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Universal Female Genital Mutilation and High Burden of Infibulation in Mogadishu: Cross-Sectional Study on Severity, Types, and Associated Factors Among Adolescent Girls in Somalia

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ABSTRACT

Background and Aims: The study aimed to investigate the prevalence, determinants, types, severity, and perceived health consequences of Female Genital Mutilation (FGM) among adolescent girls aged 12–19 in Mogadishu, Somalia. The primary objective was to quantify the burden of different FGM types and identify socio-cultural predictors.

Methods: A community-based, cross-sectional study was conducted with 418 adolescent girls in four districts using a multi-stage cluster sampling method between March 2024 and June 2024. Data were classified according to the World Health Organization (WHO) definition of FGM severity. Multivariable ordered logistic regression was used to identify factors associated with severity, reporting adjusted odds ratios (AOR) and 95% confidence intervals (CI).

Results: The results showed a universal FGM prevalence (100%, $n = 418/418$) among participants. The most common form was Type I (67.0%, $n = 280/418$), followed by Type III (infibulation) (24.9%, $n = 104/418$) and Type II (8.1%, $n = 34/418$). Multivariate analysis revealed that higher maternal education was a significant protective factor. Compared to daughters of illiterate mothers, those whose mothers had primary education (AOR = 0.35; 95% CI: 0.17–0.76; $p = 0.008$) or university-level education (AOR = 0.42; 95% CI: 0.19–0.93; $p = 0.03$) had lower odds of undergoing more severe FGM. Conversely, adolescents reporting no peer influence regarding FGM had significantly higher odds of experiencing more severe types (AOR = 3.86; 95% CI: 1.75–8.52; $p < 0.001$).

Conclusion: FGM is a universal practice among adolescent girls in Mogadishu, with a concerningly high prevalence of infibulation. Maternal education is a critical protective factor. Eradication efforts must prioritize female secondary and tertiary education and challenge the internalized social norms that sustain the practice, without external peer pressure.

1 | Introduction

Female Genital Mutilation (FGM) comprises all procedures involving the partial or total removal of the external female genitalia or other injuries to the female genital organs for non-medical reasons [1]. Global efforts led by the WHO and UNICEF have intensified to eliminate FGM by 2030; however, it remains a grave violation of human rights [2, 3]. FGM offers no health benefits and instead poses serious immediate

and long-term health risks, violating the fundamental rights to health, security, and freedom from torture [4, 5]. These clinical risks encompass both immediate trauma and long-term morbidity, such as clitoral epidermal inclusion cysts, a complication that highlights the severe physical toll of the practice [6].

The World Health Organization (WHO) classifies FGM into four main types: Type I (clitoridectomy), Type II (excision), Type III (infibulation), and Type IV (other harmful procedures). Infibulation, the most severe form, involves narrowing of the vaginal opening and is directly correlated with the most intense adverse health consequences, including chronic pain, obstetric emergencies, and the development of clitoral epidermal inclusion cysts [6].

The persistence of FGM is driven by a complex interplay of socio-cultural, economic, and familial factors [4, 7, 8]. At its core, FGM is a powerful social norm often tied to concepts of purity, family honor, and a girl's marriageability [5, 9]. This social pressure makes abandonment difficult, even for families aware of its harm. While frequently misattributed to religious doctrine (often categorized locally under the term “Sunna”), the practice predates major religions and is not mandated by them [10]. Socio-economic factors are also strong predictors; lower levels of parental education and poverty are consistently associated with higher rates of FGM [4, 11, 12]. Family dynamics are pivotal, as a mother's FGM status and the influence of older female relatives are powerful determinants of the continuation of the practice across generations [11–13].

Globally, over 200 million girls and women have been subjected to FGM, with millions more at risk annually. The practice is most concentrated in Africa, where Somalia stands out as an epicenter of the crisis [4, 10]. While neighboring nations with high rates of FGM, such as Sudan and Egypt, have begun to witness gradual declines in prevalence due to sustained advocacy and legislative changes, Somalia maintains a near-universal national prevalence [6, 10]. The 2020 Somalia Demographic and Health Survey (SDHS) confirmed a near-universal national prevalence of 99% among women aged 15–49, one of the highest rates in the world [10]. The crisis in Somalia is defined not only by its prevalence but also by the extreme severity of the most commonly performed FGM type. The SDHS reported that Type III FGM (infibulation) was performed on 64% of circumcised women [10], exposing the majority of Somali girls and women to the highest risks of severe complications, including hemorrhage, chronic pain, infertility, and life-threatening obstetric emergencies [10, 14].

