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Female Genital Mutilation and Obstetric Outcomes in the Far-North Region, Cameroon: A Case - Control Study

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Authors' contributions

This work was carried out in collaboration among all authors. Authors GEHE and NMNG designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors LTM and AMM managed the analyses of the study. Author REM managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Various forms of Female Genital Mutilations (FGMs) have been performed for several years and continue to be practiced with serious consequences.
Aims: The study aimed at assessing the socio-demographic profile, prevalence, types of FGM, and associated obstetric outcomes in the Far North Region, Cameroon.
Study Design: Case-control study.
Place and Duration of Study: Four health facilities in the aforementioned region from 4th February, 2017 to 28th April 2017.

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Methods: We included 213 parturients matched for age and parity in a proportion of 1:2 (71 with FGM and 142 counterparts). Data was collected on their socio-demographic characteristics, knowledge of FGM and obstetric outcomes. Each parturient's labor was monitored using a partograph and intermittent fetal heart rate auscultation. The mother-neonate dyads were followed up until discharge from the hospital. Data were analyzed using Epi Info™ version 7.
Results: The mean age of parturients was 23.8 years (SD: 5.8 years). The prevalence of FGM was 28.7%. Most participants had FGM before the age of ten for the following reasons: cultural, marital, social acceptability and suppression of sexual desires. Female genital mutilation was significantly associated with Caesarian section (RR:2.91; 95% CI: 1.43-5.93; p=0.002), episiotomy (RR 8.0: 95% CI 1.56-17.26) P=0.03), perineal tears (RR: 3.67; 95% CI: 1.93-6.98; p<0.001), prolonged labor (RR:2.7; 95% CI 1.44-5.09; p<0.001), and neonatal resuscitation (RR:.44; 95% CI: 1.59-12.18; p=0.002). However, only perineal tears (Adjusted RR:5.58; 95% CI: 2.49-12.53; p<0.001) and episiotomy (Adjusted RR 11.52; 95% CI: 1.16-114.69; p= 0.03) were independently associated with FGM on multivariate analysis.
Conclusion: The prevalence of FGM was high. FGMs were associated with maternal and fetal morbidity. Therefore, mass sensitization on the consequences of FGM, utilization of ANC services and health facility child births should be encouraged.

Keywords: Female genital mutilation; prevalence; obstetric outcomes; Cameroon.

ABBREVIATIONS

ANC: Antenatal care, BBA: Born Before Arrival, CI: Confidence Interval, DHS - Demographic and Health Survey, FGM: Female genital mutilation, FNR: Far-North Region, Hr – Hour, IUGR: Intrauterine growth Restriction, MGF: Mutilation Génitale Féminine, Mins: Minutes, RR: Risk Ratio, SDG: Sustainable Development Goals, UN: United Nations, WHO: World Health Organization.

1. INTRODUCTION

Female genital mutilations (FGM) are procedures that involve partial or total removal of the external genital organs or other injury to the female genital organs for non-medical reasons [1]. It is recognized internationally as a violation of the human rights of girls and women, and constitutes an extreme form of discrimination against women due to its health consequences [2]. There are four types of FGM based on the WHO classification [1,3].

FGM which began decades ago has been on the decline over the years. However, the practice still persists in low-income countries like Cameroon with a prevalence of 1% [3] and 78.5% in Ethiopia [4].The most common reasons for FGM being the respect for tradition and religious obligations, better hygiene, prevention of certain diseases or infertility, the preservation of virginity and improvement of the chances of getting married [4]. Maternal and fetal complications associated with FGM include caesarean section, postpartum hemorrhage, prolonged maternal hospitalization with an increase in the incidence of neonatal resuscitation and perinatal death.

Depending on its severity, FGM poses complex socio-cultural and serious sexual and reproductive health risks for girls and women [5, 6]. Though the consequences of this practice have been documented by some studies [1-6], there is a paucity of data on the obstetric outcomes of FGM in Cameroon. This study aimed at determining the prevalence, evaluating the level of awareness, types and obstetric outcomes of FGM in the Far North Region, Cameroon.

