



Network Against Gender
Based Violence

act:onaid



Obstetric Outcome of Female Genital Mutilation

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A Report written for the Network against Gender Based Violence and ActionAid The Gambia



Funded by **AMPLIFYCHANGE**

LIST OF ABBREVIATIONS

FGM	-	Female genital mutilation
FGM/C	-	Female genital mutilation or cutting
HIV	-	Human immunodeficiency virus
LBW	-	Low birth weight
WHO	-	World Health Organization

EXECUTIVE SUMMARY

The practice of female genital mutilation or cutting (FGM/C) is rampant in sub-Saharan Africa. An estimated 200 million women and girls worldwide have been subjected to this practice, the majority living in Africa. The prevalence rate of FGM/C among women in the reproductive age group is 76.3%. The practice is usually done for cultural or religious beliefs but it is usually marred with many complications such as bleeding leading to shock, transmission of infection, injuries to adjacent organs, dyspareunia, anorgasmia, paraclitoral cyst and chronic pain. It also poses obstetric risks such as prolonged labour, increased caesarean section rates, increased rates of episiotomy, perineal tears, postpartum haemorrhage and increased perinatal complications. Consequently FGM/C has been outlawed in many countries including The Gambia. However, it is still widely practiced in the country. There is a need for local evidence on the health consequences of the FGM/C. This is necessary for advocacy and health education purposes.

An observational study to assess the obstetric outcome of parturient (pregnant women in labour) was carried out between May and September 2016. The study was carried out in 4 health facilities: Bansang hospital (Central River Region), Brikama District Hospital (West Coast Region), Jammeh Foundation for Peace Hospital (Kanifing Municipality) and Edward Francis Small Teaching Hospital (Banjul Municipality). Obstetric outcome of interest were: postpartum blood loss, caesarean section rates, perineal tears (including episiotomy), need for neonatal resuscitation, low birth weight and perinatal death.

A total of 1,569 participants were recruited into the study, 23% had no FGM/C while 77% had FGM/C of varying severity. FGM/C in The Gambia was found to be associated with adverse obstetric outcomes. The risk of postpartum haemorrhage was doubled for women with type I FGM/C, tripled in type II FGM/C and increased by 5-fold for those with type III and IV FGM/C. Similarly, the risk of a perineal tear (or episiotomy) was doubled in FGM/C type I and II and tripled for FGM/C type III. Caesarean section risk was tripled for women with any type of FGM/C. FGM/C type I was also associated with a 2-fold increase in risk for neonatal resuscitation, this risk increases to a 4-fold rise in FGM/C type III. Perinatal death was not significantly associated with FGM/C.

This study provides evidence of the harm posed by FGM/C to parturient women in The Gambia. FGM/C has been banned in The Gambia. However, there is fear that the practice can be driven underground. Advocacy and sensitization of Gambians is needed to end this practice. It is hoped that the result of this study will be useful in convincing people to abandon the practice.

BACKGROUND OF THE STUDY

The World Health Organization (WHO) definition of Female Genital Mutilation/Cutting (FGM/C) comprises all procedures involving partial or total removal of the external female genitalia or other injury to the female genital organs for non-medical reasons (1). It is a practice that is deeply rooted in several African Countries as well as some Asian countries. An estimated 200 million women and girls worldwide have been subjected to this practice, the majority living in African countries (2). The practice spans cultural and ethnic groups and occurs among Muslim, Christian and secular communities.

Several reasons are given for the practice of FGM/C. These include: prevention of promiscuity in the female, enhancement of male sexual performance and pleasure, maintenance of cleanliness of the genital area, aesthetic reasons, enhancement of fertility and improving the chances of a woman's marriage opportunity amongst other reasons (3). These reasons are based on cultural and religious beliefs and have no basis in science. However, the practice of FGM/C is fraught with adverse health consequences. Immediate complications include bleeding leading to shock, transmission of infection and injuries to adjacent organs like the urethra and the rectum. The procedure is frequently performed by traditional practitioners who have had no formal medical training, thus increasing the risk of complications (4). Long term sequelae of FGM/C include dyspareunia, anorgasmia, paraclitoral cyst and chronic pain (3). Obstetric risks include prolonged labour, increased caesarean section rates, increased rates of episiotomy, perineal tears and postpartum haemorrhage (3, 4). Women with FGM/C also suffer increased rates of perinatal complications including need for neonatal resuscitation, babies with low birth weight, still birth and early neonatal death^{4,5}.

In part because of these negative health consequences of FGM/C, many governments around the world have outlawed the practice. However, FGM/C is still a deeply rooted traditional practice in many countries particularly in Africa.