This public health emergency was exacerbated by the uniquely challenging national context. Decades of conflict, political instability, and humanitarian crises have severely weakened Somalia's health infrastructure and impeded the reach of state services, hindering the enforcement of protective policies and the dissemination of anti-FGM messaging [10]. In the capital, Mogadishu, a complex social landscape of urban and internally displaced populations means that traditional norms remain deeply entrenched. Strong community pressure and limited economic opportunities for women combine to perpetuate FGM in this city [10]. Although the overall prevalence is known to be high, there is a need for more granular, community-based data on the specific types, severity, and contemporary drivers of FGM among urban adolescents. This study aims to fill this gap by investigating these factors among adolescent girls in Mogadishu.

2 | Materials and Methods

2.1 | Study Design and Setting

This study employed a community-based cross-sectional design to investigate the prevalence, types, and determinants of FGM among adolescent girls in Mogadishu, Somalia. Data were collected between March 2024 and June 2024. Mogadishu's complex urban environment, shaped by conflict and displacement, provides a critical context for understanding the persistence of traditional practices. Four districts—Huriwa, Yakhshiid, Daynile, and Dharkenlay—were selected to ensure representative data.

2.2 | Study Population and Eligibility Criteria

The study population comprised adolescent girls aged 12–19 years who were permanent residents of the selected districts.

- Inclusion criteria: adolescent girls aged 12–19 residing in the selected areas who provided informed assent and, for those under 18, had parental or guardian consent.
- Exclusion criteria: girls outside the 12–19 age range or those unwilling or unable to provide the required assent or consent.

2.3 | Sample Size and Sampling Procedure

The sample size of 418 was calculated using the single population proportion formula, assuming a 50% prevalence, 95% confidence level, 5% margin of error, and design effect of 1.1. A multistage sampling procedure was used.

1. First stage: four districts were randomly selected from the 18 districts in the Banadir region.
2. Second stage: two sub-districts were randomly selected from each chosen district (a total of eight sub-districts).
3. Third stage: within each sub-district, households were selected using systematic random sampling, and one eligible adolescent girl per household was invited to participate until the proportional target for that sub-district was met.

2.4 | Data Collection and Variables

Data were collected via interviewer-administered semi-structured questionnaires, adapted from a previous study and validated through translation and back-translation (English–Somali–English).

- Dependent variable: FGM severity, ordered categorically based on the WHO classification (Type I < Type II < Type III).

- Independent variables: included socio-demographics (age, parental education), practice-related factors (performer, perceived benefit, peer influence), and knowledge of health consequences.

2.5 | Data Analysis

Data were analyzed using Stata version 16.0. Descriptive statistics were used to summarize the participants' characteristics and FGM prevalence. Categorical variables were compared using Pearson's χ^2 test. Finally, a multivariable ordered logistic regression model was used to identify factors independently associated with FGM severity. Results are presented as adjusted odds ratios (AOR) with 95% confidence intervals (CI). Statistical significance was set at $p < 0.05$.

2.6 | Ethical Approval and Consent to Participate

Ethical approval for this study was obtained from the Somali National University Institutional Review Board (IBR) (ref no. SNU/SPHR/0158/2024). All procedures were performed in accordance with the ethical standards of the Institutional Research Committee and the 1964 Helsinki Declaration and its later amendments. Informed assent was obtained from all adolescent participants, and informed consent was obtained from a parent or legal guardian for all participants aged < 18 years.

3 | Results

A total of 418 adolescent girls from Mogadishu participated in this study. All (100%, $n = 418/418$) reported having undergone some form of FGM. The most prevalent form was Type I (Sunna), reported by 67.0% ($n = 280/418$) of the respondents. The most severe form, Type III (infibulation), was experienced by 24.9% ($n = 104/418$), while Type II was the least common at 8.1% ($n = 34/418$), as shown in (Figure 1).

