

# BMJ Open Episiotomy practice in six Palestinian hospitals: a population-based cohort study among singleton vaginal births

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## ABSTRACT

**Objective** To explore the rates, characteristics and indications for episiotomy among women delivering vaginally for the first time, as well as parous women.

**Study design** A prospective, population-based birth cohort study.

**Setting** Obstetric departments in six Palestinian government hospitals.

**Participants** All women with singleton vaginal births (n=29 165) from 1 March 2015 until 1 March 2016.

**Methods** All women were divided into two groups: first vaginal birth group (n=9108), including primiparous women and women with their first vaginal birth after one caesarean section, and the parous group (n=20 057). Each group was analysed separately. Data were presented as numbers and percentages or range. Differences in rates were assessed by the p values of  $\chi^2$  test, or Fisher's exact test if there are cell counts less than 5.

**Main outcome measures** Episiotomy rates and indications among women of singleton births.

**Results** The overall episiotomy rate was 28.7%: 78.8% for women with first vaginal birth (range 56.6%–86.0%) and 5.9% for parous women (range 1.0%–9.5%). The most common indications for episiotomy were 'primiparity' in the first vaginal birth group (69.9%) and 'protecting the perineum' in the parous group (59.5%). The least common indications were prolonged second stage (1.5%) and fetal distress (6.9%), respectively.

**Conclusion** In Palestine, the majority of women who delivered vaginally for the first time had an episiotomy. Education of birth attendants, clinical audits, educational interventions and adherence to the updated guidelines may help to decrease the routine overuse of episiotomy.

## INTRODUCTION

Episiotomy was introduced across Europe in 1742, as widening of the vaginal opening was believed to accelerate labour, protect the fetal head and prevent severe obstetrical anal sphincter injuries (OASIS).<sup>1</sup> Nowadays, there is general agreement on the restrictive use of episiotomy. Although episiotomy should be done only when indicated, many countries still practise it routinely.<sup>2,3</sup> However, some possible complications, such as wound infection, wound dehiscence, blood loss,

## Strengths and limitations of this study

- This study is the largest, prospective, population-based cohort study in Palestine that includes hospitals from different geographical areas in both Gaza and the West Bank, and thus allowed a comprehensive insight into episiotomy practice in Palestine.
- All singleton pregnant women aiming to give birth vaginally in six study hospitals were included, reducing the risk of selection bias.
- The study included six government hospitals in Palestine and most of the deliveries occur in government hospitals, making the findings of the study representative.
- Missing data occurred in some variables across the study hospitals, which are expected to be random and therefore not influencing the outcome.
- The study did not include data from private hospitals; even though the number of deliveries is small, this study cannot assess episiotomy practice in these hospitals.

severe pain and the risk of OASIS,<sup>3</sup> have led to efforts to reduce the overuse of episiotomy, which started more than 30 years ago.<sup>4</sup> Additionally, many studies have reported that the rate of perineal tears may increase with routine episiotomy use.<sup>3,5</sup>

The rates of episiotomy vary between countries.<sup>6</sup> One European study reported episiotomy rates from 3.7% in Denmark to 75% in Cyprus.<sup>7</sup> In Arab countries the rates of episiotomy are still high: 41.4% in Jordan,<sup>8</sup> 52.2% in Saudi Arabia,<sup>9</sup> 62% in Lebanon and 64% in United Arab Emirates.<sup>10</sup>

There are few studies exploring the rates of episiotomy in Palestine. One was an observational hospital-based study between 2002 and 2003, which reported that six out of eight Palestinian government hospitals routinely used episiotomy in primiparous women.<sup>11</sup> Another, based on the data obtained from the Palestinian Central Bureau of Statistics, showed that the overall episiotomy rate



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in Palestine in 2004 was 13.9%.<sup>12</sup> Furthermore, after the implementation of educational interventions aiming to prevent overuse of episiotomy in one maternity unit in Palestine, the rates of episiotomy decreased between 2005 and 2010, from 80% to 39.1% among primiparous women and from 5.8% to 3.4% among parous women.<sup>13</sup>

Indications for episiotomy vary between countries and are influenced by the opinion of the clinician in charge of the delivery.<sup>14</sup> Primiparity, instrumental delivery, fetal malpresentation, fetal distress, large fetal size, breech delivery, shoulder dystocia and rigid perineum are the most common indications reported for episiotomy.<sup>15–17</sup> The American College of Obstetricians and Gynecologists (ACOG) reported shortening of the second stage of labour and high risk of OASIS as the most frequent indications for episiotomy.<sup>14</sup>

The ACOG,<sup>14</sup> the Royal College of Obstetricians and Gynaecologists (RCOG),<sup>18</sup> and the National Institute for Health and Care Excellence (NICE)<sup>19</sup> recommend using episiotomy on clinical indications only. Furthermore, in its most recent publication in 2018, the WHO also suggests restrictive use of episiotomy, although no specific rate is recommended.<sup>20</sup>

The objective of this study was to explore the rates, characteristics and indications for episiotomy in six Palestinian government hospitals.

