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Relationship Between Knowledge, Years of Licensure, and Attitudes of Midwives About Female Genital Mutilation and Its Prevalence Among Their Patients in Bawku, Ghana

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2024

Abstract

Relationship Between Knowledge, Years of Licensure, and Attitudes of Midwives About Female Genital Mutilation and Its Prevalence Among Their Patients in Bawku, Ghana

by

Frank Debrah

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Female genital mutilation (FGM) is one of the hindrances to girls' development. FGM is often a rite of passage between childhood and adulthood. This cross-sectional study examined the relationship between the knowledge, years of licensure, and attitudes of midwives regarding FGM and the prevalence of FGM among their patients in Bawku, Ghana. Bronfenbrenner's social ecological model served as the theoretical framework to describe the link between midwives' knowledge, attitude, years of licensure, and FGM prevalence. The knowledge and attitude of midwives were classified as exosystem factors. Hence, their direct interaction with patients is likely to affect the patient's practice of FGM. The data were collected via online survey questionnaires from 55 registered midwives working in the Bawku Municipal District. Results of multiple linear regression indicated that both the knowledge and attitudes of midwives had a statistically significant effect on the number of FGM cases attended to by midwives. Results showed that midwives with strong attitudes in favor of FGM were more likely to report more cases of FGM than those who did not support FGM. The findings emphasize the transformative potential of focusing on midwives' knowledge and attitudes in the fight against FGM. The implications for positive social change included recommendations for extensive educational programs on the adverse consequences of FGM through workshops and seminars. Equipping midwives with knowledge, promoting attitudes against FGM, and fostering collaboration with various stakeholders may create a future free from FGM.

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Dedication

This dissertation is dedicated to all victims of female genital mutilation. May the outcome of this study highlight your everyday struggle with the trauma of physical and psychological pain for the world to unite and support in the fight against the practice. I also dedicate this study to all midwives in Bawku, Ghana working hard to educate their community about the dangers of female genital mutilation.

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Chapter 1: Introduction to the Study

Female genital mutilation (FGM) is often a rite of passage between childhood and adulthood and is performed in several countries (Obiora et al., 2020). FGM occurs between ages 4 and 14 (UNICEF, 2022). FGM is defined as a traditional practice that is a form of discrimination and represents violence against girls and women (Ali et al, 2020). The practice has been associated with norms (social and gender) targeting women to limit participation in the workforce, deny girls educational opportunities, and limit the power of women in society (Elnakib & Metzler, 2022; Obiora et al., 2020). FGM can lead to adverse physical and psychological health outcomes. Eliminating FGM is a pillar of sustainable development goals for equality and female empowerment (El-Dirani et al., 2022). Several international conventions, treaties, and national legislation condemn FGM (Seidu et al., 2021). FGM has been shown to violate the well-being, health, and bodily rights of girls and women and contravenes human rights declarations and the UN Convention against all discrimination among women (Farouki et al., 2022). FGM contradicts conventions against inhuman/degrading punishments, treatments, cruelty, and torture. FGM contravenes children's rights because it can be performed from ages 4 to 13 years. In 1994, the Ghanaian government outlawed FGM, and offenders (circumcisers) could undergo up to 3 years of imprisonment (Seidu et al., 2021). However, FGM is still prevalent in Northern Ghana, particularly in Bawku municipality.

Studies have indicated that gaps in skills and knowledge adversely impact the timely identification of needs and affect the management of FGM (Evans et al., 2019a). Also, provider attitudes have shifted with increased FGM medicalization (Doucet et al.,

2017). Furthermore, evidence indicated limited information on the availability of clinical guidelines and policies related to guidelines and poor implementation of evidence-based materials related to the care of FGM survivors (Dawson et al., 2022). Assessment of provider knowledge and attitudes may have future implications for education. Attaining eradication of FGM demands multisectoral actions, including the engagement of midwives, not only to deliver quality care to women and girls affected by FGM but also to evaluate midwives' knowledge and attitudes regarding FGM to address the medicalization of FGM, a growing concern. The current study was needed to empower midwives and other health care providers (HCPs) to decline requests to perform FGM and care for the needs of women and girls who have already undergone FGM. These efforts will aid in creating awareness and changing the attitudes of health care professionals in Ghana (Adogho et al., 2021). Furthermore, the current study may encourage midwives to determine their knowledge levels, skills, and attitudes regarding FGM practice.