3.1 | Socio-Demographic Factors and FGM Type

χ^2 analyses revealed significant associations between FGM type and several socio-demographic factors (Table 1). A significant difference was observed across age groups ($\chi^2 = 20.05$, $p < 0.001$), with Type III FGM being more prevalent among younger adolescents (12–15 years, 29.9%, $n = 66/221$) than among older adolescents (16–19 years, 19.3%, $n = 38/197$).

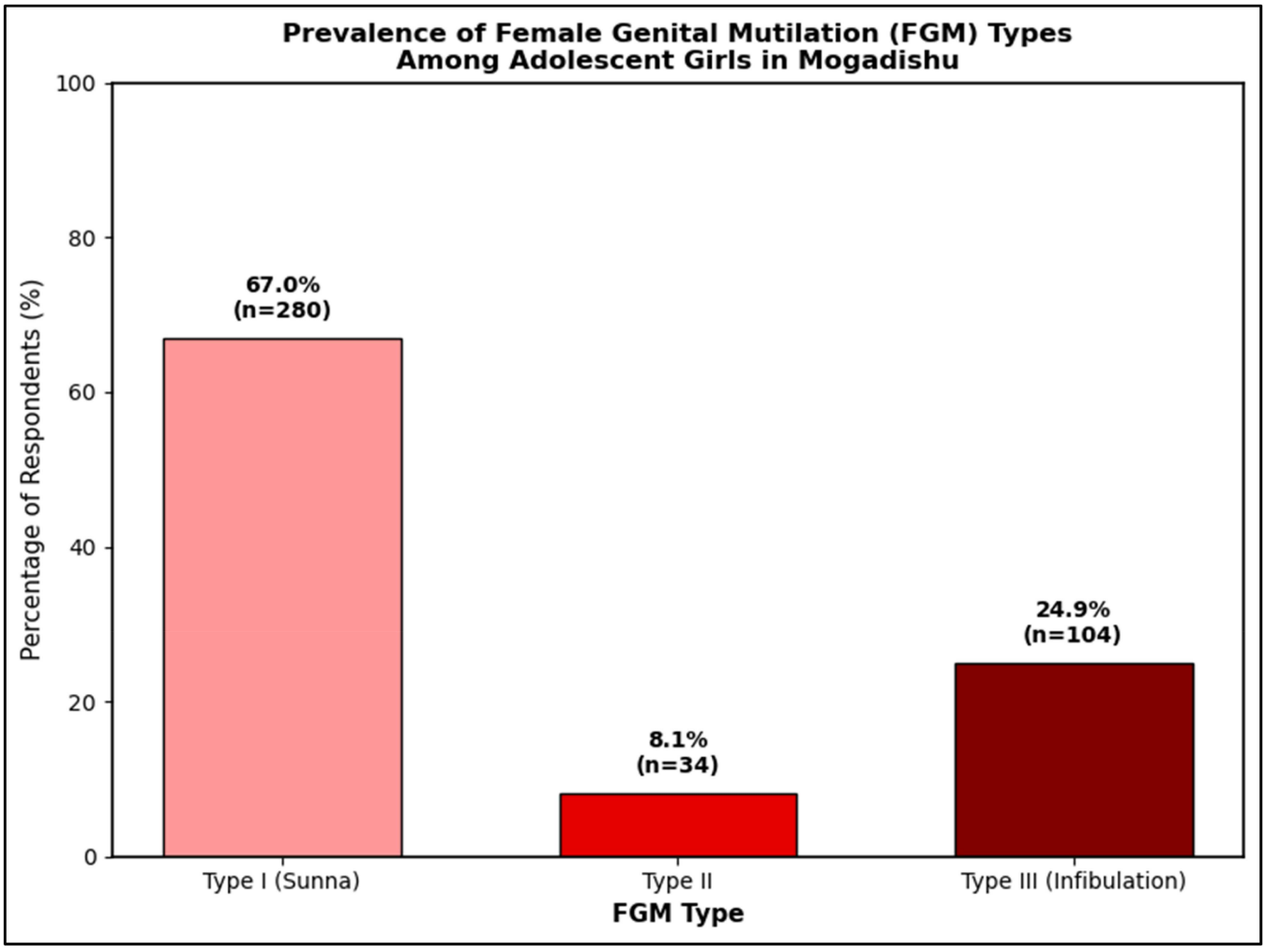

FIGURE 1 | Distribution of female genital mutilation (FGM) types among adolescent girls in Mogadishu, Somalia ($N = 418$).