## METHODS

### Study design and settings

This present prospective, population-based cohort study was conducted between 1 March 2015 and 1 March 2016, and was based on data from an original study called the Palestinian Perineum and Birth Complications Study. The original study was performed between March 2015 and November 2016 including all women admitted for vaginal birth in six government hospitals in Palestine.<sup>21</sup> The six hospitals—three in Gaza: hospitals 1, 2 and 3; and three in the West Bank: hospitals 4, 5 and 6—were selected according to geographical distribution and the number of deliveries in each hospital. Hospital 5 had been included in a previous study by implementing an intervention to reduce the routine use of episiotomy.<sup>13</sup> Most deliveries in Palestine occurred in government hospitals; altogether, there were 15 hospitals, with a total annual delivery number of  $n=75\,891$ , comprising almost 60% of all deliveries in Palestine.<sup>22</sup> This study included six government hospitals with a total annual delivery number of  $n=47\,046$ , comprising 61.9% of all deliveries that occurred in the government sector.<sup>22</sup> The study design, undertaking and reporting followed the Strengthening the Reporting of Observational Studies in Epidemiology statement for cohort studies.

### Data collection and population

Data were collected prospectively by birth attendants (doctors and midwives) during the whole study period under the authors' supervision (KMZ, MZ, HYA-M, SH)

using a specific case registration form (CRF).<sup>21</sup> The content of the CRF was based on previous research published from Palestine, Norway and the WHO.<sup>21</sup> The CRFs were entered into the web-based medical records called the District Health Information System 2 and subsequently transferred to the Services for Sensitive Data (TSD). The TSD is a specific secure platform developed by Oslo University to be used for collection, storage, analysis and sharing of sensitive data for research purposes to maintain data security and privacy (*tsd-drift@usit.uio.no*).

The CRF included information on indications for episiotomy, listed as primiparity, instrumental deliveries, fetal distress, prolonged second stage of labour and protecting the perineum. These indications were listed as in the hospital patient forms.

During the study period (from 1 March 2015 to 1 March 2016), 35 109 women gave birth. All cases of emergency and elective caesarean sections and multiple gestations were excluded ( $n=5944$ ). The remaining study sample consisted of 29 165 women with singleton vaginal deliveries.

Women were stratified into two groups: one group comprised women with their first vaginal birth, including women who delivered vaginally for the first time after caesarean section; and the other group comprised parous women (women who had one or more vaginal delivery). The selected study population is shown in [figure 1](#).

