OBSTETRICAL HEALTH CONSEQUENCES OF FEMALE GENITAL MUTILATIONS/CUTTINGS: EVIDENCE FROM ITALIAN HOSPITAL DISCHARGE RECORDS

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Abstract. More than 230 million women live with FGM/C worldwide, a condition linked to adverse health consequences, and for which the quality of available health care is often inadequate. As it is hard to identify and reach migrant women with FGM/C living in host countries, the research on this population group in Europe is limited. This paper focuses on the Italian context. The aim is to investigate the probability for immigrants coming from countries where FGM/C is practiced to be hospitalised for FGM/C-related obstetrical issues, using data from Italian Hospital Discharge Records for the year 2019. Results show that an increase of 1 percent point in the home country FGM/C prevalence is correlated with an increase of 0.43% in the probability of being hospitalised for an FGM/C-related obstetrical condition. Further research should aim at differentiating between the FGM/C types, with a focus on the most harmful practices, i.e. infibulation, and at investigating other potential health consequences, such as physical, sexual and psychological conditions.

1. Introduction

The term "female genital mutilation or cutting", hereafter FGM/C, refers to any procedure of modification, partial or total removal or other injury to the female genital organs for non-medical reasons (WHO, 2018). According to the last available figures for the countries practicing FGM/C in Africa, the Middle East and Asia where survey data is available, more than 230 million girls and women live today with FGM/C, a 15% increase compared to data released in 2016 (UNICEF, 2024). However, FGM/C is an umbrella term encompassing extremely different, often geographically specific, practices, which is why the World Health Organisation (WHO) classifies FGM/C into four different types.

The causes underlying FGM/C differ greatly across typologies and territories. In some places FGM/C is seen as an important rite of adulthood passage; in other communities FGM/C is (wrongly) believed to enhance female fertility; Type III FGM/C, i.e. infibulation, is often performed to ensure chastity; in other cases, the

fear of breaking social conventions, which would lead to undesired consequences such as lower chances of marriage, plays a strong role as well (Berg *et al.*, 2010a).

Research on FGM/C is hampered by difficulties in reaching the population of interest. As there are no nationally representative surveys on FGM/C in non-practicing countries, direct estimations of the number of women living with FGM/C in Europe are not available. However, other types of estimations have been proposed, commonly based on applying the home-countries FGM/C prevalence rate to the known number of immigrants in destination countries, although such approach is not caveat free (Ortensi *et al.*, 2015).

Across Europe, it has been estimated that 578,068 women aged 10 or more lived with FGM/C in 2011 (Van Baelen *et al.*, 2016), the majority of which were born in East-Africa (Somalia, Egypt, Ethiopia, Eritrea, Kenya, Sudan and Djibouti). In Italy, indirect estimates calculated using data from 2010, 2011 and 2016 indicate respectively a number of 57,000 (Farina *et al.*, 2016), 59,700 (Van Baelen *et al.*, 2016), and 60-80,000 women living with FGM/C (Ortensi *et al.*, 2018). It should be noted that these three estimations are not directly comparable as the considered age brackets differ: 15-49 in the first study, 10+ in the second study and 15+ in the third study.

Women living with FGM/C incur in a number of adverse health consequences, both short- and long-term (Klein *et al.*, 2018; Reisel *et al.*, 2015), whose complication extent depends largely on the FGM/C type (Chibber *et al.*, 2011). It has been estimated that 1 in 500-1,000 FGM/C results in death (Reyners, 2004). Other health consequences pertain physical health, e.g. higher incidence of urinary tract infections and complications of delivery (Berg *et al.*, 2014); mental health, such as depression, anxiety and PTSD (Abdalla and Galea, 2019); sexual health, including pain during intercourse and reduced sexual satisfaction (Berg *et al.*, 2010b); and psycho-social wellbeing, such as adverse effects on women's sense of identity and self-esteem (O'Neill and Pallitto, 2021). However, the quality of the studies, particularly on mental and sexual consequences, is generally weak (Abdalla and Galea, 2019; Berg *et al.*, 2010b). Finally, adverse health consequences are also exacerbated by inadequacy of care (Evans *et al.* 2019a; Evans *et al.*, 2019b; Turkmani *et al.*, 2018).