The national prevalence rate of FGM/C among women aged 15-49 in the Gambia is 76.3% (5). In 2013, a national action plan was launched in The Gambia with the aim of reducing the practice of FGM/C in the country over the next 4 years. This was based on awareness campaigns around the implementation of the Children's Act 2005 and the Women's Act 2010 as well as the health consequences of FGM/C. An additional strategy of the action plan was to create an evidence base for FGM/C outcomes in the Gambia. As such this study aimed to provide methodologically sound statistics for the Gambia to serve as a basis for future advocacy in the country.

In 2015, Gambia's parliament passed a bill outlawing FGM/C for the first time. But with high rates among the current population it may be many years before the health benefits of this ban are felt.

COUNTRY PROFILE

The Gambia is the smallest country in mainland Africa. It is a narrow strip of land bordered by Senegal on 3 sides and the Atlantic Ocean on the 4th side. The Gambia is located on the West African coast and extends about 400 km inland. The width of the country varies from 24 to 28 kilometres and has a land area of 10,689 square kilometres. The country has a tropical climate characterised by two seasons: rainy season (June – October) and dry season (November-May). The Gambia harbors a wealth of land, coastal, marine and wetland habitats and species of local, national, regional and global significance, making it an attractive tourist destination. Due to its unique geographic location, it is also a hub for trade in the region.

The 2013 census estimated the population to be about 1.9 million, with annual growth rate of 3.1 % (6) . With a population density of 174 persons per square kilometer, it is one of the most densely populated countries in Africa. About 42.1% of the population live in the rural area and women constitute 50.5% of the total population. The crude birth rate is 40.5 per 1000 population while the total fertility rate is 5.6 births per woman (7) The high fertility level has resulted in a very youthful population. Over 40% of the population is below 15 years and 20% between the ages 15 to 24 (6, 7) . Average life expectancy at birth is 63.4 years (7).

The overall literacy rate is around 55%, and is significantly lower for women than for men (8). The main ethnic groups are : Mandinka/Jahanka (34.4%), Fulani/Tukulur/Lorobo (24.1%), Wollof (14.8%), Jola/Karoninka (10.5%), Serahuleh (8.2%), Serere (3.1%), Manjago (1.9%), Bambara (1.3%) and Aku /Creole (0.5%) and others 1.5% (6). The Gambia is a deeply religious country with muslims accounting for 96% of the population (6).

Three quarters of the population depend on agriculture for sustenance. About 25% of children between the ages of 5 and 14 years are estimated to be engaged in child labour (8). The gross domestic product is estimated to be about \$3.4 billion and over 48% of the population is thought to live below the poverty line (8).

The Foundation for Research on Women's Health, Productivity and the Environment (BAFROW) reports that seven of The Gambia's nine ethnic groups practice one of these forms (9). Nearly all Mandinkas, Jolas and Hausas (together 52 percent of the population) practice Type II on girls between 10 years and 15 years of age . The Sarahulis (nine percent of the population) practice Type I on girls one week after birth. The Bambaras (one percent of population) practice Type III, which takes place when girls are between 10 years and 15 years of age. The Fulas (18 percent of the population) engage in a practice analogous to Type III that is described as "vaginal sealing" or Type IV on girls anywhere between one week and 18 years of age.

DEMOGRAPHIC DESCRIPTION OF THE STUDY POPULATION

The study population consisted of parturient women in 3 of The Gambia's 5 regions (Central River Region, West Coast region and Greater Banjul area). Over 70% of The Gambia's population live in these areas (6). Women make up about 51% percent of the Gambian population and 50% of Gambian women are in the reproductive age group (6). Total fertility rate is 5.6 and the crude birth rate is 40.5 (7). Over 86% of pregnant women receive antenatal care from a skilled care provider although skilled providers conduct only 57.2% of deliveries (7). The overall literacy rate is 55% although this is lower for women (8).

OBJECTIVES

The main objective of the study is to determine the obstetric outcome of parturient with FGM/C and those without FGM/C. To achieve this objective we:

1. Determined the association between blood loss and FGM/C (primary objective)
2. Determined the association between caesarean section and FGM/C.
3. Determined the association between FGM/C and perineal injuries including episiotomy amongst parturient women.
4. Determined the association between FGM/C and fetal outcomes such as birth asphyxia, low birth weight and stillbirths.

METHODOLOGY

This is a prospective stratified observational study carried out between May and September 2016. Consenting parturient women in the first stage of labour were included in the study. A minimum of 1178 parturient women (a minimum of 356 in no FGM/C, FGM/C I and FGM/C II and of 110 in FGM/C III or IV) was the calculated sample size. Recruitment was carried out at 4 health facilities across the country: Brikama District Hospital, Jammeh Foundation for Peace Hospital, Bansang Hospital and Edward Francis Small Teaching Hospital.

Four midwives and a medical doctor were employed from each site and trained in obtaining consent, identifying types of FGM/C, assessing blood loss, Apgar score, perineal tear as well as using the questionnaire to gather the relevant data. The midwives were responsible for data collection with supervision from medical doctors and the investigators.