### Patient and public involvement

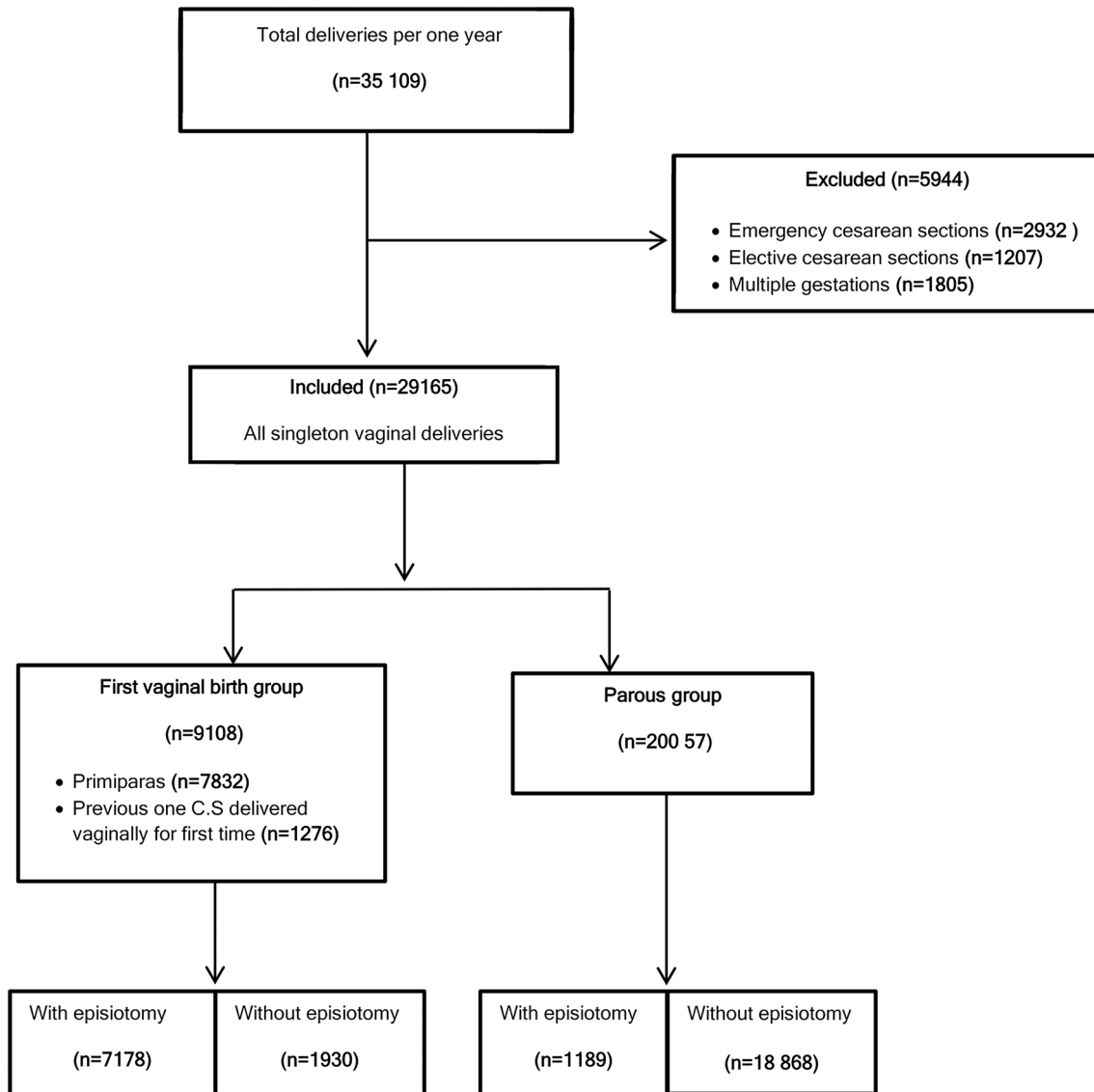
No patients were involved in setting the research question or the outcome measures, nor were they involved in developing plans for the design or implementation of the study. No patients were asked to advise on the interpretation or writing up of the results. There are no plans to disperse the results of our research to study participants or the applicable patient community. However, the findings have informed the most recent edition of the Palestinian National Guidelines for Obstetrics and Gynaecology and will as such enhance evidence-based clinical practice in Palestine.

### Variables

Episiotomy was dichotomised into yes or no ([table 1](#)). Indications for episiotomy were categorised into five groups according to hospitals' patient admission forms ([table 2](#)). Maternal age was categorised into four groups ([tables 3 and 4](#)). Fetal presentation at birth was categorised into three groups according to the presenting part during the delivery ([tables 3 and 4](#)). The duration of the active second stage of labour in minutes was categorised into 15 min duration groups ([tables 3 and 4](#)). Fetal birth weight was classified into five groups ([tables 3 and 4](#)).

### Statistical analysis

All statistical analyses were performed using SPSS V.22.0. Categorical data were presented as frequencies and percentages, and continuous data were summarised by mean and SD or range. Associations between categorical



**Figure 1** Flow chart of the selected study population. CS, caesarean section.

variables and episiotomy were assessed using Pearson's  $\chi^2$  tests (or Fisher's exact test, if there are cell counts less than 5). Statistical significance was defined as p values less than the nominal significance level of 0.05. All statistical tests were performed as two-sided tests.

## RESULTS

In total, 29 165 women with singleton vaginal birth were included in this study (83.1% of the total sample). Of these women, 9108 (31.2%) were in the first vaginal birth group, of whom 7832 (26.8%) were nulliparous and 1276 (4.4%) underwent their first vaginal birth after one caesarean section. The parous group comprised 20 057 (68.8%) women.

The overall episiotomy rate was 28.7% (ranging from 20.0% to 35.2%). The rates of episiotomy varied between hospitals, yet the rates were higher in Gaza hospitals. The overall episiotomy rate was highest in hospital 3 with 3454 (35.2%) and lowest in hospital 5 with 617 (20%).

In the first vaginal birth group, the rate of episiotomy was 78.8% (ranging from 56.8% to 86.0%; n=7178), and 77.3% of primiparous women and 88.1% of women undergoing the first vaginal birth after caesarean section had an episiotomy. In the parous group, the overall rate of episiotomy was 5.9% (ranging from 1.0% to 9.6%; n=1189) (table 1).

### First vaginal birth group

The most common indication was 'primiparity', where the highest proportion was found in hospital 1 with 79.9% (n=863) and the lowest proportion in hospital 5 with 38.2% (n=227). The least common indication was 'prolonged second stage of labor' (ranging between hospitals from 0.7% in hospital 3 and 4.5% in hospital 5) (table 2).

