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Prevalence and adverse obstetric outcomes of female genital mutilation among women in rural Northern Ghana

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Background: Female genital mutilation (FGM) is commonly practiced in sub-Saharan Africa and results in adverse pregnancy outcomes among affected women. This paper assessed the prevalence and effects of FGM on pregnancy outcomes in a rural Ghanaian setting. **Methods:** We analyzed 9306 delivery records between 2003 and 2013 from the Navrongo War Memorial Hospital. Multivariable logistic regression analyses were used to determine the effects of FGM on pregnancy outcomes such as stillbirth, birth weight, postpartum haemorrhage, caesarean and instrumental delivery. We also assessed differences in the duration of stay in the hospital by FGM status. **Results:** A greater proportion of mothers with FGM (24.7%) were older than 35 years compared with those without FGM (7.6%). FGM declined progressively from 28.4% in 2003 to 0.6% in 2013. Mothers with FGM were nearly twice as likely to have caesarean delivery (adjusted odds ratios = 1.85 with 95%CI [1.72, 1.99]) and stillbirths (1.60 [1.21, 2.11]) compared with those without. Similarly, they had a 4-fold increased risk of post-partum haemorrhage (4.69 [3.74, 5.88]) and more than 2-fold risk lacerations/episiotomy (2.57 [1.86, 3.21]) during delivery. Average duration of stay in the hospital was higher for mothers with FGM from 2003 to 2007. **Conclusions:** Despite significant decline in prevalence of FGM, adverse obstetric outcomes are still high among affected women. Increased public health education of circumcised women on these outcomes would help improve institutional deliveries and heighten awareness and prompt clinical decisions among healthcare workers. Further scale-up of community level interventions are required to completely eliminate FGM.

Introduction

The United Nations Sustainable Development Goal 5.3 has reiterated the need to eliminate all forms of harmful practices against women and children including early marriage and female genital mutilation (FGM).¹ The practice of FGM is a violation of the rights of affected women and can result in adverse health outcomes.^{2–3}

FGM known variously as ‘female circumcision’, ‘female genital mutilation’ or ‘female genital cutting’, involves the removal of all or parts of the female genitalia. The World Health Organization (WHO) recognizes four types of the procedure: ‘Sunna/circumcision’, ‘excision’, ‘infibulation and intermediate’.⁴ Available literature indicates that ‘excision’ and ‘intermediate’ are the common forms of FGM practiced in Ghana.⁵

It is projected that globally 100–400 million women and girls are currently living with FGM. Majority of these women come from Africa, the Middle East and South East Asia.⁶ The practice of FGM was a major setback to achieving the millennium development goals as at 2015 in most of the affected countries in Africa and

Asia^{7,8} due to its significant contribution to adverse maternal and perinatal outcomes. In Ghana, the prevalence of FGM is estimated to be 4% but was as high as 38% in the Upper East Region.⁹

It has been observed from prior literature that the major drawback to efforts at eliminating FGM is due to its strong roots in tradition, culture, religion and other community-specified non-therapeutic reasons.^{2,10,11} In some cultures, peer pressure, marriageability and chastity are factors that help to preserve the practice.^{10,11} Others also believe FGM promotes virginity because the physical barriers associated with it often reduce the chances of women being raped and the decreasing of sexual desire protects some oversexed women from infidelity.^{11,12} Infibulation is said to promote health and fertility, and also claimed to make sexual intercourse more pleasurable for the male.^{12–14}

The pervasive nature of the practice in rural communities poses a great threat to the already limited healthcare delivery. Furthermore, the profound short- and long-term adverse health outcomes encountered by women who have gone through the practice puts a further burden on both clients and the health system.

The immediate adverse health effects encountered during peripartum and perinatal period are of great concern, since they may pose a threat to both mother and child.