All women who presented in early labour at the 4 participating health facilities were approached and informed of the study. Early labour was defined as women who were in the first stage of labour (before full cervical dilatation). Consenting parturient women who met the eligibility criteria were then examined for the presence or absence of FGM/C. Where FGM/C was present, it was categorized by

the WHO classification of the type of FGM/C present. Structured questionnaire-based interviews were conducted to obtain demographic information as well as relevant medical and obstetric history. The women were followed up through out the course of labour routinely as per the normal protocol in the health facility. Outcome of labour was recorded in the questionnaire.

Post-partum blood loss was measured according to the protocol for measuring blood loss in the WHO multicentre randomized trial of misoprostol in the management of the third stage of labour (10).

The standard of care provided to women and babies was in accordance with normal standards and protocols at the participating health facilities. The Gambian Government Ethics Committee gave approval for the study.

The Study End Points were:

- Post-partum blood loss of greater than 500 ml
- Need for caesarean section
- Rate of episiotomy and perineal tears
- Perinatal death
- Need for resuscitation
- Birth weight <2500g

Inclusion Criteria

- Pregnant women with a singleton foetus in the first stage of labour who consent to be included in the study.

Exclusion Criteria

- Pregnant women booked for elective caesarean section for any reason.
- Women with multiple pregnancy were excluded from the study.
- Women presenting in late stage of labour (second stage) were excluded from the study.
- Failure to give consent.
- Participants below 18 years of age were excluded from the study

Statistical Analysis

Poisson regression was performed to assess the association between FGM and binary outcomes. Linear regression model was performed to assess the association between FGM and continuous outcomes. Data was analysed for test of association using STATA.

SAMPLE SIZE CALCULATION

The sample size calculation was done using postpartum blood loss (binary variable) as main outcome. Kaplan et al. reported a proportion of 66.2% of FGM I, 26.3% of FGM II and 7.5% of FGM III (11). We estimated the proportion of women with no FGM to be about 24%, FGM I (50%), FGM II (20%) and FGM III or IV (6%) in the population.

We assumed that among women with no FGM/C, the proportion of postpartum blood loss would be 6% (12). We expect a risk ratio of 2 for FGM I vs. No FGM and also FGM II vs. No FGM but a risk ratio of 2.5 for FGM III or IV vs. No FGM. The type I error is set at 5% and the power at 80%. We considered a sample size ratio of 1 for comparing FGM I to no FGM and FGM II to no FGM but a ratio of 1/3 for comparing FGM III or IV to no FGM because of the low prevalence of FGM III or IV. For each comparison, the minimum sample size is as follows:

- Comparison of FGM I vs. No FGM: we need 356 no FGM and 356 FGM I.
- Comparison of FGM II vs. No FGM: we need 356 no FGM and 356 FGM II.
- Comparison of FGM III or IV vs. No FGM: we need 333 no FGM and 110 FGM III or IV.

A single model was used to perform the three comparisons above therefore a minimum of 356 parturient with no FGM, 356 with FGM I, 356 with FGM II and 110 with FGM III or IV was the calculated sample size. A total minimum sample size of 1178 parturient women was calculated.

LITERATURE REVIEW

FGM/C is known to be associated with several health consequences. The severity of the health consequence is directly related to the severity of the type of FGM/C. Immediate health risks include severe pain, bleeding, infection, labial fusion as well as psychological consequences. Long-term complications include keloid formations, infections, birth complications, complications in the newborn, sexual difficulties as well as psychological complications.

The genital area is a very rich in nerve endings and cutting these nerve endings (often without any form of anaesthesia) can lead to extreme pain (13-15). Type III FGM/C is a more extensive procedure and takes a longer duration to perform and thus expected to be associated with more pain. The healing process is usually associated with lot of pain and these girls are not routinely provided with very strong painkillers. Chronic pain may result from trapped nerve endings (16).

Excessive bleeding leading to shock and even death have been documented as consequences of the procedure (17, 18). Shock can also be caused by extreme pain. Difficulty in passing urine or faeces may result from severe pain, swelling or oedema (13). Infections may result from the use of non-sterile instruments that may lead to an overwhelming bacterial infection, septic shock and death (18, 19). Dermoid cysts, abscess and genital ulcers can develop leading to loss of superficial tissue (16-18, 20). Chronic pelvic infections may lead to chronic pelvic pain (21). Urinary tract infections can ascend to the kidneys, potentially resulting in renal failure, septicaemia and death. An increased risk for repeated urinary tract infections is well documented in both girls and adult women (19, 22). An increased frequency of certain genital infections like bacterial vaginosis has been documented (16, 21, 23). Some studies have documented an increased risk for genital herpes, but no association has been found with other sexually transmitted infections (16, 21, 23). The increased prevalence of herpes in women subjected to female genital mutilation may also increase the risk for

HIV infection, as genital herpes is a risk factor in the transmission of HIV. People who have had FGM/C are also at risk of other infections including tetanus and viral infections like hepatitis and the human immunodeficiency virus (HIV) (21). However, while no direct association between HIV and FGM/C has been reported, one study has documented an indirect association (16, 21, 24). This may be due to the low level of HIV prevalence in the age group of girls who are the victims of FGM/C.