TABLE 1 | Association between FGM type and socio-demographic factors ($N = 418$).

Characteristic	Category	Type I *N* (%)	Type II *N* (%)	Type III *N* (%)	χ^2	*p* value
Age group (years)	12–15	128 (57.9)	27 (12.2)	66 (29.9)	20.05	< 0.001
	16–19	152 (77.2)	7 (3.6)	38 (19.3)		
Marital status	Divorce	6 (50.0)	3 (25.0)	3 (25.0)	42.92	< 0.001
	Married	19 (40.4)	11 (23.4)	17 (36.2)		
	Single	252 (71.6)	17 (4.8)	83 (23.6)		
	Widow	3 (42.9)	3 (42.9)	1 (14.3)		
Respondent education	Secondary	24 (53.3)	9 (20.0)	12 (26.7)	10.71	0.03
	Primary	213 (68.7)	22 (7.1)	75 (24.2)		
	Illiterate	43 (68.3)	3 (4.8)	17 (27.0)		
Family income (USD)	< $100	30 (54.5)	12 (21.8)	13 (23.6)	19.95	0.003
	$100–$300	173 (67.6)	14 (5.5)	69 (27.0)		
	$301–$500	62 (69.7)	8 (9.0)	19 (21.3)		
	> $500	15 (83.3)	0 (0.0)	3 (16.7)		
Father's education	Illiterate	22 (42.3)	12 (23.1)	18 (34.6)	28.82	< 0.001
	Primary	75 (72.1)	7 (6.7)	22 (21.2)		
	Secondary	78 (63.9)	7 (5.7)	37 (30.3)		
	University and above	105 (75.0)	8 (5.7)	27 (19.3)		
Mother's education	Illiterate	74 (56.9)	21 (16.2)	35 (26.9)	21.20	0.002
	Primary	111 (70.3)	9 (5.7)	38 (24.1)		
	Secondary	56 (68.3)	3 (3.7)	23 (28.0)		
	University and above	39 (81.3)	1 (2.1)	8 (16.7)		
Residence	IDP camp	5 (62.5)	0 (0.0)	3 (37.5)	10.44	0.107
	Rural	57 (78.1)	2 (2.7)	14 (19.2)		
	Slum area	6 (54.5)	0 (0.0)	5 (45.5)		
	Urban	212 (65.0)	32 (9.8)	82 (25.2)		

Both father's education ($\chi^2 = 28.82$, $p < 0.001$) and mother's education ($\chi^2 = 21.20$, $p = 0.002$) were significantly associated with the FGM type. Type III was most frequent among daughters of illiterate fathers (34.6%, $n = 18/52$) and less common among daughters of mothers with a university education (16.7%, $n = 8/48$). Furthermore, family income ($\chi^2 = 19.95$, $p = 0.003$) and marital status ($\chi^2 = 42.92$, $p = 0.00$) were identified as significant correlates of FGM type.

3.2 | Practice-Related and Knowledge Factors

Several practice-related and knowledge-based factors were significantly associated with the type of FGM experienced (Table 2).

The practitioner who performed the procedure was a key determinant ($\chi^2 = 11.06$, $p = 0.026$). Procedures performed by traditional female circumcisers were far more likely to be Type III (29.3%, $n = 66/225$) compared to those performed by health workers, which were predominantly Type I ("Sunna") at (85.0%, $n = 17/20$). The perceived benefit of FGM was also strongly associated with its type ($\chi^2 = 31.58$, $p = 0.001$). Notably, social acceptance as a justification was linked to the highest proportion of Type III infibulation (43.4%, $n = 33/76$), while those reporting "no benefit" were more likely to have undergone Type I (72.8%, $n = 142/195$).