Adverse outcomes have been well documented in literature from the World Health Organization (WHO)¹⁵ and other studies.^{2,3} The complications include prolonged labour, obstetric genital lacerations and severe blood loss (especially postpartum haemorrhage) among women with FGM or cutting.¹⁵ FGM has also been linked with obstetric fistula formations, foetal distress, birth asphyxia and stillbirths.^{10,16}

The practice of FGM has been outlawed in many countries including Ghana in 1994^{17–20} and has resulted in the scale up of interventions to eliminate the practice. Despite this, it is still being practiced in isolated communities especially in rural Northern Ghana including the two Kassena-Nankana districts and parts of Bawku Municipality.⁹ Evidence from an earlier study conducted within the study area from 1996 to 2003 indicated the practice was undergoing a major decline, due in part to the prevailing appropriate community-based interventions put in place by the Navrongo Health Research Centre (NHRC) between 1999 and 2005 and other key stakeholders.⁵

Current literature on the burden and associated effects of FGM on obstetric outcomes within the study area is not available. This study presents an update on the prevalence and obstetric outcomes of FGM among women in the Kassena-Nankana districts from 2003 to 2013. In the study by Oduro et al. on the impact of FGM on pregnancy outcomes in the study setting, the delivery outcomes examined were stillbirth, caesarean section and birth weight.⁵ This paper provides additional insights on the effects on perineal lacerations, planned episiotomy, instrumental delivery, post-partum haemorrhage (PPH) and duration of stay in the hospital.

Methods

Study design

This was a retrospective audit of pregnancy and delivery records in the Navrongo War Memorial Hospital (NWMH) from 2003 to 2013.

Study setting

The NWMH is a major referral facility serving over 165 000 people living in the Navrongo Health and Socio-demographic Surveillance Site (NHDSS). The NHDSS coverage area lies within the Guinea Savannah ecological zone in the extreme north-eastern part of Ghana. It occupies an area of about 1675 km² with 90% of the population living in rural communities where the mainstay of the local economy is subsistence farming.

The hospital offers comprehensive obstetric care and receives referrals from 65 functional Community-Based Health Planning and Services (CHPS) facilities, 8 health centres, 3 private clinics and 2 community clinics. Annual antenatal clinic attendance and deliveries are 2500 and 1500, respectively.²¹ Current unpublished data from the NHDSS shows a crude birth rate of 10.2 per 1000 person years and a crude death rate was 24.8 per 1000 person years for the same period. Neonatal mortality rate is 9.4 per 1000 live births, while infant and under-five mortality rates are 17.8 and 30.6 per 1000 live births, respectively.

Statistical analysis

We extracted 16 808 de-identified delivery records from 2003 to 2013. A total of 7525 records were excluded from the analyses because they had no data on FGM (exposure), had intrauterine foetal death or were macerated stillbirths. Because participants with missing data differed significantly from those without ([Supplementary table S1](#)), a complete case analysis of 9306 was conducted to avoid biased estimates.

Data was analyzed with the aid of STATA v14.2 software. [Table 1](#) provides details of how relevant variables in this paper were assessed or defined. Categorical data were described as counts and percentages and continuous data as means and standard deviations (\pm SD). Pearson's Chi-Squared test was used to examine differences in characteristics by FGM status. Differences in mean (\pm SD) duration of stay in the hospital following delivery according to FGM status were examined using a two-tailed Student t-test. Multivariable logistic regression analysis was used to determine the association between FGM and obstetric outcomes such as mode of delivery, birth weight,

Table 1 Description of how variables used in the study were either assessed or defined