Studies have suggested that due to labial adhesions, some cases of type II may end up as a type III (17, 25, 26). Unsuccessful healing especially in type III may also lead to repeat FGM/C thereby traumatizing the victim all over again (18, 20). Excessive scar formation (keloids) may form at the site of FGM/C (16, 27).

Removal of, or damage to highly sensitive genital tissue, especially the clitoris, may affect sexual sensitivity and lead to sexual problems, such as decreased sexual pleasure and pain during sex. Scar formation, pain and traumatic memories associated with the procedure can also lead to such sexual difficulties (13, 22, 28). Infibulation will need to be opened later in life (defibulation) before any sexual activity can take place. As the infibulation must be opened up either surgically or through penetrative sex, sexual intercourse is frequently painful during the first few weeks after sexual initiation (29, 30). The male partner can also experience pain and complications (18, 31, 32).

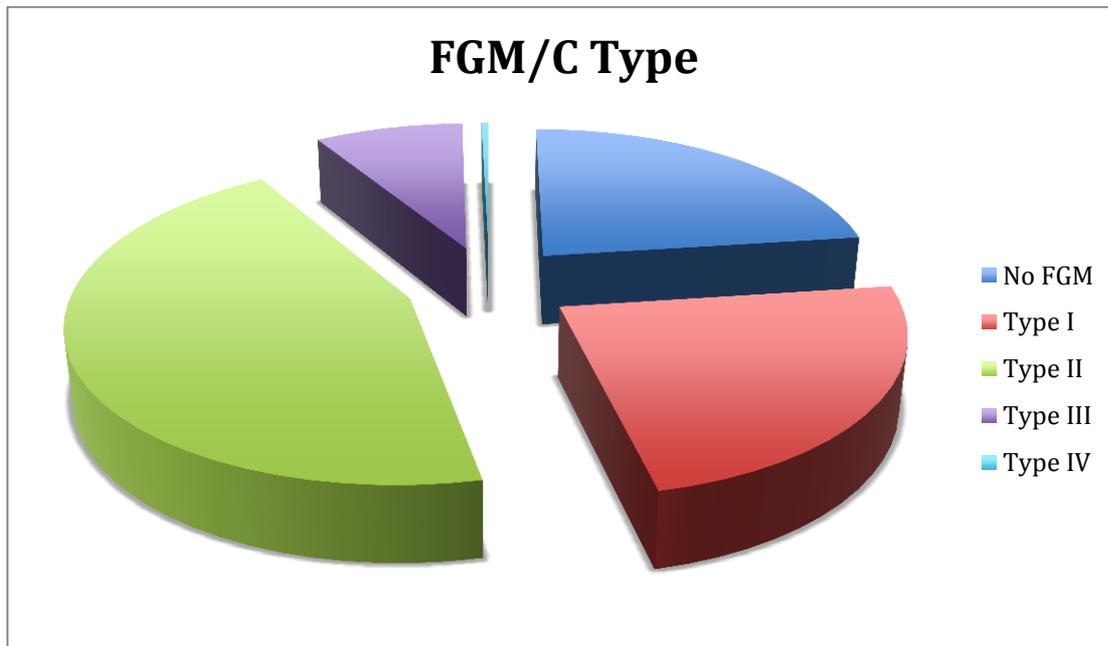
Some studies have shown an increased likelihood of fear of sexual intercourse, post-traumatic stress disorder, anxiety, depression and memory loss. It should be noted that the cultural significance of the practice might not protect against psychological complications. The pain, shock and the use of physical force by those performing the procedure are mentioned as reasons why many women describe female genital mutilation as a traumatic event (15, 33).

The incidences of caesarean section and postpartum haemorrhage are substantially increased, in addition to increased tearing and recourse to episiotomies (12, 34). The risks increase with the severity of the female genital mutilation. Studies from affluent societies suggest that FGM/C is not associated with prolonged labour (35). Obstetric fistula is a complication of prolonged and obstructed labour, and hence may be a secondary result of birth complications caused by female genital mutilation (36, 37). Higher neonatal death rates and reduced Apgar scores have been found in women with FGMC, the severity increasing with the severity of FGM/C (12). However, a Swedish study did not find perinatal death associated with FGM/C (38).

RESULTS

A total of 1,569 participants were recruited into the study, 23% had no FGM/C while 77% had FGM/C. The figure below shows the proportion of the different forms of FGM/C in the study participants. Only 6 cases of type IV FGM/C were recruited into the study.