Furthermore, a consistent and highly significant pattern emerged regarding participants' knowledge of the health consequences. Across multiple indicators, adolescents who were aware of specific health risks were significantly more likely to have undergone the less severe Type I ("Sunna") form. As shown in Table 2, this association was strong for awareness of immediate risks like tissue swelling ($\chi^2 = 19.98$, $p < 0.001$; 80.0%, $n = 120/150$ aware vs. 61.1%, $n = 88/144$ unaware), urine retention ($\chi^2 = 23.36$, $p < 0.001$), and impaired healing ($\chi^2 = 21.93$, $p < 0.001$). Adolescents with information on general health consequences were significantly less likely to have undergone Type III (13.6%, $n = 21/154$) compared to those without such information (31.4%, $n = 83/264$; $\chi^2 = 19.24$, $p < 0.001$).

3.3 | Independent Predictors of FGM Severity

A multivariable ordered logistic regression model was used to identify the independent predictors of FGM severity, controlling for confounders (Table 3). After adjustment, maternal education remained a significant protective factor. Compared to adolescents with illiterate mothers, those whose mothers had

TABLE 2 | Practice and knowledge-related factors associated with FGM type ($N = 418$).

Characteristic	Category	Type I *N* (%)	Type II *N* (%)	Type III *N* (%)	χ^2	*p* value
Person who performed FGM	Health worker	17 (85.0)	0 (0.0)	3 (15.0)	11.06	0.03
	Traditional birth attendant	127 (73.4)	11 (6.4)	35 (20.2)		
	Traditional female circumciser	136 (60.4)	23 (10.2)	66 (29.3)		
Age at circumcision	< 7 years	72 (63.2)	10 (8.8)	32 (28.1)	1.06	0.59
	≥ 7 years	208 (68.4)	24 (7.9)	72 (23.7)		
Perceived benefit of FGM	Better marriage prospect	8 (61.5)	3 (23.1)	2 (15.4)	31.58	0.001
	Cleanliness	43 (75.4)	4 (7.0)	10 (17.5)		
	More sexual pleasure for male	2 (40.0)	2 (40.0)	1 (20.0)		
	No benefit	142 (72.8)	14 (7.2)	39 (20.0)		
	Religious approval	49 (68.1)	4 (5.6)	19 (26.4)		
	Social acceptance	36 (47.4)	7 (9.2)	33 (43.4)		
	Don't know	114 (64.8)	9 (5.1)	53 (30.1)		
Re-infibulation status	Yes	82 (87.2)	1 (1.1)	11 (11.7)	23.34	< 0.001
	No	198 (61.1)	33 (10.2)	93 (28.7)		
Heard of FGM campaigns?	Yes	8 (80.0)	1 (10.0)	1 (10.0)	1.21	0.55
	No	272 (66.7)	33 (8.1)	103 (25.3)		
Knows FGM causes tissue swelling	Yes	120 (80.0)	10 (6.7)	20 (13.3)	19.98	< 0.001
	No	88 (61.1)	14 (9.7)	42 (29.2)		
	Don't know	72 (58.1)	10 (8.1)	42 (33.9)		
Knows FGM causes urine retention	Yes	120 (80.0)	10 (6.7)	20 (13.3)	23.36	< 0.001
	No	29 (60.4)	1 (2.1)	18 (37.5)		
	Don't know	131 (59.5)	23 (10.5)	66 (30.0)		
Knows FGM causes impaired healing	Yes	120 (80.0)	10 (6.7)	20 (13.3)	21.93	< 0.001
	No	90 (56.3)	14 (8.8)	56 (35.0)		
	Don't know	70 (64.8)	10 (9.3)	28 (25.9)		
Knows FGM causes psychological problems	Yes	125 (79.1)	10 (6.3)	23 (14.6)	18.87	0.001
	No	67 (63.2)	10 (9.4)	29 (27.4)		
	Don't know	88 (57.1)	14 (9.1)	52 (33.8)		
Has information on health consequences	Yes	123 (79.9)	10 (6.5)	21 (13.6)	19.24	< 0.001
	No	157 (59.5)	24 (9.1)	83 (31.4)		

primary education (AOR = 0.35, 95% CI: 0.17–0.76) or university-level education (AOR = 0.42, 95% CI: 0.19–0.93) had significantly lower odds of experiencing a more severe form of FGM (i.e., Type II/III vs. Type I).