Variable	Classification	Definition
Female genital mutilation	Exposure	Refers to removal of any part of the female genitalia. Women's FGM status was defined according to the findings at examination of the external genitalia during labour or self-reported by the woman and recorded in the delivery records book
Postpartum haemorrhage	Obstetric outcome	Blood loss estimated by the attending nurse or medical doctor performing a caesarean delivery was recorded as an estimated volume lost in ml. PPH was subsequently defined as blood loss >500 ml for SVD and >1000 ml for caesarean deliveries
Stillbirth	Obstetric outcome	Death or loss of a baby before or during delivery and after 28 weeks of pregnancy
Caesarean delivery	Obstetric outcome	A surgical procedure used to deliver a baby through incisions in the abdomen and uterus
Instrumental delivery	Obstetric outcome	The use of forceps or vacuum to assist in achieving vaginal delivery
Birth weight	Obstetric outcome	Weight of the baby measured by the attending midwife or physician immediately after delivery. This was classified as very low birth weight (<1.5 kg), low birth weight (\geq 1.5 kg but <2.5 kg) and normal birth weight (\geq 2.5 kg)
Laceration	Obstetric outcome	Spontaneous tear in the skin or soft tissues of the perineum during delivery
Episiotomy	Obstetric outcome	A surgical incision of the perineum and the posterior vaginal wall carried out by a midwife or attending physician
Age	Explanatory variable	Self-reported age of woman at the time of delivery. This was subsequently categorized into <20 years (teenage pregnancy), 20–34 years and \geq 35 years (elderly mother)
Parity	Explanatory variable	Parity refers to the number of times a woman has been pregnant regardless of the outcome. This was categorized as: <ul style="list-style-type: none"> • primiparous, if the index delivery was the first pregnancy • multiparous, if a mother had delivered more than one time but less or equal to five times and • grand multiparous as mothers with more than five previous deliveries
Gestational age at delivery	Explanatory variable	Gestational age at delivery was recorded in weeks and was re-categorized as preterm (28–37 week), term pregnancy (38–40 weeks) and post term (>40 weeks)
Employment status	Explanatory variable	A mother was considered employed, if she reported any form of formal or informal job that earns her an income

Notes: PPH, post-partum haemorrhage; SVD, spontaneous vaginal delivery.

Table 2 Basic description of maternal and pregnancy outcomes by FGM status in Kassena-Nankana districts from 2003 to 2013

Characteristics	No FGM, n = 7659 (82.3%)	FGM, n = 1647 (17.7%)	All, N = 9306	P-value
Maternal age (years)				
<20	1290 (17.0)	59 (3.6)	1349 (14.6)	<0.001
20–34	5735 (75.4)	1180 (71.7)	6915 (74.7)	
≥35	582 (7.6)	406 (24.7)	988 (10.7)	
Maternal employment status				
Unemployed	3984 (53.6)	1003 (62.0)	4987 (55.1)	<0.001
Employed	3447 (46.4)	616 (38.0)	4063 (44.9)	
Maternal parity				
Primiparous (first pregnancy)	289 (3.8)	20 (1.2)	309 (3.3)	<0.001
Multi-parity (2–5 pregnancies)	4263 (56.1)	1103 (67.7)	5366 (58.2)	
Grand multi-parity (>5 pregnancies)	3045 (40.1)	506 (31.1)	3551 (38.5)	
Gestational age at delivery				
Preterm (28–36 weeks)	4411 (62.7)	908 (58.6)	5319 (62.0)	0.010
Term (37–40 weeks)	2586 (36.8)	634 (40.9)	3220 (37.5)	
Post term (>40 weeks)	35 (0.5)	8 (0.5)	43 (0.5)	
Mode of delivery				
Spontaneous vagina delivery	6314 (83.3)	1348 (82.6)	7662 (83.2)	0.116
Caesarean delivery	907 (12.0)	187 (11.5)	1094 (11.8)	
Assisted/Instrument delivery	355 (4.7)	96 (5.9)	451 (5.0)	
Delivery outcome				
Live birth	7307 (96.4)	1538 (94.6)	8845 (96.1)	0.001
Stillbirth	271 (3.6)	87 (5.3)	358 (3.9)	
Birth weight				
<1.5 kg	72 (0.9)	23 (1.4)	95 (1.1)	0.202
1.5–2.4 kg	1107 (14.4)	227 (13.8)	1334 (14.3)	
>2.5 kg	6480 (84.6)	1397 (84.8)	7877 (84.6)	
Sex of newborn				
Female	4090 (54.8)	815 (51.9)	4905 (54.3)	0.036
Male	3372 (45.2)	755 (48.1)	4127 (45.7)	
State of perineum				
Intact	6698 (87.5)	1491 (90.5)	8189 (88.0)	<0.001
Laceration	42 (0.5)	28 (1.7)	70 (0.8)	
Episiotomy	919 (12.0)	128 (7.8)	1047 (11.2)	
Blood loss				
Normal	6511 (85.1)	1225 (75.0)	7736 (83.2)	<0.001
PPH	1148 (14.9)	408 (25.0)	1556 (16.8)	