This chapter summarizes literature related to the topic, identifies a gap in research, and explains why the current study was needed. The problem statement highlights the research problem and the evidence that the problem is relevant, current, and significant to public health, addressing the gap in practice. In addition, the chapter addresses the purpose of the study, intent, and variables, followed by the research questions and null and alternative hypotheses. The chapter also identifies the independent and dependent variables, associations tested, and measurement of variables. Further, the chapter discusses the conceptual or theoretical frameworks that were used in the study,

connections between crucial elements, and the nature of the study. Furthermore, the chapter discusses variables and definitions of important terms. The chapter also addresses the assumptions critical to the study and why they were necessary. Next, the chapter discusses the study's scope and delimitations, limitations due to methodological weaknesses, biases that could influence study outcomes, and measures to address limitations. The chapter concludes by addressing the significance of the study to public health, potential contributions to policy and practice, and implications for social change.

Background

More than 200 million women and girls have undergone FGM (Shakirat et al., 2020). The practice is shared among several countries, such as those around the Horn of Africa, the Atlantic Coast, the Middle East, Djibouti, Somalia, Cameroon, Uganda, Oman, India, and United Arab Emirates (Shakirat et al., 2020). With an increasing population of immigrants from areas where FGM is routinely practiced, cases are reported in Europe and America (Evans et al., 2019a). Ahinkorah et al. (2020) reported a high prevalence in sub-Saharan Africa, with an increased majority in West Africa in countries such as Burkina Faso, Sierra Leone, Guinea, and Mali and some sections in East Africa, notably Kenya, Tanzania, and Ethiopia. –

FGM in Ghana is more prevalent in northern Ghana, involving several ethnic groups such as the Busanga, Kusasi, Frafra, Nankam, Kassena, Walla, Sisala, Builsa, and Dagaabas (Akweongo et al., 2021). The prevalence is highest in the upper East region, Bawku municipality, Pusiga district, and the Kassena-Nankana districts (UNICEF, 2022). Despite the ban on the practice of FGM in Ghana, the prevalence is still high in Northern

Ghana compared to other regions, with Bawku municipality as high as 82% despite the ban on the procedure in 1994 (Ocran & Atiigah, 2022). The practice is common in Mali, Burkina Faso, and Togo, and the practice may be linked with a mixture of cultures from neighbouring countries and the people of Northern Ghana (Sakeah et al., 2018). Bawku municipality borders Togo and Burkina Faso. Similarly, the Pusiga district shares boundaries with Burkina Faso and Togo.

In one study, among 830 women sampled from Pusiga District and Bawku Municipality, 61% had undergone FGM (Sakeah et al., 2018). The Upper West region recorded the highest prevalence (50.5%), and the Eastern and Central regions recorded the lowest prevalence rates of 0.9% (Alhassan & Anyinzaam-Adolipore, 2021). Nonterah, Kanmiki, et al. (2020) established a prevalence of 24.7% in patients older than 35 years, indicating a 10-year decline in prevalence from 28.4% to 0.6% at the end of 2013. Easy movement across the border perpetuates the practice (Sakeah et al., 2019). FGM in Ghana is linked to region, area of residence, age at first marriage, health insurance coverage, ethnicity, functional difficulty, and wealth index quintile (Alhassan & Anyinzaam-Adolipore, 2021). Recent studies in Ghana have highlighted the thriving practice of FGM in certain parts of the country.