Figure: Proportion of different types of FGM/C in the study



The age range of study participants ranged from 18 to 46 years with a mean age of 26.5 years. The parity of study participants ranged from 0 to 11 with an average of 2.1. About 41.4% of the participants had no form of education, 28.2% had primary or non-formal education, 23.1% had secondary education and 7.3% had tertiary education. Concerning their place of usual residence, 602 (39.2%) live in the rural areas while 933 (60.8%) lived in urban areas. The study participants were distributed into the following tribes: Mandinka (36.7%), Fula (27.1%), Wolof (14.3%), Jola (9.1%), Serahule (3.3%), Serere (2.8%), Manjago (1.4%) and others comprising of Jahanka, Woyinko, Konyagi and other minority tribes making up 5.2%.

Table 1 shows the baseline characteristics of the study population stratified by the presence or absence of FGM/C and the type of FGM/C where present.

Table 1. Baseline characteristics stratified by FGM types.

Variable	No FGM (n=361)	WHO type 1 (n=372)	WHO type 2 (n=704)	WHO type 3 or 4 (n=132)^f	p
Age in years, n (%)					
<i>Median (1st-3rd quartiles)</i>	27 (22-31)	25 (21-30)	25 (22-30)	24 (20-29)	<0.001 [#]
<20	32 (8.9)	61 (16.4)	89 (12.6)	25 (18.9)	
20-24	94 (26.0)	107 (28.8)	225 (32.0)	50 (37.9)	
25-29	104 (28.8)	84 (22.6)	185 (26.3)	27 (20.5)	
30-34	81 (22.4)	75 (20.2)	118 (16.8)	13 (9.9)	
35 or greater	50 (13.9)	45 (12.1)	87 (12.4)	17 (12.9)	
Tribe, n (%)					
Mandinka	32 (8.9)	150 (40.3)	329 (46.7)	60 (45.5)	<0.001*
Fula	45 (12.5)	144 (38.7)	202 (28.7)	32 (24.2)	
Wollof	180 (49.9)	15 (4.0)	23 (3.3)	4 (3.0)	
Jola	25 (6.9)	29 (7.8)	75 (10.7)	13 (9.9)	
Other ^a	79 (21.9)	84 (9.1)	75 (10.7)	23 (17.4)	
Education level, n (%)					
None	148 (41.0)	171 (46.0)	284 (40.3)	50 (37.9)	0.08*
Primary/non-formal	93 (25.8)	102 (27.4)	210 (29.8)	36 (27.3)	
Secondary	94 (26.0)	82 (22.0)	147 (20.9)	38 (28.8)	
Tertiary	26 (7.2)	17 (4.6)	63 (9.0)	8 (6.1)	
Residence, n (%)					
Urban	248 (68.7)	201 (54.0)	431 (61.2)	87 (65.9)	<0.001*
Rural	113 (31.3)	171 (46.0)	273 (38.8)	45 (34.1)	
Height in cm, median (1st-3rd quartiles)^b	162 (158-167)	160 (155-165)	160 (156-165)	160 (156-165)	0.003 [#]
Weight in Kg, median (1st-3rd quartiles)^c	66 (60-75)	64 (58-72)	65 (59-73)	64 (58-72)	0.02 [#]
BMI in Kg/m², median (1st-3rd quartiles)^d	24.8 (22.9-27.9)	25.6 (22.5-27.4)	25.3 (22.9-27.9)	24.9 (22.7-27.7)	0.19 [#]
Number of previous life birth					

<i>Median (1st-3rd quartiles)</i>	2 (0-3)	2 (0-3)	1 (0-3)	0 (0-2)	<0.001 [#]
0	102 (28.3)	121 (32.5)	212 (30.1)	67 (50.8)	
1	67 (18.6)	64 (17.2)	157 (22.3)	28 (21.2)	
2	62 (17.2)	61 (16.4)	121 (17.2)	11 (8.3)	
3	49 (13.6)	45 (12.1)	79 (11.2)	9 (6.8)	
4	40 (11.1)	35 (9.4)	49 (7.0)	5 (3.8)	
<u>5 or greater</u>	41 (11.4)	46 (12.4)	86 (12.2)	12 (9.1)	
<u>Chronic medical conditions, n</u>					
<u>(%)</u>					
Yes	18 (5.0)	29 (7.8)	34 (4.8)	6 (4.6)	0.19*
No	343 (95.0)	343 (92.2)	670 (95.2)	126 (95.4)	
<u>Previous caesarean section, n</u>					
<u>(%)</u>					
Yes	5 (1.4)	21 (5.7)	26 (3.7)	4 (3.0)	0.02
No	356 (98.6)	351 (94.3)	678 (96.3)	128 (97.0)	
<u>Number of antenatal care visits, n (%)</u>					
<i>Median (1st-3rd quartiles)</i>	3 (3-4)	3 (3-4)	3 (3-4)	3 (3-4)	0.42 [#]
0	0 (0.0)	0 (0.0)	2 (0.3)	1 (0.8)	
1	14 (3.9)	18 (4.8)	32 (4.6)	10 (7.6)	
2	50 (13.9)	56 (15.1)	104 (14.8)	15 (11.4)	
3	100 (27.7)	108 (29.0)	187 (26.6)	46 (34.9)	
4 or greater	153 (42.4)	156 (41.9)	308 (43.8)	49 (37.1)	
Missing	44 (12.2)	34 (9.1)	71 (10.1)	11 (8.3)	