Notes: Values presented as absolute count and percentage (%). FGM, female genital mutilation; PPH, post-partum haemorrhage.

PPH and state of the perineum. Maternal age, gestational age, employment status and parity were adjusted for. Associations are reported as adjusted odds ratios (AOR) with corresponding 95% confidence interval (CI) and two-tailed $P < 0.05$ is considered statistically significant.

Ethical consideration

Ethical clearance was obtained from the Navrongo Health Research Centre's Institutional Review Board (NHRCIRB). Though informed consent was waived since secondary data was used, patient records were anonymized to maintain privacy and confidentiality.

Results

Background characteristics

The background characteristics of the 9306 study participants according to FGM status are presented in Table 2. A greater proportion of mothers who had undergone FGM were ≥35 years compared with mothers without FGM (24.7% vs. 7.6%). More mothers without FGM (46.4%) were employed than mothers with FGM (38%). There was a difference in birth weight by FGM status ($P = 0.202$). A greater proportion of mothers with FGM had undergone instrumental delivery compared with those without (5.9% vs. 4.7%). Similarly, mothers with FGM mothers had more stillbirths (5.3% vs. 3.6%) and PPH (25% vs. 14.9%) compared with mothers without FGM.

Prevalence of FGM

Figure 1 represents the prevalence of FGM from 2003 to 2013. The overall FGM rate for the entire study period was 17.7%. The results show a decline in the prevalence of FGM among mothers from 28.4% in 2003 to 0.6% in 2013. There was an initial increase in FGM cases from 28.4% in 2003 to 31.3% in 2004. We then observed a rapid decline to 16.0% in 2005 and a further decline to 13.35% in 2006. We however, noticed an unexpected marginal increase to 13.8% in 2007. From 2008 to 2013, however, there was a continuous decline from 5.7% to 0.6% by the year 2013.

Association between FGM and pregnancy outcomes

Summarized in Figure 2 are adjusted associations of FGM with selected pregnancy outcomes. Factors that were adjusted for included maternal age, employment status, parity and gestational age at the time of delivery. The pregnancy outcomes examined included stillbirths, perineal laceration or episiotomy, LBW and PPH.

Mothers who had practiced FGM were 85% more likely to undergo a caesarean or instrumental delivery compared with those who had not practiced FGM (AOR = 1.85 [1.72, 1.99]; $P = 0.045$). This model explained 17.9% of the observation in the study population. Similarly, mothers who had undergone FGM were 60% more likely to have a stillbirth compared with mothers who had not practiced FGM (AOR = 1.60 [1.21, 2.11]; $P = 0.001$). This model explained 10.7% of the variance in the study subjects. The model examining the association between FGM and birth weight explains 36.3% of the variance among pregnant women. Mothers with FGM had