The influence of social dynamics was also highly significant. Adolescents who reported no peer influence regarding FGM had nearly four times higher odds of undergoing a more severe FGM type compared to those who reported some form of peer influence (AOR = 3.86, 95% CI: 1.75–8.52). Believing that FGM is important for social acceptance was also associated with higher odds of severity, although this finding was marginally significant (AOR = 3.54, $p = 0.060$). In the final model, respondent age, father's education, and type of practitioner were no longer statistically significant predictors.

4 | Discussion

This study confirms the deeply entrenched and universal (100% prevalence) nature of FGM among adolescent girls in Mogadishu. While neighboring nations with high rates of FGM, such as Sudan [15] and Egypt [16], have begun to witness gradual declines in prevalence due to sustained advocacy and legislative changes, Somalia maintains a near-universal national prevalence (99%),

TABLE 3 | Multivariable ordered logistic regression of factors associated with increased FGM severity ($N = 418$).

Characteristic	Category	Adjusted OR (AOR)[a]	95% CI	*p* value
Age	12–15 years	(Ref)	—	—
	16–19 years	0.637	0.364–1.115	0.114
Marital status	Divorced	(Ref)	—	—
	Married	2.259	0.599–8.520	0.229
	Single	0.930	0.266–3.254	0.909
	Widow	1.250	0.194–8.053	0.815
Education (mother)	Illiterate	(Ref)		
	Primary	0.354	0.165–0.759	0.008**
	Secondary	0.825	0.392–1.735	0.611
	University and above	0.420	0.189–0.931	0.033***
Education (father)	Illiterate	(Ref)		
	Primary	0.610	0.337–1.106	0.103
	Secondary	1.025	0.494–2.127	0.948
	University and above	0.728	0.263–2.013	0.540
Circumciser	Health worker	(Ref)		
	Traditional birth att.	3.037	0.619–14.901	0.171
	Traditional female circumcision	3.412	0.701–16.598	0.128
Perceived benefit of FGM	Better marriage	(Ref)		
	Cleanliness	0.658	0.165–2.629	0.554
	More sexual prospects	0.952	0.121–7.467	0.963
	No benefit	1.276	0.354–4.601	0.709
	Religious approval	1.315	0.351–4.926	0.685
	Social acceptance	3.540	0.949–13.203	0.060*
Peer influence	Yes	(Ref)		
	No	3.862	1.750– 8.522	0.001**

[a]Ordered logistic regression model adjusted for all variables listed in the table. FGM severity ordered as Type I < Type II < Type III.
*$p < 0.10$ (marginally significant); **$p < 0.05$; ***$p < 0.001$.

which stands in stark contrast to regional trends [10, 15, 16]. Global efforts led by the WHO and UNICEF have intensified to eliminate FGM by 2030 [17]; however, Mogadishu remains a critical epicenter where the practice remains resistant to change.

Our key contribution, however, is not confirming this prevalence but dissecting the determinants of its severity. While Type I ("Sunna") was the most common form (67.0%), the finding that nearly one in four girls (24.9%) undergoes Type III (infibulation) is alarming and underscores the extreme health risks faced by Somali adolescents, including chronic pain, obstetric emergencies, and the development of clitoral epidermal inclusion cysts [4, 6, 13, 18].

A central finding of this study is the significant protective role of maternal education in severe FGM. Adolescents whose mothers had completed primary or university education had significantly lower odds of more severe forms (Type II/III). This finding strongly corroborates large-scale analyses across sub-Saharan Africa, which have consistently linked higher female literacy and education to a reduction in FGM prevalence and a shift away from more severe types [2, 12]. The mechanism is likely multifaceted: educated mothers may have greater knowledge of FGM's health consequences, increased autonomy in household decision-making, and confidence to challenge or modify entrenched cultural norms [11]. Notably, the persistence of the practice despite education highlights that FGM is often viewed as a prerequisite for social inclusion rather than a purely religious requirement [18, 19]. While the father's education was significant in our bivariate analysis, it lost its predictive power in the final model. This suggests that in the context of Mogadishu, a mother's educational attainment is a more direct and powerful determinant of her daughter's FGM experience than the father's, highlighting the pivotal role of mothers as primary decision-makers.