In Italy, some efforts have been put forward to address the practice of FGM/C and its consequences. In 2006 the parliament passed a law prohibiting FGM/C, that introduced the development of informative campaigns, training of health workers, instituted of a tollfree number, international cooperation programmes and the responsibility of the institution where the crime is committed, and recognised that doctors have a role in eliminating FGM/C by educating patients and communities (Turillazzi and Fineschi, 2007). Nevertheless, evidence highlights inadequate levels

of awareness of health practitioners regarding FGM/C practices and legislation (Surico *et al.*, 2015; Caroppo *et al.*, 2014).

2. Data and Methods

2.1 Data

The present study uses data from the universe of Italian hospital discharge records (HDRs) database (Italian Ministry of Health, Planning Department, *schede di dimissione ospedaliere*, SDO) for the year 2019. For each hospital episode, the data report information on up to six medical diagnoses and procedures, codified according to the International Classification of Diseases, Ninth Revision (ICD-9-CM), plus contextual variables (region, province, and local health authority, i.e. LHA), demographic characteristics of the patient (age, sex, country of citizenship), socio-economic variables (marital status, educational level, health insurance status) and type of hospital (private, public). The initial 2019 dataset includes 8,537,262 observations. As the analysis focuses on female immigrants' health, from the dataset We drop all observations of male sex. Moreover, we include only citizens of countries were FGM/C is known to be practices. Finally, we drop observations younger than 15 years old. This results in a dataset of 26,988 observations. Given that in the dataset is not possible to uniquely identify individuals, we cannot track patients over time. The unit of analysis is therefore the hospitalisation event.

2.2 Methods

The outcome variable is the proportion of FGM/C complications linked to obstetrical health, over the number of hospitalizations. In the main analysis, only the principal diagnosis was considered in order to identify FGM/C-related obstetrical hospitalisations. The conditions were selected following the classification proposed by Cottler-Casanova *et al.* (2020), who operationalized previous descriptive literature by identifying a list of relevant ICD-9 diagnosis codes, reported in Table 1, which include selected complications of pregnancy, labour, delivery and the puerperium.

Table 1 – *FGM/C obstetric and perinatal ICD-9 complications & codes.*

Complications of pregnancy, childbirth, and the puerperium[1]	***ICD-9 code***
Pregnancy with abortive outcome	
Spontaneous abortion (634)	
Spontaneous abortion complicated by genital tract and pelvic infection	634.0
Complications mainly related to pregnancy	
Anemia complicating pregnancy childbirth or the puerperium	648.2
Normal delivery, and other indications for care in pregnancy, labor and delivery	
Disproportion in pregnancy labor and delivery (653)	
Outlet contraction of pelvis in pregnancy labor and delivery	653.3
Fetopelvic disproportion	653.4
Disproportion of other origin in pregnancy labor and delivery	653.8
Unspecified disproportion in pregnancy labor and delivery	653.9
Abnormality of organs and soft tissues of pelvis (654)	
Congenital or acquired abnormality of vagina complicating pregnancy childbirth or the puerperium	654.7
Congenital or acquired abnormality of vulva complicating pregnancy childbirth or the puerperium	654.8
Complications occurring mainly in the course of labor and delivery	
Obstructed labour (660)	
Obstruction by abnormal pelvic soft tissues during labor	660.2
Failed forceps or vacuum extractor unspecified	660.7
Other causes of obstructed labor	660.8
Unspecified obstructed labor	660.9
Long labour (662)	
Prolonged second stage of labor	662.2
Trauma to perineum and vulva during delivery (664)	
First-degree perineal laceration during delivery	664.0
Second-degree perineal laceration during delivery	664.1
Third-degree perineal laceration during delivery	664.2
Fourth-degree perineal laceration during delivery	664.3
Unspecified perineal laceration during delivery	664.4
Vulvar and perineal hematoma during delivery	664.5
Other specified trauma to perineum and vulva during delivery	664.8
Unspecified trauma to perineum and vulva during delivery	664.9
Other obstetrical trauma (665)	
High vaginal laceration during and after labor	665.4
Other obstetrical injury to pelvic organs	665.5
Obstetrical pelvic hematoma	665.7
Other specified obstetrical trauma	665.8
Unspecified obstetrical trauma	665.9
Postpartum hemorrhage (666)	
Third-stage postpartum hemorrhage	666.0
Other immediate postpartum hemorrhage	666.1
Delayed and secondary postpartum hemorrhage	666.2
Postpartum coagulation defects	666.3