In this group, the mean age was 23.5 years (range: 15.0–38.0 years) and the mean duration of the active second stage of labour was 13.4min (ranging from 9.3 to 19.0min). Almost all women had a cephalic

**Table 1** Rates of episiotomy by parity and hospitals between March 2015 and March 2016 (N=29 165)

Hospitals	Total episiotomy rate n (%) <sup>*</sup>	First vaginal birth group† (n=9108) n (%)		Parous group‡ (n=20 057) n (%)	
		Episiotomy	No episiotomy	Episiotomy	No episiotomy
Gaza (n=18 666)	5873 (31.5)	4798 (81.9)	1062 (18.1)	1075 (8.4)	11 731 (91.6)
Hospital 1 (n=4475)	1378 (30.8)	1080 (81.0)	253 (19.0)	298 (9.5)	2844 (90.5)
Hospital 2 (n=4382)	1041 (23.7)	891 (71.9)	349 (28.1)	150 (4.8)	2992 (95.2)
Hospital 3 (n=9809)	3454 (35.2)	2827 (86.0)	460 (14.0)	627 (9.6)	5895 (90.4)
West Bank (n=10 499)	2494 (23.7)	2380 (73.3)	868 (26.7)	114 (1.6)	7137 (98.4)
Hospital 4 (n=5108)	1348 (26.4)	1299 (82.4)	278 (17.6)	49 (1.4)	3482 (98.6)
Hospital 5 (n=3077)	617 (20.0)	596 (56.8)	453 (43.2)	21 (1.0)	2007 (99.0)
Hospital 6 (n=2314)	529 (22.9)	485 (78.0)	137 (22.0)	44 (2.6)	1648 (97.4)
Total (N=29 165)	8367 (28.7)	7178 (78.8)	1930 (21.2)	1189 (5.9)	18 868 (94.1)

n=valid number.

<sup>\*</sup>(%=total episiotomy/total vaginal deliveries in each hospital).

†First vaginal birth group: included previous one caesarean section with first vaginal birth (number of previous one caesarean section who delivered vaginally=1276; out of these 1125 women delivered with episiotomy).

‡Parous group: included women with second or subsequent vaginal births.

presentation at birth (95.9%), and only 3.8% delivered babies weighing  $\geq 4000$  g (table 3).

### Parous group

Within the parous group, the most common indication was 'protecting the perineum' (ranging from 38.1% in hospital 5 to 88.6% in hospital 6). The least common indication was 'fetal distress' (ranging from 2.0% in hospital 4 to 10.7% in hospital 1) (table 2).

In this group, the mean age was 27.6 years (ranging from 17.0 to 45.0 years) and the mean duration of the active

second stage of labour was 11 min (range 6.2–16.0 min). Almost 97.5% had a cephalic presentation at birth and only 8.6% delivered babies weighing  $\geq 4000$  g (table 4).

### DISCUSSION

The overall episiotomy rate in six Palestinian government hospitals was almost 30.0%. Episiotomy was used for the majority of women who delivered vaginally for the first time, and the most common indication for episiotomy among primiparous women was 'primiparity.' Among

**Table 2** Indications for episiotomy by hospitals and parity

First vaginal birth group with episiotomy* (n=178), n (%)							
Indications of episiotomy	Total episiotomy indications n (%)	Hospital 1	Hospital 2	Hospital 3	Hospital 4	Hospital 5	Hospital 6
		(n=1080)	(n=891)	(n=2827)	(n=1299)	(n=596)	(n=485)
Protecting the perineum	1316 (18.3)	95 (8.8)	191 (21.4)	376 (13.3)	360 (27.7)	257 (43.1)	37 (7.6)
Fetal distress	272 (3.8)	38 (3.5)	18 (2.0)	76 (2.6)	94 (7.2)	43 (7.2)	3 (0.5)
Instrumental delivery	285 (4.0)	44 (4.1)	24 (2.7)	68 (2.4)	102 (7.8)	21 (3.5)	26 (5.4)
Prolonged second stage of labour	105 (1.5)	18 (1.7)	6 (0.8)	16 (0.7)	32 (2.5)	27 (4.5)	6 (1.2)
Primiparity	5019 (69.9)	863 (79.9)	624 (70.0)	2241 (79.3)	693 (53.4)	227 (38.2)	371 (76.6)
Missing	181 (2.5)	22 (2.0)	28 (3.1)	50 (1.7)	18 (1.4)	21 (3.5)	42 (8.7)