2. METHODOLOGY

2.1 Study Design and Study Setting

This was a case-control study carried out in four hospitals of the Far-North region of Cameroon in the Logone and Chari health area. Logone and Chari is a Department of the Far-North Region in Cameroon. The Department covers an area of 12,133 km² with a population of 486,997 and its Capital is Kousseri [6,7]. The following health facilities were selected for the study: Kousseri Regional hospital, Goulfey District Hospital, Mada District Hospital and Makary District Hospital. These hospitals were selected because of their high maternal delivery rates as compared to others in the region These hospitals had equipped maternities, a medical doctor, 3-8 midwives and nurses, who attended to women of all social classes.

2.2 Sample Size Calculation, Study Population

The sample size was calculated using the formula for comparing proportions [8]. Since there was no study in Cameroon which had documented the proportions of maternal or fetal complications in parturients with FGM, the following assumption was made; 50% of cases (PI) and 25% of controls (P2) were likely to have adverse obstetrical outcomes.

$$n-(\frac{r+1}{r})\frac{(\bar{p})(1-\bar{p})(Z_{\beta}+Z_{\alpha/2})^2}{(p_1 \quad p_2)^2}$$

n= Sample size =ratio of controls to cases (2 in this study), Zβ= Represents the desired power (typically 0.84 for 80% power), $(\bar{p})(1-\bar{p})$ = a measure of variability (similar to standard deviation), For 0.05 significance level, Zα=1.96, P1-P2= Effect Size (the difference in proportions) p1: proportion of exposed in case group, p2: proportion of exposed in control group. $\bar{p}$ = (P1 + P2)/2.

Inserting the above-mentioned values into the equation, the calculated sample size was 60. However, a ratio of 1:2 was used to increase the validity of the study (71 parturients with FGM (cases) and 142 without FGM (controls) matched for age (±2 years) and parity (primiparous, multiparous and grand multiparous).

2.3 Enrollment of Participants and Data Collection

During the study period, all parturients in the four maternity units were approached. Information on the procedure of the study and it's importance was clearly explained to each parturient eligible for enrollment in the language they best understood (mainly French). A written or thumbprint consent of those who accepted to participate in the study was obtained. For those less than 21 years, assent was obtained from their guardian or parent.

The participants were examined by an experienced midwife (research assistant) and the principal investigator for FGM and categorized in two groups after matching for age and parity: those with FGM (cases) and a reference population (controls) without FGM. Using a pre-tested interviewer administered questionnaire, which was a modification of that of WHO questionnaire for assessing female genital mutilation [1], data were obtained on socio-demographic characteristics (age, marital status, level of education,), maternal outcomes (mode of childbirths, prolonged labor, perineal tears, episiotomy, extended maternal hospital stay, maternal deaths) and fetal outcomes (infant resuscitation, birth weight, still birth and early neonatal death). The participant's labor was monitored using the partograph and periodic fetal heart rate auscultation with a Pinard stethoscope. Child birth was carried out with respect to the standard practice in each of the centers and the mother-neonate dyads were followed up until discharge (3 days postpartum) from the hospital.

Parturients with other pregnancy related complications like; recurrent abortions, premature rupture of membranes, third trimester bleeding, IUGR (intrauterine growth restriction), elective caesarian sections, breech presentation, multiple pregnancies were excluded from the study.

The proportion of parturients with FGM was determined by the number of parturients with FGM divided by the number of parturients in the selected health facilities during the study period.

2.4 Data Analysis

The prevalence of FGM was determined by dividing the number of pregnant women who gave birth with FGM by the total number of women who delivered during study period multiplied by100.The types of FGM in the FNR, was determined by examining the participants and the type FGM classified according to WHO [1]. The outcomes of pregnancy were compared between the cases and the (controls) and the frequency and percentages of each variables calculated. For categorical variables Chi square test was used to test for associations between the various adverse delivery outcome and FGM. The risk ratio (RR) were then calculated to measure the strength of the association in cases and controls. Significant associations using a 95% confidence interval and a p-value <0.05 where modelled into a multiple logistic regression to determine the delivery outcomes that were independently associated with FGM.