The influence of social norms emerged as another powerful driver of FGM severity. The perception that FGM is essential for "social acceptance" was associated with a higher likelihood of undergoing more severe forms of FGM. This aligns with a vast body of literature that identifies marriageability and community belonging as the primary justifications for the practice [3, 5, 9]. More striking, however, was the counterintuitive finding that reporting no peer influence was associated with significantly higher odds of severe FGM (AOR = 3.86; 95% CI: 1.75–8.52; $p < 0.001$). This finding suggests a "normalization paradox": in community clusters where severe FGM (infibulation) is the absolute, unquestioned social norm, the practice is so deeply internalized that it is not perceived as external "peer pressure,"

but rather as an inherent cultural requirement [19, 20]. Conversely, adolescents who report "peer influence" may belong to social circles where FGM is actively discussed, debated, or even challenged, leading to greater awareness of social pressures and potentially a shift towards less severe forms. These findings underscore the significance of community-wide dynamics; the practice is perpetuated not merely by individual parental preference but through a collective "social lock-in" that necessitates synchronized communal abandonment [19, 21].

Our bivariate findings showed a paradoxical association, where girls with greater knowledge of FGM's health risks were more likely to have undergone a more severe type. This does not imply that knowledge is harmful. Instead, it likely reflects reverse causality, where girls who have suffered severe complications (such as tissue swelling or urine retention) are consequently more aware of the risks. This association disappeared in the multivariate model, indicating that while knowledge is important, it is often insufficient to counteract the overwhelming force of internalized social norms and family pressure, a finding consistent with studies in other high-prevalence settings [21, 22].

This study has several strengths, including its community-based design, focus on a vulnerable adolescent population in an urban post-conflict setting, and rigorous analysis of FGM severity. However, the limitations of this study must be acknowledged. The cross-sectional design precluded causal inference. Data were self-reported and may be subject to social desirability or recall bias, particularly regarding specific FGM types. Finally, the findings are specific to Mogadishu and may not be generalizable to rural or other regions of Somalia, where social dynamics may differ significantly.

4.1 | Strengths and Limitations

This study has several strengths, including its community-based design and focus on a vulnerable adolescent population in an urban, post-conflict setting. However, the limitations of this study must be acknowledged. The cross-sectional design precluded causal inference. Data were self-reported and may be subject to social desirability or recall bias, particularly regarding specific FGM types. Finally, the findings are specific to Mogadishu and may not be generalizable to rural regions, where social dynamics may differ.

5 | Conclusion and Recommendations

FGM is a universal practice among adolescent girls in Mogadishu, with a dangerously high prevalence of the most severe form (infibulation). Maternal education is a critical protective factor against FGM severity, highlighting the urgent need for policies prioritizing female secondary and tertiary education. Eradication efforts must move beyond simple awareness to challenge the internalized social norms that sustain the practice without external peer pressure. Policy interventions should adopt a two-pronged approach: (1) empowering mothers as agents of change through targeted education and (2) designing culturally sensitive programs that decouple social acceptance from FGM. Addressing these root drivers is essential for reducing the severity and ultimately eradicating this harmful practice in Somalia.

Author Contributions

A.A.A. contributed to the conception and design of the study, coordinated the material preparation, and supervised the data collection. M.A.O. conducted the formal data analysis, software, and interpretation. The section drafting responsibilities were as follows: Introduction–A.A.A.; Results–M.A.O.; Methodology–G.D.H.; Discussion–F.A.H. and H.M.S.; Conclusion and Recommendations—N.A.S.R. A.H.M. and O.S.E. critically reviewed the manuscript for important intellectual content and performed substantive editing. All authors have read and approved the final version of the manuscript. Ahmed Abdinasir Abdule and Mohamed Abdirahim Omar had full access to all of the data in this study and take complete responsibility for the integrity of the data and the accuracy of the data analysis.

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The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data sets generated and analyzed during the current study are not publicly available due to the sensitive nature of the topic and the need to protect participant confidentiality. However, the data are available from the corresponding author (Mohamed Abdirahim Omar) upon reasonable request.

Transparency Statement

The corresponding author, Mohamed Abdirahim Omar, affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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