[1] Source: Cottler-Casanova *et al.* (2020).

Table 1 (cont.)– *FGM/C obstetric and perinatal ICD-9 complications & codes.*

Complications of pregnancy, childbirth, and the puerperium[2]	***ICD-9 code***
Other complications of labor and delivery not elsewhere classified (669)	
Maternal distress	669.0
Obstetric shock	669.1
Maternal hypotension syndrome	669.2
Acute kidney failure following labor and delivery	669.3
Other complications of obstetrical surgery and procedures	669.4
Forceps or vacuum extractor delivery without mention of indication	669.5
Breech extraction without mention of indication	669.6
Cesarean delivery without mention of indication	669.7
Other complications of labor and delivery	669.8
Unspecified complication of labor and delivery	669.9
Complications of the puerperium	
Major puerperal infection (670)	
Major puerperal infection, unspecified	670.0
Puerperal endometritis	670.1
Puerperal sepsis	670.2
Puerperal septic thrombophlebitis	670.3
Other major puerperal infection	670.8
Other complications of the puerperium not elsewhere classified (674)	
Disruption of obstetrical perineal wound	674.2

The main independent variable is an indicator of FGM/C prevalence in the origin country, as reported in the UNICEF Global Databases[3] (Appendix Table A.1), following the epidemiology approach used by several researchers in order to estimate correlation between home country and country of destination behaviours (Fernández, 2011). The equation to be estimated can be expressed as follows:

$$Hosp = \alpha + \beta\, FGMCprevalence + \gamma\, Controls + \delta + \varepsilon \qquad (1)$$

Where $Hosp$ is a dummy that takes value one if the hospitalisation refers to an obstetrical condition linked to FGM/C, and takes value zero if it refers to any other medical condition; $FGMCprevalence$ is a continuous variable that indicates the home country FGM/C prevalence according to the citizenship of the hospitalised woman, $Controls$ is the set of controls outlined above, δ indicates the Local Health Authority fixed effects and ε is the error term. In this equation, β is the parameter of main interest.

[2] Source: Cottler-Casanova *et al.* (2020).
[3] Source: data.unicef.org, accessed on 22 November 2021.

3. Results

Table 2 describes the hospital discharge records database according to age, education, marital status, health insurance and hospital type. For completeness, we report descriptive statistics for the sample of interest, i.e. immigrant women coming from countries were FGM/C is known to be practiced, along with the Italian sample and the sample of all other immigrants. On average, immigrants from FGM/C countries are younger than the other groups, have lower education and are less frequently hospitalised in private hospitals.

Table 2 – *Hospital discharge records (HDR) database, hospitalisations characteristics, 2019.*