3. RESULTS

A total of 247 participants were approached for enrollment into the study from the four health facilities during the study period. Thirty-four parturients withdrew from the study after the initial evaluation because they were not comfortable with the study procedures. Two hundred and thirteen participants were thus matched for age and parity; 71 (cases) and 142 (controls). The mean age of the participants was 23.8 years (SD=5.8years). The majority 67 (31.5%) of participants were grand multiparous. Most were Muslims (193) 90.6% and (20) 9.4% were Christians. One hundred and forty-seven (70%) had no formal education and only 2 (0.9%) had a tertiary level of education. About half of the participants 120 (56.3 %) lived in rural areas ranging from 15km to 45km away from the central town Kousseri. One hundred and seven (50%) of participants had attended one to three ANC sessions, 84 (39.4%) had attended four or more sessions; while 22 (10.3%) had not attended ANC prior to delivery. Other socio-demographic characteristics are shown in Table 1.

Table 1. Socio-demographic characteristics of the study population

Characteristics	Frequency (n=213)	Percentage
Age distribution		
15-19	79	37.1%
20-24	36	16.9%
25-29	36	24.9%
30-34	29	13.6%
≥35	16	7.5%
Parity		
0	65	30.5%
1	25	11.7%
2,3,4	56	26,3%
≥5	67	31.5%
Religion		
Christian	20	9.4%
Muslim	193	90.6%
Marital status		
Married	208	97.7%
Single	5	2.4%
Residence		
rural	120	56.3%
urban	93	43.7%
Level of education		
No formal education	147	69.0%
Primary education	47	22.1%
Secondary education	17	8.0%
Tertiary education	2	0.9%
Number of ANC attended		
0	22	10.3%
1-3	107	50.2%
≥4	84	39.4%
Time to travel to the hospital		
<30 mins	146	68.5%
30-59 mins	30	14.1%
60-119 mins	14	6.6%
>119 mins	23	10.8%

Out of a total of 213 participants, 153 (71.8%) had heard of the practice of FGM. However, 60 (28.2%) were not aware of the practice. One hundred and ten (51.6%) parturients did not know who performed FGM while 33.8% (72), 8.9 (19), 5.6% (12) responded that FGMs were performed by traditional circumcisers, both traditional circumcisers and the elderly and only elderly people respectively. Most, (97.2%) FGM were performed before the age of ten. The reasons for performing FGM were; cultural 110 (51.6%), marital desire 16 (7.5%), social acceptability 7 (3.3%) and suppression of sexual desire 6 (2.8%). No participants thought that it was done to safeguard virginity. Seventy-four (34.7%) could not justify the practice as shown in Table 2.

Table 2. Awareness on FGM by the study population

Characteristics	Frequency (n=213)	Percentage
Heard of FGM.		
Yes	153	71.8%
No	60	28.2%
Performers of the procedure		
Do not know	110	51.6
Traditional circumcisers	72	33.8
Traditional circumcisers/old people	19	8.9
Old people	12	5.6
Hospital	0	0
Age at genital mutilation (years)		
<10	69	97.2%
>10	2	2.8%
Reasons for FGM		
Cultural	110	51.6%
Do not know	74	34.7%
Marriage	16	7.5%
Social acceptability	7	3.3%
Suppress sexual desire	6	2.8%
Safeguard virginity	0	0%

Table 3. Comparison of maternal obstetrical outcomes between patients with FGM and their counterparts