FGM is linked to adverse health outcomes such as obstetric problems, psychosocial impacts, adverse effects on sexuality, genitourinary infections, HIV/AIDS, pain, fever, excessive bleeding, fistula, difficulty urinating, disfigured vaginal area, and death, with an estimated of 1 in every 500 FGM cases resulting in death (Dilbaz et al., 2019; Turkmani et al., 2019). Other consequences include diminished sexual pleasure,

painful sexual intercourse, lack of sensation during intercourse, and a high risk of mortality and morbidity during pregnancy and childbirth (Elnakib & Metzler, 2022). FGM has adverse social consequences such as poor social well-being, diminished productivity and school attendance, early marriages, social isolation, and stigma (Pallitto & Ahmed, 2021; Pastor-Bravo et al., 2022). Infibulation is associated with vaginal problems such as infections, discharge, menstrual problems, swelling of genital tissue, excessive bleeding, and difficulty in childbirth (Nonterah, Agorinya, et al., 2020). In addition, the long-term effects are severe.

Despite FGM being a harmful practice related to several health complications (Balde et al., 2021), the question of the role of midwives in eradicating this practice has not attracted much attention in Ghana. Midwives are the primary sources of health care for women's reproductive health in rural areas of Ghana, such as Bawku, where FGM is perpetuated. FGM entails the excision of certain parts of the external female genitals. The practice has no medical benefits and is based on personal beliefs and traditions (Dilbaz et al., 2019). High prevalence and incidence of FGM are still reported worldwide, especially in sub-Saharan Africa (Seidu et al., 2022). In addition, studies have indicated that some health care professionals still support the practice of FGM (Akinsulure-Smith et al., 2021; Hinsliff-Smith & McGarry, 2021). There is a considerable need for policy and community-level interventions because many gaps are yet to be filled about FGM (Farouki et al., 2022).

Recent studies indicated that despite the efforts to eradicate this practice, districts of Upper East regions such as Bawku still record cases higher than the national average

(Alhassan & Anyinzaam-Adolipore, 2021). In another study, Sakeah et al. (2018) indicated a high prevalence of FGM in the Upper East region of Ghana, with Bawku municipality leading with an 82% prevalence rate. Attaining eradication of FGM demands multisectoral actions, including health sector engagement, to deliver quality care to women and girls affected by FGM and to evaluate midwives' knowledge, years of licensure and attitudes regarding FGM. Comprehending the position of HCPs is vital to abandoning FGM (Balde et al., 2021). This affirmed the relevance of examining the knowledge level of HCPs in the current study.

Midwives remain vital members of the health care team in Ghana (Ohene et al., 2022). Midwives focus on female reproductive health. Their role spans care, education, and women's pregnancy to childbirth (Acheampong et al., 2021). Midwives also ensure that the children remain healthy through immunization, weight monitoring, and educating the mothers on how to care for them. The Ghana Health Service allows midwives to practice autonomously in smaller clinics and communities and to refer complicated cases to hospitals with obstetricians. However, Nordmann et al. (2022) reported that there were cases in which midwives assisted in conducting FGM in the communities where they operate, in a process referred to as the medicalization of FGM. Nordmann et al. reported that the health care professionals in their study expressed mixed views about the harmfulness of the forms of FGM; 76.7% stated that some forms of FGM are not harmful, while 15.6% of nurses stated that all forms of FGM are not harmful. In addition, Balde et al. (2021) reported that health professionals felt no accountability or obligation to ensure that practitioners of FGM are reported to law enforcement agencies. Seven

percent of 150 health workers who participated in the study indicated that FGM was not harmful.

Midwives are integral to fighting FGM based on their role in Ghana's health sector (Ohene et al., 2022). Midwives may also possess relevant knowledge about the victims and promoters of the practice based on their understanding of the dynamics of the society in which they practice. Therefore, it is essential to understand midwives' knowledge, years of licensure and attitudes toward FGM practice as a significant step toward empowering them with relevant knowledge against FGM practice.