^a include Jahanka, Konyagi, Manjago, Serere, Serahule, Woyinko and other minority tribes. ^b Data were missing for 130 women who were excluded from the descriptive analysis. ^c Data were missing for 60 women who were excluded from the descriptive analysis. ^d Data were missing for 142 women who were excluded from the descriptive analysis. ^e Data were missing for 160 women who were excluded from the descriptive analysis. ^f Only six FGM type IV were found and recruited into the study.

[#] Kruskal-Wallis test. * Pearson chi-square test.

Table 2: Relationship between postpartum blood loss ≥ 500 ml and FGM/C type

FGM status	Cases/population	Percentage	Crude RR (95% CI) *	Adjusted RR (95% CI) **
No FGM	34/361	9.4	1.0	1.0
FGM I	67/372	18.0	1.9 (1.3 -2.8)	2.3 (1.5- 3.5)
FGM II	161/704	22.9	2.4 (1.7 – 3.4)	2.8 (1.9 – 4.1)
FGM III &IV	58/132	43.9	4.7 (3.2 -6.8)	5.1 (3.3 – 7.7)

* p-value = <0.001

** p-value = <0.001.

Table 2 shows that women with FGM/C were more likely to have postpartum haemorrhage (defined as blood loss of 500 ml or more). The risk of PPH increases with the severity of the FGM/C type.

Table 3: Caesarean Section risk and FGM/C type

FGM status	Cases/population	Percentage	Crude RR (95% CI) *	Adjusted RR (95% CI) **
No FGM	16/361	4.4	1.0	1.0
FGM I	36/372	9.7	2.2 (1.2 -3.9)	2.6 (1.3 – 5.3)
FGM II	81/704	11.5	2.6 (1.5 – 4.4)	3.1 (1.5 – 6.0)
FGM III &IV	16/132	12.1	2.7 (1.4 -5.3)	2.7 (1.2 – 6.0)

* p-value = 0.004

** p-value = 0.02

Table 3 shows that study participants with FGM/C were more likely to have caesarean section with the risk increasing based on the severity of the FGM/C type. However, when adjusted for age, residence, tribe and parity, this does not appear to be statistically significant.

Table 4: FGM/C type and perineal laceration (or episiotomy) risk

FGM status	Cases/population	Percentage	Crude RR (95% CI) *	Adjusted RR (95% CI) **
No FGM	76/361	21.1	1.0	1.0
FGM I	140/372	37.6	1.8 (1.4 -2.3)	1.7 (1.3 – 2.1)
FGM II	283/704	40.2	1.9 (1.5 – 2.4)	1.8 (1.4 – 2.2)
FGM III &IV	101/132	76.5	3.6 (2.9 -4.5)	2.8 (2.2 – 3.6)

* p-value = <0.001

** p-value = <0.001

Table 4 shows that study participants with FGM/C were more likely to have perineal laceration (or episiotomy) with the risk increasing based on the severity of the FGM/C type.

Table 5: Foetal outcome (perinatal death) and FGM/C type

FGM status	Cases/population	Percentage	Crude RR (95% CI) *	Adjusted RR (95% CI) **
No FGM	7/361	1.9	1.0	1.0
FGM I	13/372	3.5	1.8 (0.7 - 4.5)	1.9 (0.7 - 4.6)
FGM II	33/704	4.7	2.4 (1.1 - 5.4)	2.5 (1.1 - 5.7)
FGM III &IV	3/132	2.3	1.2 (0.3 - 4.5)	1.3 (0.3 - 5.1)

* p-value = 0.13

** p-value = 0.11

Table 6: Need for neonatal resuscitation and FGM/C type

FGM status	Cases/population	Percentage	Crude RR (95% CI) *	Adjusted RR (95% CI) **
No FGM	31/361	8.6	1.0	1.0
FGM I	50/372	13.4	1.6 (1.0 - 2.4)	1.9 (1.2 - 3.2)
FGM II	121/704	17.2	2.0 (1.4 - 2.9)	2.5 (1.6 - 4.0)
FGM III &IV	38/132	28.8	3.4 (2.2 - 5.2)	3.9 (2.4 - 6.5)

* p-value < 0.001

** p-value < 0.001

Table 5 and 6 shows the fetal outcomes. While FGM/C did not seem to be associated with stillbirths, however, babies born to participants with FGM/C were more likely to need resuscitation, the risk increasing with the severity of FGM/C.