Maternal outcome	(cases, N=71)	Control, N= 142)	RR	95% CI	p-value
Caesarian section					
Yes	16 (22.5%)	11 (7.8%)	2.91	1.43-5.93	0.002
No	55 (77.5%	131 (92.3%)			
Episiotomy					
Yes	4 (5.6%)	1 (0.7%)	8.0	1.56-17.26	0.03
No	67 (94.4%)	141 (99.3%)			
Perineal tear					
Yes	22 (31.0%)	12 (8.5%)	3.67	1.93-6.98	<0.001
No	49 (69.0%)	130 (91.6%)			
Prolonged labor					
yes	19 (26.8%)	14 (9.9%)	2.7	1.44-5.09	<0.001
no	52 (73.2%)	128 (90.1%)			
Extended maternal hospital stay					
Yes	1 (1.4%)	4 (2.8%)	0.5	0.06-4.39	0.52
No	70 (98.6%)	138 (97.2%)			
Maternal death					
Yes	1 (1.4%)	2 (1.4%)	1.0	0.09-10.84	1.0
No	70 (98.6%)	140 (98.6)			

Out of the 247 parturients who gave birth during the study period, 71 had genital mutilation, giving a prevalence of 28.7%. Forty-one (57.7%) had type I FGM, 30 (42.3 %) had type II/III FGM, and none had type IV FGM.

The parturients with FGM were 2.9 times more likely to have a caesarian section [(RR 2.91: 95% CI 1.43-5.93) p= 0.002], 2.5 times less likely of having a vaginal delivery [(RR 2.5: 95% CI 1.24-5.05, p=0.008)], 8 times more likely to have an episiotomy [RR 8.0: 95% CI 1.56-17.26), 3.7 times more likely to have a perineal tear (RR 3.67: 95% CI 1.93-6.98) p <0.001], and 2.7 times more likely to have a prolonged labor [(RR 2.7(95% CI 1.44-5.09) P<0.001)] when compared to their counterparts (Table 3).

Neonates of mothers with FGM were 4.4 times at risk of being resuscitated at birth [(RR 4.4: 95% CI 1.59-12.18) p =0.002] than their counterparts. Low birth weight and early neonatal death were not associated with FGM (Table 4).

After bivariate analysis, the following factors were found to be obstetric outcomes associated to FGM: caesarian section (RR 2.91: 95% CI 1.43-5.93, p=0.002), perineal tear (RR 3.67: 95% CI 1.93-6.98, p<0.001), episiotomy [RR 8.0: 95% CI 1.56-17.26) P=0.03, prolonged labor (RR 2.7: 95% CI 1.44-5.09, P<0.001). Neonatal resuscitation (RR 4.4: 95% CI 1.59-12.18, p=0.002). After modeling these factors into a multivariate logistic regression analysis, only perineal tears (adjusted RR 5.58: 95% CI 2.49-12.53, p<0.001) and episiotomy (adjusted RR11.52: 95% CI 1.16-114.69, p= 0.03) were independently associated with female genital mutilation as shown in Table 5.

Table 4. Comparison of fetal outcomes between parturients with FGM and their counterparts

Fetal outcome	Cases, N= 71	Controls, N=142	RR	95% CI	P-value
Neonatal resuscitation					
Yes	11 (15.5%)	5 (3.5%)	4.4	1.59-12.18	0.002
No	60 (84.5%)	137 (96.5%)			
Infant birth weight<2500g					
Yes	6 (8.5%)	21 (14.8%)	0.57	0.24-1.35	0.19
No	65 (91.6%)	121 (85.2%)			
Early neonatal death					
Yes	6 (8.5%)	9 (6.3%)	1.33	0.5-3.6	0.57
No	65 (91.6%)	133 (93.7%)			

Table 5. Multivariate logistic regression analysis of factors associated with FGM

Outcome	Adjusted RR	95% CI	P-Value
Caesarian section			
No	1		
Yes	3.93	0.00-1.20	0.97
Episiotomy			
No	1		
Yes	11.52	1.16-114.69	0.03
Prolonged labor			
No	1		
Yes	1.57	0.52-4.75	0.42
Perineal tear			
No			
Yes	5.58	2.49-12.53	<0.001
Neonatal resuscitation			
No	1		
Yes	2.39	0.59-9.71	0.22