Parous group with episiotomy† (n=1189), n (%)							
Indications of episiotomy	Total episiotomy indications n (%)	Hospital 1	Hospital 2	Hospital 3	Hospital 4	Hospital 5	Hospital 6
		(n=298)	(n=150)	(n=627)	(n=49)	(n=21)	(n=44)
Protecting the perineum	708 (59.5)	166 (55.7)	104 (69.3)	365 (58.2)	26 (53.1)	8 (38.1)	39 (88.6)
Fetal distress	81 (6.9)	32 (10.7)	8 (5.3)	38 (6.1)	1 (2.0)	1 (4.8)	1 (2.3)
Instrumental delivery	188 (15.8)	72 (24.2)	15 (10.0)	84 (13.4)	5 (10.2)	8 (38.1)	4 (9.1)
Prolonged second stage of labour	169 (14.2)	17 (5.7)	14 (9.4)	117 (18.7)	17 (34.7)	4 (19.0)	0 (0.0)
Missing	43 (3.6)	11 (3.7)	9 (6.0)	23 (3.6)	0 (0.0)	0 (0.0)	0 (0.0)

\*First vaginal birth group included previous one caesarean section with first vaginal birth.

†Parous group included women with second or subsequent vaginal births.

**Table 3** Episiotomy rates in different subgroups of women with the first vaginal birth group by hospitals (n=9108)

First vaginal birth group*								
	Total episiotomy % (n/total)†	P values‡	Hospital 1 % (n/total)†	Hospital 2 % (n/total)†	Hospital 3 % (n/total)†	Hospital 4 % (n/total)†	Hospital 5 % (n/total)†	Hospital 6 % (n/total)†
Total	(n=9108)		(n=1333)	(n=1240)	(n=3287)	(n=1577)	(n=1049)	(n=622)
Age by years (mean±SD)	(23.5±4.7)		(24±4.3)	(23.7±4.6)	(23.0±4.5)	(23.9±5.4)	(23.8±4.5)	(22.9±3.8)
<20	80.3 (1264/1575)	<0.001	81.5 (101/124)	79.8 (142/178)	90.0 (627/697)	72.1 (248/344)	53.8 (75/140)	77.2 (71/92)
20–29	80.4 (5046/6277)		84.2 (878/1043)	72.8 (642/882)	88.6 (1917/2164)	82.7 (782/946)	57.8 (442/765)	80.7 (385/477)
30–34	76.2 (504/661)		73.4 (69/94)	64.3 (54/84)	83.2 (173/208)	91.8 (146/159)	56.2 (50/89)	44.4 (12/27)
≥35	75.4 (276/366)		57.7 (30/52)	71.5 (41/55)	80.4 (78/97)	95.5 (105/110)	43.9 (18/41)	36.4 (4/11)
Missing	38.4 (88/229)		10.0 (2/20)	29.3 (12/41)	26.4 (32/121)	100.0 (18/18)	78.6 (11/14)	86.7 (13/15)
Fetal presentation at birth								
Normal cephalic	78.9 (6901/8740)	<0.001	79.5 (1038/1305)	70.2 (858/1222)	87.3 (2721/3115)	85.4 (1245/1458)	56.3 (579/1028)	75.2 (460/612)
Occiput posterior	93.3 (42/45)		83.3 (5/6)	100.0 (5/5)	90.9 (20/22)	100.0 (11/11)	0.0 (0)	100.0 (1/1)
Breech	54.2 (13/24)		66.7 (2/3)	0.0 (0)	50.0 (3/6)	57.1 (8/14)	0.0 (0/1)	0.0 (0)
Missing	74.2 (222/299)		64.8 (35/54)	63.6 (28/44)	81.3 (83/102)	100.0 (35/35)	53.1 (17/32)	18.7 (6/32)
Active second stage of labour in minutes (mean±SD)	(13.8±8.6)		(12.6±9.6)	(9.3±6)	(13.4±5)	(13.5±8)	(19±13)	(15±10)
≤15	75.6 (4207/5567)	<0.001	77.1 (702/911)	69.9 (719/1026)	83.8 (1361/1624)	82.0 (875/1067)	49.4 (269/544)	71.7 (281/392)
16–30	84.5 (2575/3048)		88.2 (299/339)	82.5 (137/166)	89.3 (1390/1556)	82.4 (365/443)	62.5 (232/371)	87.9 (152/173)
31–45	75.5 (166/220)		90.7 (39/43)	0.0 (0/1)	81.8 (9/11)	73.3 (22/30)	64.6 (62/96)	87.2 (34/39)
46–60	86.8 (33/38)		100.0 (9/9)	0.0 (0)	0.0 (0/3)	100.0 (3/3)	75 (15/20)	100.0 (6/6)
Missing	83.8 (197/235)		100.0 (31/31)	79.5 (35/44)	69.8 (67/96)	100.0 (34/34)	100.0 (18/18)	100.0 (12/12)
Birth weight in grams (mean±SD)	(3115±458.8)		(3194±487)	(3167±476)	(3076±535)	(3046±456)	(3154±399)	(3055±400)
<2500	67.6 (478/707)		70.3 (45/64)	63.6 (49/77)	78.5 (227/289)	67.5 (100/148)	32.5 (26/80)	63.3 (31/49)
2500–2999	77.5 (1619/2090)	<0.001	80.4 (193/240)	71.1 (177/249)	85.5 (632/739)	81.4 (349/429)	54.7 (164/300)	78.2 (104/133)
3000–3499	80.8 (3136/3879)		84.3 (505/599)	73.7 (392/532)	87.5 (1142/1305)	83.9 (557/664)	61.2 (282/461)	81.1 (258/318)
3500–3999	80.6 (1546/1919)		77.6 (266/343)	72.9 (218/299)	86.0 (655/744)	87.0 (234/269)	62.4 (111/178)	70.4 (62/86)
≥4000	76.6 (268/350)		77.0 (47/61)	73.3 (33/45)	79.9 (127/159)	86.5 (45/52)	30.0 (6/20)	76.9 (10/13)
Missing	80.4 (131/163)		92.3 (24/26)	57.9 (22/38)	86.3 (44/51)	93.3 (14/15)	70.0 (7/10)	87.0 (20/23)