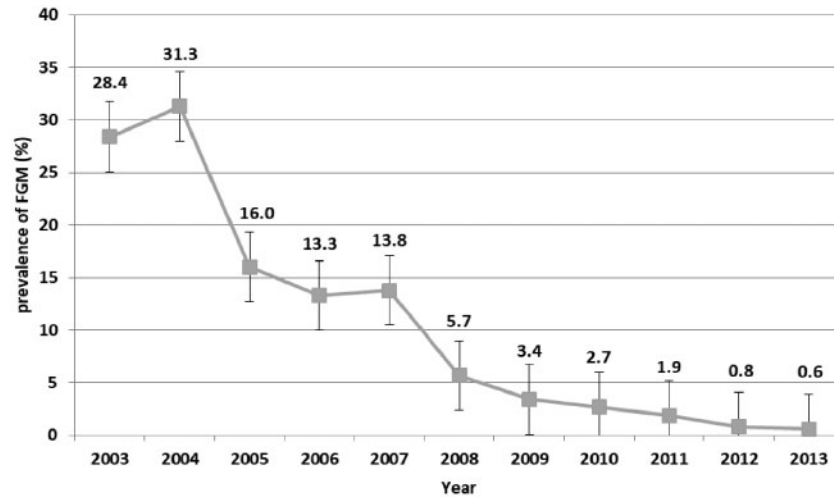


Figure 1 Prevalence and 95% confidence interval of FGM from 2003 to 2013 in Kassena-Nankana districts. FGM, female genital mutilation

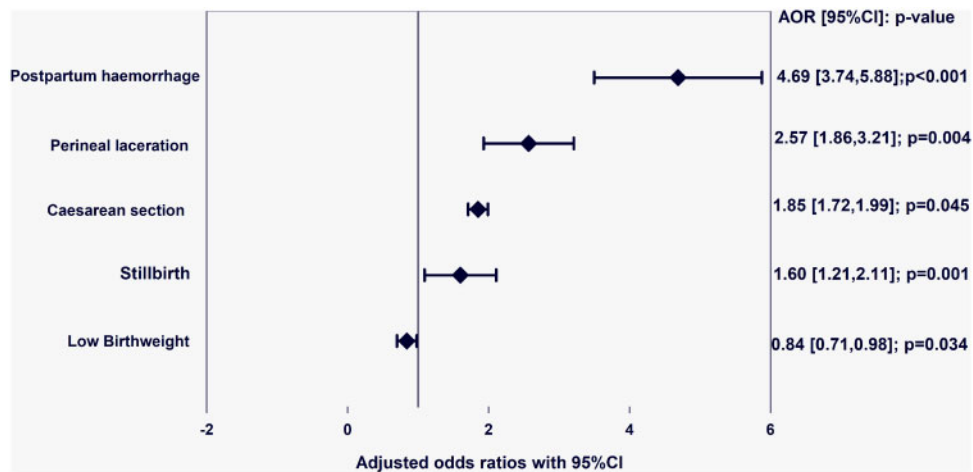


Figure 2 Association of female genital mutilation with selected obstetric outcomes (postpartum haemorrhage, perineal lacerations, caesarean section, stillbirth and birth weight). AOR, adjusted odds ratios; CI, confidence interval

significant 20% lower odds of having a LBW babies compared with non FGM mothers (AOR = 0.84 [0.71, 0.98], $P=0.034$).

Mothers with FGM had 4-fold increased odds of experiencing a perineal laceration or planned episiotomy than mothers without FGM (AOR = 4.69 [3.74, 5.88], $P<0.001$). The variance explained by this model was 49.9% while the model examining the occurrence of haemorrhage was 40.7%. In the latter model, mothers who had undergone FGM were more than twice as likely to have PPH (AOR = 2.57 [1.86, 3.21]; $P=0.004$) compared with mothers without.

Duration of stay in the hospital

The average duration of stay in the hospital per year is presented in as Supplementary material (see [Supplementary table S2](#) and [Supplementary figure S1](#)).

The average duration of hospitalization following delivery differed between FGM and non-FGM mothers in 2003 ($P=0.004$), 2004 ($P=0.016$), 2005 ($P=0.045$), 2006 ($P=0.009$) and 2007 ($P=0.023$). In 2003, the average hospitalization was 4 ± 2 days for FGM and $2 \text{ days} \pm 1$ day for non FGM mothers. This dropped to $2 \text{ days} \pm 1$ day vs. 1 ± 0.8 day for FGM and non FGM, respectively. The average duration of stay in hospital following delivery was $2 \text{ days} \pm 1$ day for both FGM and non FGM mothers from 2008 to 2010. This further declined to 1 day from 2011 to 2013 with no observed differences according to FGM status.