4. DISCUSSION

Despite the efforts of international agencies, governments, and grassroots community advocates to eradicate the practice of FGM, the long term effect of this practice still persist in the life of its victims [4]. Depending on the type of FGM these victims are exposed to complex socio-cultural, sexual and reproductive health risks [5]. Therefore, describing the complications of female genital mutilation in a more specific context like in the far north region, will help in the development of targeted measures to prevent its practice as well as to prevent its complications in the already existing victims. This study therefore aimed at determining the prevalence of FGM, classifying and outlining the various types of FGM practiced, and identifying its effects on pregnancy outcome in the Far-North region of Cameroon.

In this study, The age range of our study participants was between 15 and 40 years, similar to that obtained in Ethiopia [9]. The mean age of the study participants was 23.8 ± 5.8 years. This finding is similar to that obtained in Burkina Faso and Ethiopia who had reported mean ages of 24.0 years and 24.2 ± 4.5 years respectively [5,10]. Our result is slightly lower than the mean age of 30 ± 9.2 years and 26·3 ± years 6·2 in Ethiopia [4] in other African countries [11] respectively. This difference may be explained by the fact that girls in the Far north region of Cameroon get married at a relatively younger age [12,13] . We equally found that nine in ten participants were married. This result tallies with that reported in 2005 [13,14]. More so, more than half (55.8%) of our study participants came from rural areas This can be explained by the fact that three of the four selected health facilities were found in rural area

We found out that one hundred and fifty-three (71.8%) participants had heard of the practice of FGM and that the reasons for such practice were: cultural, marital and social acceptability as well as to suppression of sexual desire. These results are similar to those of other regions of the world; Kenya, Australia, Nigeria [15-18].

In this study, we found that the prevalence of FGM was 28.7%. This result is similar to the 25 % reported in Nigeria [19]. It is however higher than the 1% reported by the Cameroon 2004 demographic and health survey [3]; and the 2-3% reported in Australia in 2016 [17]. Our result is lower than 78.5% reported in Ethiopia [4]; 40% in Ghana, 88% in Nigeria, 79% in Senegal and 82% in Sudan in a survey conducted by WHO [15]. These differences could be explained by the fact that, most of these studies involved a greater sample size and were community based rather than hospital based therefore increasing the chances of identification of FGM victims.

The study revealed, the most common type of FGM practiced was the Type I with a proportion of 19.7%. This result tallies with the 11% of Type I FGM reported by WHO in Ghana [15]. Our result is higher than the 2.5% rate of type I FGM reported in Ethiopia but however lower than 33% reported in Australia [4,17]. This can be explained by differences in socio- cultural features between these countries.

In this study, the adverse maternal obstetric outcomes associated with FGM were: increased risk of cesarean section, episiotomy, prolonged labor, perineal tears. Several studies have revealed similar adverse outcomes in these FGM victims [15, 20-25]. This may be explained by the fact that following FGM, the scar tissue which is less elastic than the normal perineal and vaginal tissue might cause differing degrees of obstruction leading to tears or episiotomy. We equally found during our study that FGM was associated with adverse neonatal outcomes such as increased risk of neonatal resuscitation as in other studies [26]. This could be explained by the possibility of fetal asphyxia due to obstructed labor. However, following a multivariate analysis only perineal tear and episiotomy were found to be independently associated with FGM.

5. CONCLUSION

The prevalence of FGM amongst women who gave birth in health facilities in the FNR was high 28.7%. The commonest type of FGM was type I while type III was the least practiced. The reasons for carrying out FGM were; cultural, marital, social acceptability, and to suppress sexual desires. Increased maternal, and perinatal morbidity and mortality were associated with FGM. Therefore, mass sensitization on the consequences of FGM, utilization of ANC services and health facility child births should be encouraged.