\*First vaginal birth group included previous one caesarean section with first vaginal birth.

†(Number within episiotomy group/total episiotomy and non-episiotomy).

‡P value of  $\chi^2$  test (not including the missing values).

**Table 4** Episiotomy rates in different subgroups of parous women by hospitals (n=20 057)

Parous group*	Total episiotomy % (n/total)†	P values‡	Hospital 1 % (n/total)†	Hospital 2 % (n/total)†	Hospital 3 % (n/total)†	Hospital 4 % (n/total)†	Hospital 5 % (n/total)†	Hospital 6 % (n/total)†
Total	(n=20 057)		(n=3142)	(n=3142)	(n=6522)	(n=3531)	(n=2028)	(n=1692)
Age by years (mean±SD)	(27.6±5.5)		(28.6±5.4)	(27.5±5.4)	(26.9±5.6)	(27.9±5.6)	(27.7±5.1)	(27.7±5.4)
<20	19.7 (125/635)	<0.001	13.6 (9/66)	11.9 (10/84)	31.3 (99/316)	2.7 (3/111)	0.0 (0/33)	16.0 (4/25)
20–29	6.8 (823/12184)		11.4 (197/1727)	4.9 (93/1910)	11.0 (460/4175)	1.6 (34/2097)	1.3 (16/1254)	2.3 (23/1021)
30–34	2.7 (113/4121)		6.9 (53/763)	3.2 (20/617)	2.4 (28/1162)	0.9 (7/760)	0.0 (0/476)	1.5 (5/343)
≥35	2.2 (56/2502)		3.9 (19/485)	2.0 (7/355)	3.2 (23/726)	0.8 (4/517)	0.9 (2/213)	0.5 (1/206)
Missing	11.7 (72/615)		19.8 (20/101)	11.4 (20/176)	11.9 (17/143)	2.2 (1/46)	5.8 (3/52)	11.3 (11/97)
Fetal presentation at birth								
Normal cephalic	5.3 (1030/19 561)	<0.001	8.3 (253/3058)	3.7 (115/3070)	8.7 (552/6351)	1.4 (47/3431)	1.0 (21/1981)	2.5 (42/1670)
Occiput posterior	17.3 (14/81)		12.5 (1/8)	11.1 (1/9)	25.6 (11/43)	8.3 (1/12)	0.0 (0/5)	0.0 (0/4)
Breech	7.4 (8/108)		22.2 (2/9)	0.0 (0/5)	15.8 (6/38)	0.0 (0/50)	0.0 (0/6)	0.0 (0/0)
Missing	44.6 (137/307)		62.7 (42/67)	58.6 (34/58)	64.4 (58/90)	2.6 (1/38)	0.0 (0/36)	11.1 (2/18)
Active second stage of labour in minutes (mean±SD)	(1.0±7.7)		(8.5±7)	(6.2±5.8)	(11±6)	(10.7±7.5)	(14±10)	(16±10)
≤15	5.2 (824/15 752)	<0.001	8.8 (237/2698)	4.3 (126/2944)	10.2 (379/3704)	1.3 (42/3141)	0.8 (14/1782)	1.8 (26/1483)
16–30	7.2 (293/4055)		10.0 (40/401)	7.5 (12/161)	7.8 (214/2744)	2.0 (7/354)	2.4 (5/208)	8.0 (15/187)
31–45	22.6 (12/53)		44.4 (4/9)	0.0 (0/1)	33.3 (3/9)	0.0 (0/8)	12.5 (2/16)	30.0 (3/10)
46–60	0.0 (0/6)		0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0/2)	0.0 (0/3)	0.0 (0/1)
Missing	31.4 (60/191)		50.0 (17/34)	33.4 (12/36)	47.7 (31/65)	0.0 (0/26)	0.0 (0/19)	0.0 (0/11)
Birth weight in grams (mean±SD)	(3260±537.7)		(3333±463)	(3240±572)	(3179±612)	(3158±568)	(3419±527)	(3235±484.5)
<2500	35.1 (67/968)	<0.001	10.4 (8/77)	9.6 (9/94)	11.1 (42/378)	1.3 (3/228)	1.1 (1/93)	4.1 (4/98)
2500–2999	5.8 (187/3221)		9.3 (34/365)	4.9 (19/391)	11.0 (112/1016)	1.9 (14/746)	0.5 (2/409)	2.0 (6/294)
3000–3499	6.0 (507/8387)		9.7 (125/1284)	4.8 (64/1337)	11.0 (270/2448)	1.3 (19/1507)	1.1 (10/911)	2.1 (19/900)
3500–3999	5.6 (314/5653)		10.1 (102/1009)	3.8 (38/986)	7.6 (150/1984)	0.9 (8/846)	1.0 (5/516)	3.5 (11/312)
≥4000	5.4 (93/1734)		5.1 (19/373)	4.7 (15/319)	7.2 (48/669)	2.0 (4/197)	3.2 (3/95)	4.9 (4/81)
Missing	22.3 (21/94)		29.4 (10/34)	33.3 (5/15)	18.5 (5/27)	14.3 (1/7)	0.0 (0/4)	0.0 (0/7)