Discussion

In this paper, we examined the prevalence of FGM and its associated pregnancy outcomes using data from the Navrongo War Memorial Hospital (NWMH) from 2003 to 2013. Our results suggest a decline in the prevalence of FGM over the 11 year period (28.4% in 2003–0.6% in 2013). We also found that mothers who have undergone FGM were more likely to experience obstetric and neonatal complications compared with non FGM mothers. From 2003 to 2007, mothers with FGM were more likely to spend longer days in hospital after delivery than mothers without FGM.

Earlier studies in the Kassena-Nankana area have shown very high prevalence of FGM. Mbacke et al 1998 who assessed FGM prevalence using a variety of surveys including demographic panel surveys, survey of pregnant women and school-based surveys found a prevalence rate of 77.1% in the Kassena-Nankana area.²² A previous study within the study setting showed a decline in the prevalence of FGM from 35.2% in 1996 to 21.1% in 2003.⁵ Our study reveals a much lower prevalence rate of 0.6% by the year 2013. The prevalence recorded in our study setting is far lower than the national prevalence of 4%.⁹ While this is commendable, the situation in other parts of northern Ghana and sub-Saharan African countries still look gloomy.^{23,24} For instance a cross-sectional study conducted among women in the reproductive age group in the Bawku Municipality and Pusiga district showed a self-reported prevalence

of 61%.⁹ A qualitative study in the same settings confirmed the continuation of the practice despite the existence of the law.²⁵ A study conducted in the south eastern part of Nigeria in 2018 shows that there is still a high prevalence of FGM in the study area.²⁴ Also in Sudan, FGM prevalence is still up to 20%,²³ a study in Ethiopia which used awareness of FGM as a proxy for prevalence found that 38.5% of interviewees knew of the FGM practice in the study district.²⁶

The decline in FGM prevalence in our study setting may be due to a number of interventions implemented to stop FGM practice in Ghana. First of all, the Government of Ghana outlawed FGM in the country through an amendment of the criminal code in the year 1994 and later the domestic violence Act of 2003.^{17,27} The law particularly seeks to sentence any circumciser and other perpetrators up to 3 years imprisonment.²⁸ This could have served as a deterrent from practicing FGM, therefore, contributing to the reduction in the number of circumcised women and girls yearly. Although some researchers found this legislations to be ineffective in eliminating the practice,¹⁹ it provided an enabling environment for civil society organizations, human rights and gender activist to begin to engage with indigenous communities and offer educational campaigns.

In the case of the Kassena-Nankana districts, a five-year community appropriate intervention implemented by the Navrongo Health Research Centre aimed at eradicating FGM in the Kassena-Nankana Municipality and Kassena-Nankana District of Northern Ghana may have had a direct impact. This project achieved over 90% impact in reducing the practice of FGM in the districts.²⁹ The long-term impact of this intervention in the two districts is now being felt as that can be seen in the decline of the practice over the years. Further evidence of this is the persistently high burden of FGM in neighbouring districts where the intervention was not implemented.⁹ The Ministry of Health and the Ghana Health Service through CHPS and Community mobilization services played key roles in the successful implementation and sustenance of these interventions programmes.³⁰ Further community appropriate interventions such as context specific education on the harmful effects of FGM is therefore very relevant to help eradicate the practice from isolated communities.

Similar to other studies,⁵ our results show that FGM was common among older pregnant women than younger ones. This reflects a decrease in overall incidence as these older mothers may represent old cases prior to the introduction of interventions aimed at curbing FGM. This further presents a good window of opportunity to intensify educational campaigns on the harmful effects of the practice and the law prohibiting it among younger girls to dissuade them from undergoing FGM.