Problem Statement

With high prevalence rates of FGM in sub-Saharan Africa, HCPs must acquire training to meet the needs, expectations, and sociocultural needs of women who have undergone FGM (Evans et al., 2019b; Nordmann et al., 2022; Obiora et al., 2020). There has been limited research on midwives' knowledge, years of licensure, and attitudes toward FGM in Bawku-Ghana and how this affects the FGM prevalence rate. Other researchers have embarked on similar studies; however, none have been conducted in Ghana. Several studies have indicated that little formal education is provided in midwifery, nursing, or medical schools regarding FGM (Berg et al., 2017; Dawson et al., 2022; Evans et al., 2019b; González-Timoneda et al., 2018).

This problem is relevant to public health. HCPs have a role in providing information to women seeking surgical interventions for FGM. However, studies published within five years in global contexts have shown low levels of knowledge among HCPs (Molina-Gallego et al., 2021). About 13.7% of providers sampled from

institutions in Philadelphia reported having no formal education regarding the care of FGM patients (Levy et al., 2021). In Turkmani et al.'s (2018) study, 24% of midwives in Australia did not understand the classification of FGM. González-Timoneda et al. (2018) reported that only 15% of primary HCPs, including midwives, had received FGM training in Spain. Only 22.7% identified typology, and only 5% identified the correct geographical area. In the study by Molina-Gallego et al. (2021), only 10.7% of primary care providers identified the correct classifications, 8.64% knew protocols, and only 4.4% encountered an FGM. Correa Ventura and Báez Quintana (2021) reported that only 19% of clinicians, including midwives, had received training on FGM, and 6.3% claimed knowledge of a protocol of action. Studies on attitudes have not attracted much attention. In the African setting, Adogho et al. (2021) conducted a systemic review of knowledge, attitudes, and experiences of FGM in sub-Saharan Africa. Findings indicated that healthcare professionals may contribute to the increasing rate of FGM in sub-Saharan Africa. Adogho et al. called for further studies on the knowledge of HCPs. The current study addressed midwives' knowledge, years of licensure, and attitudes in Bawku, Ghana, an area with high prevalence rates of FGM.

Purpose of the Study

The purpose of this quantitative study was to examine the association between the knowledge, years of licensure, and attitudes among midwives about FGM and the FGM prevalence among their patients in Bawku, Ghana. The independent variables were the knowledge, years of licensure, and midwives' attitudes regarding FGM as measured by the Onuh et al. (2006) Attitude Scale. The dependent variable was the prevalence of FGM

among their patients in the Bawku district of Ghana. The study controlled for demographic variables such as age, ethnicity, and religion.

Research Questions and Hypotheses

This study included three research questions on the knowledge, attitudes, and years of licensure of midwives and the prevalence of FGM practice in Bawku, Ghana. The independent variables were attitudes, years of licensure, and knowledge, measured using a preexisting questionnaire developed by Onuh et al. (2006). This self-administered questionnaire was also used to collect demographic data such as age, religion, ethnicity, and postgraduate experience. The information related to the key variables included the knowledge of FGM and its types and deleterious effects. Those who had practiced FGM were asked for motivations supporting their decision. The following research questions and hypotheses guided the study:

RQ1: Is there an association between midwives' knowledge about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion?

H_o1: There is no association between the knowledge of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion.

H_a1: There is an association between the knowledge of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion.

RQ2: Is there an association between the attitudes of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion?

H_o2: There is no association between the attitudes of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion.

H_a2: There is an association between the attitudes of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion.

RQ3: Is there an association between years of practice and the prevalence of FGM in Bawku while controlling for age, ethnicity, and religion?

H_o3: There is no association between years of practice and the prevalence of FGM in Bawku while controlling for age, ethnicity, and religion.