6. STUDY LIMITATIONS

Though some Non-Governmental Organizations (NGO) in the FNR encourage women in remote areas to give birth in health institutions by offering gifts after delivery, only 40% of women deliver in health facilities according to local health authorities, and the remaining 60% deliver

at home with the help of traditional birth attendants. This reduced the number of cases seen, and the result may not be the exact reflection of what happens in the community of the FNR. That notwithstanding, the findings reflect the situation of what obtains in the community as high-volume centers which provide obstetric care in this region were selected for the study.

Some women were discharged against medical advice after about an hour after delivery for both cultural and financial reasons. This hindered thorough postpartum follow up during the first 72 hours. Furthermore, some participants while answering the questionnaire, even after consent, denied the fact that they were cut or had heard of the practice meanwhile on physical examination, they had evidence of female genital mutilation. This was probably due to the fact that they were ashamed or they were trying to protect those who did the procedure since it is now punishable by the Cameroonian law.[27]. The number of participants that were not properly classified as cases or control was negligible because a thorough genital examination was performed by the principal investigator to avoid the confusion between well healed genital scars and participants without FGM. Only early obstetric outcomes could be assessed because of the short duration of hospital stay of the mothers and their neonates, so the effect of FGM on long-term obstetric outcomes such as postpartum infections, fistulae, and later neonatal and infant mortality, could not be evaluated.

CONSENT

All participants consented to participate in the study.

ETHICAL CONSIDERATIONS

The protocol was approved by the research panel of the Faculty of Health Sciences and Ethical clearance was sought from the Institutional Review Board of the Faculty of Health Sciences, University of Buea (N^0 2017/003-555-04 /SG/IRB/FHS) of 12/04/2017. Administrative authorization was obtained from the Regional Delegation of Public health for the Far Nord Region, and the Directors of the various health facilities involved in the study. All participants consented to participate in the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Who Guidelines on the Management of Health Complications from Female Genital Mutilation. Geneva. World Health Organization; 2016.
   Available:http://www.ncbi.nlm.nih.gov/books/NBK368483/
   [Accessed 7 December 2016]
2. FGMC_2016_brochure_final_UNICEF_SPREAD.pdf,
   Available:https://www.unicef. org/media/files/FGMC_2016_brochure_final_UNICEF_SPREAD.pdf
   [Accessed 15 May 2017]
3. En-fgm-countries-cameroon - en-fgm-countries-cameroon.pdf,
   Available:http://www.cameroon-today.com/support-files/en-fgm-countries-cameroon.pdf
   [Accessed 16 May 2017]
4. Bogale D, Markos D, Kaso M. Prevalence of female genital mutilation and its effect on women's health in Bale zone, Ethiopia. A cross-sectional study. BMC Public Health; 14. Epub Ahead of Print; 2014. DOI: 10.1186/1471-2458-14-1076.
5. Ndiaye P, Diongue M, Faye A, et al. Female genital mutilation and complications in childbirth in the province of Gourma (Burkina Faso). Sante Publique Vandoeuvre--Nancy Fr. 2010;22:563–570.
6. Far North Region (Cameroon). Wikipedia; 2016.
   Available:https://en.wikipedia.org/w/index.php?title=Far_North_Region_(Cameroon)&oldid=749181775
   [Accessed 20 December 2016]
7. Logone-et-Chari. Wikipedia; 2015.
   Available:https://en.wikipedia.org/w/index.php?title=Logone-et-Chari&oldid=654935247,
   [Accessed 16 May 2017]
8. Charan J, Biswas T. How to Calculate Sample Size for Different Study Designs in Medical Research? Indian J Psychol Med. 2013;35:121–126.
9. Interagency_Statement_on_Eliminating_FGM.pdf,
   Available:http://www.un.org/ womenwatch/daw/csw/csw52/statements_missions/Interagency_Statement_on_Eliminating_FGM.pdf
   [Accessed 22 May 2017]