Table 7: Association between LBW (<2500g) and FGM/C type

FGM status	Cases/population	Percentage	Crude RR (95% CI) *	Adjusted RR (95% CI) **
No FGM	30/361	8.3	1.0	1.0
FGM I	29/372	7.8	0.9 (0.6 - 1.5)	0.9 (0.6 - 1.5)
FGM II	57/704	8.1	1.0 (0.6 - 1.5)	0.9 (0.6 - 1.5)
FGM III	11/132	8.3	1.0 (0.5 - 1.9)	0.9 (0.5 - 1.7)

* p-value = 0.99

** p-value = 0.98

In Table 7 there was no association between FGM/C and low birth weight (LBW).

Table 8: Duration of labour (in hours) and FGM/C type

FGM status	Geometric mean	Crude geometric mean ratio (95% CI) (95% CI)*	Adjusted geometric mean ratio (95% CI) **
No FGM	5.9	1.0	1.0
FGM I	8.3	1.4 (1.3-1.5)	1.4 (1.3-1.6)
FGM II	8.9	1.5 (1.4-1.6)	1.6 (1.4-1.7)
FGM III & IV	10.6	1.8 (1.6-2.0)	1.8 (1.6-2.1)

* p-value = <0.001

** p-value = <0.001

Table 8 shows that the duration of labour for women with FGM/C type 1, type 2 and type 3/4 was 40%, 60% and 80% higher compared to those without FGM/C respectively, after controlling for age, residence, tribe, parity and chronic illness.

DISCUSSION

These data show that any form of FGM/C increases the risk of poor obstetric outcomes: postpartum haemorrhage of over 500ml, caesarean section and episiotomy or perineal tear. Neonatal outcomes are similarly shown to be poor for women with FGM/C; there was increased risk of need for neonatal resuscitation with all forms of FGM/C and perinatal death was shown to be increased in type II FGM/C. In types I and III FGM/C an increased number of perinatal deaths were observed compared with no FGM/C but these numbers were too small to demonstrate statistical significance. There was no statistically significant difference in risk of having a baby with birth weight under 2500g in women with FGM/C. Across all outcomes, as the type of FGM/C moves from type I to type III (corresponding with an increase in the severity of mutilation) then the risks increase further, adding weight to the argument that the association is causal.

These findings are in keeping with international data on outcomes of FGM/C in African countries (12).

Although no statistical significance in perinatal death among women with FGM/C type I and III was observed, this has been shown in other studies in similar settings. Despite being a relatively small study it was possible to show increased perinatal death in FGM/C type II, with a two-fold increase in risk. The increased rate of need for resuscitation is similarly striking and is likely to correlate to increased rates of hypoxic ischaemic encephalopathy (HIE) in babies who do survive with subsequent long-term disability.

There are multiple challenges around conducting research into FGM/C. Among communities where this is practiced there is an understandable reluctance to discuss the issue. There may be stigma in acknowledging that FGM has been performed, or that health consequences occur. As

such it is difficult to exclude the risk of recruitment bias for those women willing to join the study. However, the use of local midwives consenting women and performing data collection at each site aimed to ameliorate this risk.

This study was carried out at four health-care facilities across the country of the Gambia. As such there was a good representation of the tribal spread and the aim was to proportionally represent the varied population of the country. With a population of just 1.8 million people The Gambia is a small country that falls low on the human development index (165 out of 187 in 2012(39)), with high rates of absolute poverty and poor access to healthcare(40). Sadly, it faces multiple challenges in the field of health and typifies many of the issues surrounding the current crisis in human resources for health in Africa. As such, the additional health needs and risks posed by FGM/C are happening against a background of malnutrition, poor maternal and child health indicators and low rates gender equality(39).

Many of the population lack the means to travel or seek emergency help when required. As such richer women and those with access to healthcare may be over-represented in this study. Similarly women with pregnancy complications or risk of complex delivery may preferentially seek out healthcare settings and be overrepresented in this study.

The outcomes of need for episiotomy and caesarean section may represent a source of bias. The medical decision to progress to such measures had a subjective element and may show baseline variation in practice between settings. Healthcare worker's experience of FGM/C obstructing labour may lead to increased willingness to progress to these measures when FGM/C is noted to be present.

This study provides evidence for the significant harm posed by all types of FGM/C to maternal and child health in the Gambia. As such these data is a powerful tool for ongoing advocacy with the aim of eliminating FGM/C.

CONCLUSION

FGM/C in The Gambia was found to be associated with adverse obstetric outcomes – postpartum haemorrhage, increased caesarean section rates and increased perineal tears and episiotomy. The risks increase significantly with the severity of the type of FGM/C.

FGM/C is also associated with an increased risk for neonatal resuscitation. This risk also increases significantly with the severity of FGM/C. FGM/C in The Gambia does not seem to be a significant risk for perinatal death and low birth weight babies.