H_a3: There is an association between years of practice and the prevalence of FGM in Bawku while controlling for age, ethnicity, and religion.

The survey developed by Onuh et al. (2006) guided the data collection process. The study variables were examined using primary data from midwives who completed the self-administered questionnaire. The plan for data analysis was multiple linear regression.

Theoretical and Conceptual Framework

Bronfenbrenner's social ecological model focuses on the theory that an individual's environmental factors can affect their behavior (Lee & Park, 2021;

Bronfenbrenner, 1977). The model has been divided into five environmental influences on behavior: microsystem, mesosystem, exosystem, macrosystem, and chronosystem (Lee & Park, 2021). The microsystem addresses how direct contact with an individual can influence their behavior and decision-making (Bell et al., 2022), and the mesosystem addresses the relationship among microsystems (Caperon et al., 2022). The exosystem includes factors that can influence an individual's behavior but have no direct contact with them (Bell et al., 2022). The macrosystem entails cultural factors that shape people's behavior (Scarneo et al., 2019). The chronosystem details life events that shape an individual's behavior (Scarneo et al., 2019). Based on the assessment of the different systems, the mesosystem was the most beneficial to my study. The exosystem highlights how direct interaction and relationships with the environment can negatively or positively affect an individual's behavior and decision-making (Hayden, 2019). According to Bronfenbrenner (1977), systems are interconnected and function together.

There were logical connections between the social-ecological model and the nature of the current study. The study examined the knowledge and attitudes of midwives in Bawku and how they affect the FGM prevalence rate among their patients. The social-ecological model facilitated an understanding of ways in which the attitudes and beliefs of midwives contribute to the practice and prevalence of FGM. The social-ecological model related to the knowledge and attitudes of midwives in Bawku-Ghana. The midwives represented the mesosystem level of the model by being one of the factors that can influence the behavior of the patients in the community. Midwives are part of the society in which FGM is practiced. The practice of FGM is grounded in the values and

tenets of the community. Therefore, the social-ecological model was ideal for understanding the impact of midwives on FGM. I used the social-ecological model to assess the association between the knowledge and attitudes of midwives and the practice and prevalence of FGM in the Bawku district of Ghana while controlling for age, ethnicity, and religion.

Nature of the Study

To answer the research questions in this quantitative study, I used a cross-sectional survey design (see Setia, 2016) with a sample of midwives in the Bawku district of Ghana. The study population was restricted to midwives practicing in Bawku, Ghana. The study had no restrictions for sex, age, or ethnicity. The survey developed by Onuh et al. (2006) guided the data collection process. The study variables were examined via primary data from midwives who completed the self-administered questionnaire conducted electronically by Open Data Kit software. The plan for data analysis was linear regression. The participants were selected based on exclusion and inclusion criteria. After selecting participants, I administered the structured questionnaire to collect data on exposure and outcomes. Data on both variables were collected concurrently after the recruitment of participants into the study (see Setia, 2016). The independent variables included the knowledge score, computed from the questions assessing midwives' knowledge of FGM, and the attitude score, computed from a series of questions assessing midwives' attitudes toward FGM and their years of licensure. The dependent variable was the prevalence rate of FGM, measured as the number of FGM cases reported by their

patients. The study controlled for several covariates such as age, religion, and age of midwives.

The strengths of this design included an inexpensive and fast method, giving insight into exposures or outcomes that could be conducted before a cohort study (see Wang & Cheng, 2020). Cross-sectional studies are helpful for public health monitoring, planning, and evaluation. The study surveyed participants on their knowledge, years of licensure, and attitudes regarding FGM to assess the association with the prevalence rate of FGM in Bawku, Ghana. Several researchers have employed this design. Correa Ventura and Báez Quintana (2021), González-Timoneda et al. (2018), Larsson et al. (2018), and Molina-Gallego et al. (2021) studied the knowledge and attitudes of HCPs using cross-sectional design.