	Immigrants from FGM/C countries		Italian		Other immigrants	
	N.	%.	N.	%	N.	%
Age class						
15-24	5,296	19.74	168,129	4.52	28,094	11.44
25-34	10,924	40.72	396,038	10.65	80,803	32.91
35-44	6,744	25.14	439,597	11.82	58,954	24.01
45-54	1,932	7.20	430,100	11.57	31,553	12.85
55-64	809	3.02	480,654	12.93	25,116	10.23
65-74	628	2.34	621,113	16.71	13,824	5.63
75 or older	495	1.85	1,182,078	31.80	7,196	2.93
Total	26,828	100.00	3,717,709	100.00	245,540	100.00
Education						
No/elementary	3,964	14.78	763,917	20.55	23,023	9.38
Lower secondary	7,641	28.48	770,708	20.73	67,806	27.62
Upper secondary	4,571	17.04	788,788	21.22	62,634	25.51
University	1,661	6.19	355,568	9.56	20,891	8.51
Missing	8,991	33.51	1,038,728	27.94	71,186	28.99
Marital status						
Married	10,593	39.48	1,448,813	38.97	96,989	39.50
Missing	9,735	36.29	1,144,237	30.78	86,064	35.05
Health insurance						
NHS	26,370	98.29	3,594,116	96.68	239,502	97.54
Co-pay	458	1.71	123,593	3.32	6,034	2.46
Type of hospital						
Private	3,261	12.16	1,082,978	29.13	38,984	15.88
Public	23,486	87.54	2,625,976	70.63	205,745	83.79
Missing	81	0.30	8,755	0.24	811	0.33

Table 3 reports the ORs of being hospitalised for a FGM/C-related disease, given the share of cut women in home countries. As the focus in on obstetrical diagnosis, the sample is restricted to women below 44 years old.

Table 3 – *Logistic regression results (ORs) for the likelihood of hospitalisations due to FGM/C-related obstetrical conditions, 2019.*

	Hospitalisation for FGM/C-related obstetrical conditions
FGM/C % in home country	1.0043***
	(1.003 - 1.006)
Age (ref: 25-34)	
15-24	0.8372***
	(0.735 - 0.954)
35-44	0.5406***
	(0.476 - 0.614)
Education (ref: Upper secondary)	
No/elementary	0.8727
	(0.716 - 1.063)
Lower secondary	0.9818
	(0.843 - 1.144)
University	1.1297
	(0.901 - 1.416)
Missing	1.0393
	(0.885 - 1.221)
Marital status (ref: Unmarried)	
Married	1.7872***
	(1.516 - 2.106)
Missing	1.6016***
	(1.348 - 1.903)
Health insurance (ref: Other)	
NHS	3.0176***
	(1.510 - 6.031)
Hospital type (ref: Private)	
Public	1.8875***
	(1.457 - 2.446)
Missing	6.6278***
	(2.534 - 17.333)
Observations	22,835
Local Health Authority FE	YES

**** p<0.01, ** p<0.05, * p<0.1 Robust cieform in parentheses.*

Results show that for a one-unit increase in the home-country FGM/C prevalence, it is expected a 0.43% increase in the likelihood of hospitalisation for an obstetrical FGM/C-related conditions, after controlling for individual characteristics and

province fixed effects. Being hospitalised in a public rather than a private hospital, under a public rather than private or co-pay insurance, and being unmarried has a positive correlation with the likelihood of hospitalisation for a FGM/C-related condition. As robustness check, we performed the same analysis (1) looking for FGM/C related diagnosis in all six diagnosis fields rather than in the principal diagnosis field only; (2) using an alternative data source for the main independent variable of interest, i.e. share of women living with FGM/C in home countries (Ortensi et al. 2018)4; and (3) combining these two robustness checks. The results remain significant at the 99% confidence level, with similar magnitude: OR 1.0032 (95% CI 1.002 - 1.005) in the robustness check (1); OR 1.0042 (95% CI 1.002 - 1.006) in the robustness check (2); and OR 1.0029 (95% CI 1.001 - 1.004) in the robustness check (3).