Mothers who had undergone FGM were significantly more likely to suffer adverse obstetric outcomes such as increased risk of PPH, spontaneous perinatal tears, caesarean or instrumental delivery and stillbirth. Previous studies had documented the association between FGM and adverse reproductive health outcomes such as postpartum haemorrhage, stillbirth, early neonatal death, low birth weight, episiotomy, persistent pain during intercourse and postcoital bleeding.^{15,31} For instance, a study conducted in a maternity hospital in Sudan showed a strong association between FGM and obstetric complications such as planned episiotomies to aid in delivery.³² These findings suggest that effective health campaigns to eradicate this practice could help to curb reproductive health complications among pregnant women in the country. Although, our finding shows that FGM was associated with a 4-fold increase in the risk of PPH, a study in Sudan did not observe any association between FGM and obstetric haemorrhage.³² We can attribute this to the high incidence of performing episiotomy wound to prevent laceration and non-linear tear during labour. While in our study, the opposite of a high incidence of spontaneous lacerations compared with planned episiotomies was observed.

We observed that FGM mothers had higher stillbirths compared with non-FGM mothers. Furthermore, mothers who had undergone FGM were more likely to undergo a caesarean or instrumental

delivery compared with those who had not practiced FGM. These observations are similar to a study from south east Nigeria which showed majority of the women with FGM in labour had delayed labour resulting in assisted delivery and subsequent abnormal APGAR score or stillbirths.²³ FGM results in scaring of the perineum and the vagina tissues which can lead to obstructed labour or prolonged second stage of labour. This could explain the observed higher risk of stillbirths, PPH, C-section and perineal tears or episiotomy.

Similar to other studies, the length of stay in hospital was observed to be higher for FGM mothers from 2003 to 2007.^{2,3,10} This could basically be due to the fact that more FGM mothers were likely to undergo caesarean deliveries and may therefore require longer in-patient care. It is interesting to note that post 2007, there was no significant difference in the length of stay at the hospital for both FGM and non-FGM mothers in the study area. This could be attributed to the tremendous transformation in healthcare delivery since the introduction of the CHPS concept^{30,33,34} which has led to improved reproductive healthcare services as antenatal, delivery, postnatal and child welfare and immunization services at the community level over the past two decades. While FGM still pose a threat to women sexual reproductive health in sub-Saharan Africa, primary healthcare strengthening efforts seems to alleviate the effect FGM on health outcomes. However, the practice is still a health risk as corroborated by our findings.

Strengths and limitation

Our study presents current updates on the prevalence and associated obstetric complications of FGM in a highly endemic area that has seen the implementation of community-appropriate interventions. The paper makes a strong case for further scale-up of community appropriate interventions. Our paper has a few limitations we like to highlight. A substantial number of deliveries occur at home and other facilities and therefore limits the generalizability of our findings. Due to the retrospective, potential confounders which were not recorded could not be included in the models. This also limited our ability to conduct further sub-analyses.

Conclusions

Despite the significant decline in prevalence of FGM in the Kassena-Nankana districts of rural Northern Ghana, adverse obstetric outcomes are still high among affected women. Public health education on need for institutional deliveries and heighten awareness among healthcare workers to aid in prompt clinical decisions is imperative. Further scale-up of community interventions will help eliminate FGM.

Supplementary data

Supplementary data are available at *EURPUB* online.

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Conflicts of interest: None declared.

Key points

- The prevalence of FGM is declining in this rural part of Northern Ghana.
- Affected mothers, however, have a higher risk of experiencing adverse obstetric and perinatal outcomes.
- Common adverse outcomes include stillbirth, laceration/episiotomy, caesarean delivery or instrumental manipulation and PPH.
- Advocacy for heightened awareness of the occurrence of these outcomes among affected women will help effective prevention and management.
- Further scale up interventions are needed to completely eradicate the practice of FGM in affected areas.

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