=21;aulast=Garba;type=0
23. Çalik KY, Karabulutlu Ö, Yavuz C. First do no harm - interventions during labor and maternal satisfaction: a descriptive cross-sectional study. BMC Pregnancy and Childbirth. 2018 [cited 2024 Dec 3];18:415. Available from: https://doi.org/10.1186/s12884-018-2054-0
24. Glass N, Jalalzai R, Spiegel P, Rubenstein L. The crisis of maternal and child health in Afghanistan. Conflict and Health. 2023 [cited 2024 Dec 3];17:28. Available from: https://doi.org/10.1186/s13031-023-00522-z
25. Tharwani ZH, Kumar P, Shaeen SK, Islam Z, Essar MY, Ahmad S. Maternal mortality in Afghanistan: Challenges, efforts, and recommendations. Clinical Epidemiology and Global Health. 2022 [cited 2024 Dec 3];15:101038. Available from: https://www.sciencedirect.com/science/article/pii/S221339842200080X
26. Rostamzadeh M, Ezadi Z, Hosseini M, Husseini AA. Maternal health literacy and pregnancy outcomes in Afghanistan. J Educ Health Promot. 2022;11:421.

27. Wu LC, Malhotra R, Allen JC, Lie D, Tan TC, Østbye T. Risk factors and midwife-reported reasons for episiotomy in women undergoing normal vaginal delivery. Arch Gynecol Obstet. 2013;288:1249–56.
28. Ahmed HM. Midwives' clinical reasons for performing episiotomies in the Kurdistan Region: are they evidence-based? Sultan Qaboos Univ Med J. 2014;14:e369–374.
29. Rodrigues S, Silva P, Vieira R, Duarte A, Escuriet R. Midwives' practices on perineal protection and episiotomy decision-making: a qualitative and descriptive study. Eur J Midwifery. 2024;8.
30. Schantz C, Sim KL, Ly EM, Barennes H, Sudaroth S, Goyet S. Reasons for routine episiotomy: a mixed-methods study in a large maternity hospital in Phnom Penh, Cambodia. Reprod Health Matters. 2015;23:68–77.
31. Abate E, Alemu A, Hailu G. The proportion of episiotomy and associated factors among mothers who gave birth at public institutions, Northwest Ethiopia: a cross-sectional study. Research Square (Research Square). 2023.
32. Worku SA, Mitku YM, Getahun SA. Episiotomy Practice and its Associated Factor among Women Who Gave Birth at Public Health Institutions of Akaki Kality in Addis Ababa, Ethiopia. Clinics in Mother and Child Health. 2019 [cited 2024 Feb 17];16. Available from: https://scholar.google.com/scholar_lookup?journal=Clin+Mother+Child+Health&title=Episiotomy+practice+and+its+associated+factor+among+women+who+gave+birth+at+Public+Health+Institutions+of+Akaki+Kality+in+Addis+Ababa,+Ethiopia&author=S+Worku&author=Y+Mitku&author=S+Getahun&volume=16&publication_year=2019&pages=318&amp.
33. Aragaw FM, Belay DG, Endalew M, Asratie MH, Gashaw M, Tsega NT. Level of episiotomy practice and its disparity among primiparous and multiparous women in Ethiopia: a systematic review and meta-analysis. Front Glob Womens Health. 2023 [cited 2024 Dec 3];4. Available from: https://www.frontiersin.org/journals/global-womens-health/articles/https://doi.org/10.3389/fgwh.2023.1153640/full
34. Litorp H, Sunny AK, Kc A. Augmentation of labor with oxytocin and its association with delivery outcomes: A large-scale cohort study in 12 public hospitals in Nepal. Acta Obstetricia et Gynecologica Scandinavica. 2021 [cited 2025 Jan 10];100:684–93. Available from: https://onlinelibrary.wiley.com/doi/abs/https://doi.org/10.1111/aogs.13919
35. Kujabi ML, Mikkelsen E, Housseine N, Obel J, D'Mello BS, Meyrowitsch DW et al. Labor augmentation with oxytocin in low- and lower-middle-income countries: a systematic review and meta-analysis. AJOG Glob Rep. 2022 [cited 2024 Dec 3];2:100123. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9664020/
36. Wang J, Kim J, Shao W, Nam S, Hong S-C. Effect of oxytocin injection on fetal heart rate based on multifractal analysis., Chaos, Solitons. & Fractals. 2021 [cited 2025 Jan 10];148:111045. Available from: https://www.sciencedirect.com/science/article/pii/S0960077921003994
37. Tadesse WK, Bekele NT, Negussie YM, Getahun MS, Gurara AM, Beyen TK. Magnitude, indications, and factors Associated with operative vaginal delivery among mothers who gave birth at Adama Hospital Medical College, Ethiopia, 2022. SAGE Open Nurs. 2023;9:23779608231180382.
38. Hubena Z, Workneh A, Siraneh Y. Prevalence and Outcome of Operative Vaginal Delivery among Mothers Who Gave Birth at Jimma University Medical Center, Southwest Ethiopia. J Pregnancy. 2018 [cited 2024 Dec 3];2018:7423475. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6076915/
39. Balis B, Debella A, Ketema I, Eshetu B, Zerihun E, Deressa Wayesa A et al. Prevalence, indications, and outcomes of operative vaginal deliveries among mothers who gave birth in Ethiopia: A systematic review and meta-analysis. Front Glob Womens Health. 2022 [cited 2024 Dec 3];3. Available from: https://www.frontiersin.org/journals/global-womens-health/articles/https://doi.org/10.3389/fgwh.2022.948288/full
40. Ogunwale AN, Coleman MA, Sangi-Haghpeykar H, Valverde I, Montealegre J, Jibaja-Weiss M et al. Assessment of factors impacting cervical cancer screening among low-income women living with HIV-AIDS. AIDS Care. 2016 [cited 2024 Dec 3];28:491–4. Available from: https://www.tandfonline.com/doi/full/https://doi.org/10.1080/09540121.2015.1100703
41. Habteyes AT, Mekuria MD, Negeri HA, Kassa RT, Deribe LK, Sendo EG. Prevalence and associated factors of caesarean section among mothers who gave birth across Eastern Africa countries: Systematic review and meta-analysis study. Heliyon. 2024 [cited 2024 Dec 3];10:e32511. Available from: https://www.sciencedirect.com/science/article/pii/S2405844024085426
42. Osayande I, Ogunyemi O, Gwacham-Anisiobi U, Olaniran A, Yaya S, Banke-Thomas A. Prevalence, indications, and complications of caesarean section in health facilities across Nigeria: a systematic review and meta-analysis. Reproductive Health. 2023 [cited 2024 Dec 3];20:81. Available from: https://doi.org/10.1186/s12978-023-01598-9
43. World Health Organization. Caesarean section rates continue to rise, amid growing inequalities in access. [cited 2024 Dec 3]. Available from: https://www.who.int/news/item/16-06-2021-caesarean-section-rates-continue-to-rise-amid-growing-inequalities-in-access
44. Betran AP, Ye J, Moller A-B, Souza JP, Zhang J. Trends and projections of caesarean section rates: global and regional estimates. BMJ Glob Health. 2021;6:e005671.

Publisher's note