\*Parous group included women with second or subsequent vaginal births.

†(Number within episiotomy group/total episiotomy and non-episiotomy).

‡P value of  $\chi^2$  test (not including the missing values).

parous women, the rate of episiotomy was notably lower, and the most frequent indication was 'protection of the perineum'. These findings show that the present clinical practice of episiotomy use in Palestine is not in line with the international guidelines and recommendations, such as the ACOG,<sup>14</sup> the RCOG international guidelines<sup>18</sup> or the WHO recommendations.<sup>20</sup>

Episiotomy rates and their indications varied across the study hospitals, which may reflect differences in the levels of experience and attitudes of the medical staff. However, one hospital (hospital 5) stood out, having a significantly lower rate of episiotomy than the others by almost 60%. This might be the result of long-term efforts to prevent overuse of episiotomy in this hospital.<sup>13</sup> In comparison, the current rate of episiotomy in hospital 5 is considered high when compared with the previous study, which may indeed reflect the need for continuous education and training of birth attendants to maintain low episiotomy rates.

Similarly, wide variations in episiotomy rates exist around the world as an expression of the difference in routine episiotomy use between countries, as well as within countries and among birth attendants with the same level of experience.<sup>6,7</sup> In this study, the overall episiotomy rate was 28.7%, which is considered high at almost twofold above the last reported rate at 13.9% by the Palestinian Central Bureau of Statistics in 2004.<sup>12</sup> These differences could reflect the increasing number of births in Palestine with crowded hospitals and insufficient number of beds available in maternity units. Additionally, the decrease in the number of medical staff compared with the number of births could prompt some birth attendants to try to accelerate the delivery by using episiotomy, regardless of the negative maternal health impact of this procedure.

The rates of episiotomy among primiparous women in different countries ranged from 15.0% in Sweden up to 100% in Guatemala.<sup>6</sup> In Arab countries, the rates of episiotomy in primiparous women were 51.2% in Saudi Arabia,<sup>9</sup> 91% in Jordan<sup>8</sup> and 95% in Qatar.<sup>23</sup> In comparison, the rate of episiotomy among primiparous women in this study was 77.3%, reflecting the routine use of episiotomy by most physicians and midwives, regardless of national<sup>24</sup> and international guidelines.<sup>19</sup> Moreover, a recent study from Palestine concluded that knowledge of the anatomy, types of episiotomy and best methods of episiotomy repair among physicians and midwives was inadequate.<sup>25</sup> Although the rates of episiotomy among women having their first vaginal birth appeared to be lower than those in studies from Qatar and Jordan and more than in Saudi Arabia, this may not be the case. The aforementioned studies may not present the real rates of episiotomy in these countries, as they included only a limited number of births in one or two hospitals. In contrast, the present study included six major maternity hospitals representing 62% of all births taking place in government hospitals in Palestine. Globally, the rates of episiotomy among parous women are reported to be notably lower compared with primiparous women, ranging from 3.4% in Brazil up to

48.0% in Indonesia, while in some Eastern Asian countries, such as in China, they remain very high at 71.4%.<sup>6</sup> Findings of the current study show the rates of episiotomy among parous women are in line with the global rates. The possible reasons for less use of episiotomy among parous women could be more elasticity of the perineum, a shorter active second stage of labour and the fact that parous women are associated with less obstetric complications during vaginal delivery.<sup>5</sup>