4. Conclusions

Using Hospital Discharge Record (HDR) data from 2019, we investigated the prevalence of obstetrical health consequences due to FGM/C among immigrants from countries where FGM/C is practiced. Results showed that, among immigrants from FGM/C-practicing countries, a one-unit increase in the home-country FGM/C prevalence is correlated with a 0.43% increase in the rate of hospitalisation for obstetrical FGM/C consequences. This positive and statistically significant correlation suggests that women who have undergone the practice are more likely to experience severe pregnancy-related health issues. FGM/C can cause scar tissue, inflexibility, and narrowing of the vaginal opening, all of which contribute to obstructed labor and perineal trauma. Our data show a clear connection between these anatomical alterations and adverse outcomes such as prolonged labor, perineal lacerations, and postpartum hemorrhage. The high incidence of cesarean deliveries and instrumental births (forceps or vacuum extractor) in our study population highlights the difficulty some of these women face in delivering naturally. These findings indicate a pressing need for preemptive obstetric interventions and individualized care plans for women with FGM/C, particularly those experiencing high-risk pregnancies. This places additional strain on healthcare systems, requiring specialized care and longer hospital stays, particularly in cases of obstructed labor or perineal trauma. These findings underscore the need for healthcare professionals to be trained in managing FGM/C-related complications, which will become increasingly critical as the population of women from FGM/C-practicing countries grows. Finally, the obstetric complications associated with FGM/C not only affect

[4] See Appendix Table A.1

the mother but can also have detrimental consequences for the child. Prolonged labor, obstructed labor, and the need for emergency interventions like cesarean sections increase the risk of neonatal morbidity and mortality.

The study suffers from several limitations. First, has the HDRs are compiled by health practitioners rather than ad-hoc trained personnel, the level of data accuracy is lower compared to most survey data. For example, the data records a large number of missing values for marital status and education. We dealt with this issue by creating a residual category that includes the missing values for these two variables. Moreover, outcomes on sexual conditions and psychological health, both indicated in the literature as medical areas affected by the practice of FGM/C, could not be studied due to the low number of observed cases as well as endogeneity issues. Indeed, other factors such as migration patterns and extreme conditions in the country of origin (wars) are likely to be correlated both with citizenship and psychological health.

The association between FGM/C prevalence in home countries and the rate of obstetric complications in Italy underscores the need for targeted public health strategies. Efforts should focus on educating at-risk immigrant populations about the health risks of FGM/C, promoting alternative rites of passage, and offering access to specialized obstetric care. Furthermore, policies aimed at early identification and counseling of pregnant women with FGM/C could help mitigate complications during delivery, ultimately reducing hospitalizations and improving maternal outcomes.

There is a need for more studies on the long-term reproductive health outcomes of FGM/C survivors and for enhanced training programs for medical staff to recognize and manage FGM/C complications effectively. We would encourage future research on health consequences of FGM/C to focus on these understudied areas of interest. Further quantitative and qualitative research is needed to investigate the diffusion of FGM/C among immigrants in destination countries in general, and especially second generation and undocumented immigrants. Research should aim also to understand the mechanisms behind the preservation of this practice in destination countries, with the goal of developing empowering strategies for all women at risk to get freedom of choice on their own bodies.

Appendix Table

Table A.1 – *Share of women living with FGM/C in home countries (main independent variable).*

Country	UNICEF global databases[5] (2021)	Ortensi *et al.* (2018)[6]	Country	UNICEF global databases (2021)	Ortensi *et al.* (2018)
Somalia	99.2	97.9	Chad	34.1	38.4
Guinea	94.5	96.9	Senegal	25.2	24.7
Djibouti	94.4	93.1	CAR	21.6	24.2
Mali	88.6	91.4	Kenya	21.0	21.0
Egypt	87.2	87.2	Nigeria	19.5	24.8
Sudan	86.6	86.6	Yemen	18.5	18.5
Sierra Leone	86.1	89.6	Maldives	12.9	-
Eritrea	83.0	83.0	Tanzania	10.0	14.6
Burkina Faso	75.8	75.8	Benin	9.2	9.2
Gambia	75.7	74.9	Iraq	7.4	8.1
Mauritania	66.6	69.4	Togo	3.1	4.7
Ethiopia	65.2	65.2	Ghana	2.4	3.8
Guinea-Bissau	52.1	44.9	Niger	2.0	2.0
Indonesia	-	49.0	Cameroon	1.4	1.4
Liberia	44.4	49.8	South Sudan	-	1.4
Côte d'Ivoire	36.7	38.2	Uganda	0.3	1.4

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[5] Data source used in main regression specification.
[6] Data source used as robustness check.

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