10. Towedros G. Female Genital Mutilation and Birth Complications, Jijiga town, eastern Ethiopia. Full Thesis Document. Tewodros Gebremichael; 2002. Available:pdfhttp://etd.aau.edu.et/bitstream/123456789/8470/1/Tewodros%20Gebremichael.pdf
[Accessed 2 Dec 2017]
11. FGM-obstetric-study-en.pdf, Available:http://www.who.int/reproductivehealth/publications/fgm/fgm-obstetric-study-en.pdf
[Accessed 20 May 2017]
12. Tsafack M, Simo KR. Planification familiale05chapitre05.pdf Available:http://dhsprogram.com/pubs/pdf/FR163/05chapitre05.pdf
[Accessed 20 May 2017]
13. Tebeu PM, Kemfang JD, Sandjong DI, et al. Geographic Distribution of Childbirth among Adolescents in Cameroon from 2003 to 2005. Obstet Gynecol Int; 2010. Article ID: 805165.
14. Tebeu PMT, Dupont J, Halle Ekane G, et al. [Impact of young maternal age on delivery outcome at the Provincial Hospital in Maroua, Cameroon from 2003 to 2005]. Med Trop Rev Corps Sante Colon. 2008; 68:553–554.
15. WHO study group on female genital mutilation and obstetric outcome. Female genital mutilation and obstetric outcome: WHO collaborative prospective study in six African countries. The Lancet. 2006;367: 1835–1841.
16. Effect_of_fgm_on_childbirth_africa.pdf, Available:http://www.who.int/reproductivehealth/publications/fgm/effect_of_fgm_on_childbirth_africa.pdf?ua=1
[Accessed 16 May 2017]
17. Varol N, Dawson A, Turkmani S, et al. Obstetric outcomes for women with female genital mutilation at an Australian hospital, 2006–2012. A descriptive study. BMC Pregnancy Childbirth. 2016;16:328.
18. Mandara MU. Female genital mutilation in Nigeria. Int J Gynaecol Obstet Off Organ Int Fed Gynaecol Obstet. 2004;84: 291–298.
19. Yoder PS, Abderrahim N, Zhuzhuni A. Female genital cutting in the demographic and health surveys. A critical and comparative analysis; 2004. Available:http://www.dhsprogram.com/publications/publication-CR7-Comparative-Reports.cfm
[Accessed 22 May 2017]
20. Kaplan A, Forbes M, Bonhoure I, et al. Female genital mutilation/cutting in The Gambia: long-term health consequences and complications during delivery and for the newborn. Int J Womens Health. 2013; 5:323–331.
21. Chibber R, El-saleh E, harmi JE. Female circumcision: Obstetrical and psychological sequelae continues unabated in the 21st century. J Matern Fetal Neonatal Med. 2011;24:833–836.
22. Johnson EB, Reed SD, Hitti J, et al. Increased risk of adverse pregnancy outcome among Somali immigrants in Washington state. Am J Obstet Gynecol. 2005;193:475–482.
23. Elnashar A, Abdelhady R. The impact of female genital cutting on health of newly married women. Int J Gynecol Obstet. 2007;97:238–244.
24. Berg RC, Underland V. The obstetric consequences of female genital mutilation/cutting. A systematic review and meta-analysis. Obstet Gynecol Int; 2013. Article ID: 496564.
25. Meirik O, Banks E, Farley T, et al. Female Genital Mutilation and Obstetric Outcomes: Flawed Systematic Review and Meta-Analysis Does Not Accurately Reflect the Available Evidence. Obstet Gynecol Int; 2014.
[Epub ahead of print 20 March 2014]
DOI: 10.1155/2014/205230
26. Larsen U, Okonofua FE. Female circumcision and obstetric complications. Int J Gynecol Obstet. 2002;77:255–265.
27. Law No. 2016/007 of July 12; 2016. Relating to the Penal Code - cm014en.pdf, Available:http://www.wipo.int/edocs/lexdocs/laws/en/cm/cm014en.pdf
[Accessed 18 May 2017]

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