RECOMMENDATIONS

This study provides evidence of the harm posed by FGM/C to parturient women in The Gambia. FGM/C has been banned in The Gambia. However, there is fear that the practice can be driven underground. Advocacy and sensitization of Gambians is needed to end this practice. It is hoped that the result of this study will be useful in convincing people to abandon the practice. More qualitative research will be needed to understand the factors that are driving the practice in order to finally banish it from The Gambia.

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Appendix 1: Study Questionnaire

SCREENING

ID NO: HHF/XXXX

FGM Status: no FGM FGM I FGM II
FGM III FGM IV

Name & Signature (& date) of Person conducting the screening:

QUESTIONNAIRE

BIODATA

Date of birth: DD/MM/YYYY Age (years):

Tribe:

Education: None Primary/non-formal
Secondary Tertiary

MEDICAL HISTORY

Chronic Medical Illness: Yes No if yes state illness:

Previous Caesarean Section: Yes No if yes state Number:

Parity :

No. Previous live births:

Last Menstrual Period: DD/MM/YYYY

Estimated Gestational Age (Weeks):

How was the gestational age estimated? LMP Early
USS

Fundal Height Others specify

Number of Antenatal care Visits:

Residence: Rural Urban

Did you have an episiotomy or perineal tear in any of your previous delivery?

Yes

No

Did you have blood transfusion in any of your previous delivery?

Yes

No

Did you have caesarean section in any of your previous deliveries?

Yes

No

EXAMINATION

Height (CM):

Weight (KG):

CONDUCT OF LABOUR

When did labour start? Time (Hours):

Date of admission in labour ward:

Time of admission in labour ward (Hours):

Cervical Dilatation on Admission in Labour Ward (CM):

Membranes ruptured: Yes No

Name & signature of interviewer (& date):

Date of delivery :

Time of Delivery (hours):

Duration of labour (Minutes):

Episiotomy: Yes No

Perineal Tear: Yes No

If Yes, degree of tear: 1st 2nd 3rd 4th

Type of delivery: SVD Vacuum

Forceps

Caesarean Section

Destructive

OP

If Operative delivery, Indication for Operative Delivery:

Estimated Blood Loss (ml): _____

Fetal Outcome: Livebirth FSB MSB

Early neonatal Death

Birth weight (Kg): _____

Apgar Score: at 1-Minute _____ at 5

Minutes _____

Did the baby need resuscitation at delivery? Yes No

If Yes, Level of resuscitation required: Suction Oxygen Ambu bag

Cardiac Compression Intubation
Drugs

Gestational age assessment of the newborn _____ (Weeks)

Name & signature of accoucheur (and date):

Apgar score chart

	0 (Points)	1	2
Appearance	Blue or pale all over	Blue extremities, but torso pink	Pink all over
Pulse	None	< 100	≥ 100
Grimace	No response	Weak grimace when stimulated	Cries or pulls away when stimulated
Activity	None	Some flexion of arms	Arms flexed, legs resist extension
Respirations	None	Weak, irregular or gasping	Strong cry

0-3 Critically Low, 4-6 Fairly Low, 7-10 Generally Normal

Appendix 2: List of Data Collectors

1. Dr. Momodou T Nyassi – Site Investigator, Bansang Hospital
2. Ousman Darboe – Midwife, Bansang Hospital
3. Fatoumatta Barrow - Midwife, Bansang Hospital
4. Suntu Saïdy - Midwife, Bansang Hospital
5. Samba Baldeh - Midwife, Bansang Hospital
6. Dr. Lucas Jatta – Brikama Major Health Centre
7. Fatou Camara -- Midwife, Brikama Major Health Centre
8. Olimatou Johnson – Midwife, Brikama Major Health Centre
9. Jainaba Darboe – Midwife, Brikama Major Health Centre
10. Neneh Mendy – Midwife, Brikama Major Health Centre
11. Dr. Neneh Bah – Site Investigator, EFSTH
12. Dr. Awa Jah – Co-Investigator, EFSTH
13. Fatou Khan – Midwife, EFSTH
14. Sohna Marena – Midwife, EFSTH
15. Ndey Bah – Midwife, EFSTH
16. Sarah Fullah – Midwife, EFSTH
17. Dr. Dado Jabbie – Site Investigator, JFPH
18. Amie Njie – Midwife, JFPH
19. Kaddijatou Bah – Midwife, JFPH
20. Maimuna Tamba – Midwife, JFPH
21. Majula T Kinteh – Midwife, JFPH

Appendix 3: List of Trainers

1. Dr Patrick Idoko – Gynaecologist
2. Dr. Matthew Anyawu – Gynaecologist
3. Dr Mustapha Bittaye – Gynecologist & Research Clinician
4. Dr. Olubukola Idoko – Paediatrician & Research Clinician
5. Dr. Alice Armitage - Paediatrician