There is no general agreement on the indications for episiotomy,<sup>16</sup> and various studies included acute fetal distress, instrumental deliveries, shoulder dystocia, fetal malpresentation, poorly healed OASIS and primiparity as possible indications.<sup>15-17</sup> However, the RCOG, the ACOG and the WHO recommended that episiotomy must be used only on clinical indications. Several variations in episiotomy indications were advocated; the RCOG recommended instrumental deliveries to be the only possible indication,<sup>18</sup> the ACOG stated that episiotomy use depended on clinical judgement of the birth attendants,<sup>14</sup> while the WHO listed that episiotomy in obstetric emergencies, such as fetal distress requiring instrumental vaginal birth, could be a presumed indication for episiotomy.<sup>20</sup>

In Palestine, hospital guidelines and protocols state clearly that episiotomy is to be performed only if indicated, but do not include a list of indications.<sup>24</sup> However, in practice, primiparity is still the most common indication for episiotomy, followed by protecting the perineum, instrumental deliveries, fetal distress and prolonged second stage of labour. This practice is an expression of widespread non-evidence-based episiotomy use among obstetricians in Palestine as they still believe that the routine use of episiotomy among primiparous women can protect them from OASIS, confounded by the lack of clear and agreed indications for episiotomy. Furthermore, doctors in Palestine have no insurance against occupational errors, which may lead them to exercise extreme caution to avoid the risks that may occur during childbirth for fear of legal liability. Additionally, a study from Palestine reported that routine practices, like episiotomy, depend on the style and experience of the head obstetrician rather than the updated guidelines.<sup>11</sup>

Conflicting results on the relationship between maternal age and episiotomy are found in previous research; one study reported that the rate of episiotomy increased above 35 years of age.<sup>16</sup> However, another study did not confirm this trend,<sup>5</sup> as it used elasticity and non-elasticity of the perineum as the criteria to decide for episiotomy rather than age. However, the number of women who were 35 years or older was low in this study, since most obstetricians in Palestine tend to deliver primiparous women above 35 years by caesarean section.<sup>26</sup> An increased neonatal birth weight is usually associated with episiotomy.<sup>20</sup> The results of this study were inconsistent with these findings, confirming the routine use of episiotomy over selective use also in this group.

Numerous reviews and meta-analyses indicated that there is no evidence supporting the benefits of the routine practice of episiotomy,<sup>3</sup> which is adopted by the NICE guidelines.<sup>19</sup> This evidence is not implemented in many countries. Moreover, one study reported that restrictive use of episiotomy did not only decrease the risks for maternal health but was also less costly than its routine use.<sup>27</sup> Palestine is a country with scarce resources, suggesting that it would be wise to reduce overuse of episiotomy and use it only when clinically indicated. The alarming lack of evidence-based practice in this area has to be addressed by education of staff, regular obstetric clinical audits and team feedback to support greater adherence to updated guidelines by the entire obstetrical team. Additionally, educational interventions to reduce the rates of episiotomy in Palestine are mandatory, as they have been effective in one of the study hospitals.<sup>13</sup> Furthermore, this study was the largest birth cohort study in Palestine and included six hospitals from different areas including Gaza and the West Bank, which allows a comprehensive insight into the practice of episiotomy in Palestine and may help health leaders in Palestine to find solutions to enhance practice and reduce unnecessary use of episiotomy. This study is also interesting in the global context, as other areas face similar problems. Moreover, a study to explore the risk factors associated with episiotomy in Palestine is needed.

### Strengths and limitations of the study

The strengths of this study are its large sample size and its use of a comprehensive database that includes detailed information on all pregnancies and births scheduled for vaginal delivery; this allows a comprehensive insight into the practice of episiotomy in Palestine. Furthermore, most deliveries in Palestine take place in the government sector,<sup>12</sup> which makes the study findings representative. Additionally, it is a prospective population-based study, with all women who gave birth vaginally in the study hospitals included, reducing the risk of selection bias.

The limitations of the study include missing data on some variables; the proportion of missing data varied across the study hospitals. Since the missing data were random, it is not believed to affect the outcomes. The data were obtained from six large government hospitals, and those from private hospitals were not included, although the number of deliveries in the private sector is small. Therefore, this study does not allow conclusions on the actual practice of episiotomy in private hospitals. We do not have information on the possible differences in staff qualifications or staff shift patterns in each hospital. However, as all study hospitals are government hospitals, it is justified to assume that no considerable differences exist between them.

### CONCLUSION

The rate of episiotomy is still high in Palestine, as it is routinely done for the majority of women who deliver vaginally for the first time. Non-evidence-based practices related to episiotomy are widespread during birth in Palestine, suggesting that education of birth attendants, adherence to updated guidelines, implementing obstetric clinical audits and interventions are needed to reduce the overuse of episiotomy. Urgent intervention is necessary to curb the trend of the excessive use of episiotomy.

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