Definitions

The literature provided extant definitions of FGM. However, Kawous et al. (2021) recognized the definition of therapeutic driven or cultural guided, total or partial external genitalia removal, or injury to a female genital organ. The classifications and explanations of FGM, per Kawous et al., included the following:

- Type I: Prepuce excision with or without part or entire clitoris
- Type II: Excision of clitoris with total/partial removal of labia minora
- Type III: Excision of entire or part of the external genitalia accompanied by narrowing/stitching of vaginal opening
- Type IV: Piercing/incising/picking, burning, stretching, or cauterization (burning) the labia and/or clitoris with surrounding tissues. This type can be

accompanied by scraping surrounding tissue, administering herbs or other corrosive substances to the vagina for narrowing/tightening, bleeding, or cutting the vagina.

Assumptions

Several assumptions were present in this study. The study included research questions on the knowledge and attitudes of midwives and the prevalence of FGM practice in Bawku, Ghana. The independent variables were attitudes, years of licensure, and knowledge, measured using a preexisting and validated questionnaire developed by Onuh et al. (2006). This self-administered questionnaire was also used to collect demographic data. I assumed this questionnaire was validated and reliable with good internal consistency. To my knowledge, no studies indicated the questionnaire's validity. Secondly, the study sample included midwives from Ghana. I assumed that participants had the qualifications to be midwives and had adequate knowledge to complete the questionnaire efficiently. I also assumed that participants would answer questions truthfully and openly and would not encounter challenges regarding the questions. Lastly, I assumed that data collection and analysis would uphold the highest ethical research standards and that reliability and validity were maintained throughout the study. I assured participants of the voluntary nature of participation and ensured their privacy to protect them. These assumptions were critical to the study because I assumed that participants' responses would guide the development of interventions targeting a decrease in FGM practice in Bawku, Ghana.

Scope and Delimitations

The study examined the association between the knowledge, years of licensure, and attitudes of midwives and the prevalence rate of FGM practice in Bawku, Ghana. The study population was restricted to midwives practicing in Bawku, Ghana. The study had no restrictions for sex, age, or ethnicity. Participants' educational background was completing a course on midwifery from an accredited institution. Foreign-trained and locally trained midwives were eligible to participate in the study provided they had passed licensing exams, satisfied requirements, and were registered by the Ghana Nursing and Midwifery Council. Selecting the Bawku geographical region was intended to ensure the availability of populations exposed to FGM and the ease of conduct of the study. This study's findings may provide insight into the attitudes and knowledge of Ghanaian midwives that may aid in the development of interventions to address FGM.

Limitations

The cross-sectional design was suitable for identifying the association between exposure and outcome. This design was suitable for providing information regarding the prevalence of outcomes and exposures (see Wang & Cheng, 2020). Cross-sectional studies are inexpensive and quick to conduct. However, several limitations were identified. First, the exposure and outcome variables are measured concurrently. Therefore, inferring a causal relationship from cross-sectional studies is limited. I could not make causal inferences about the prevalence rates because cross-sectional studies are observational and designed to provide a snapshot of current health issues (see Savitz & Wellenius, 2023). Several confounding variables have influenced the practice of FGM.

Confounding could not be ruled out in this cross-sectional study due to other variables associated with the exposure that could influence prevalence rates. Culture, gender norms, and social norms may distort the association between FGM prevalence and the knowledge and attitudes of midwives (Matanda et al., 2023; Obioha et al., 2022). In addition, I could not account for temporal associations between risk factors and outcomes; to establish a strong relationship between a risk factor and an effect in a study, researchers need enough time to follow and analyze the associations (Capili et al., 2021). The sampling plan in cross-sectional studies is essential to ensure the heterogeneity of the sample. The investigator admits to a sampling bias due to the likelihood of sampling some individuals in the target population over others, leading to selection bias. Lastly, the cross-sectional study is susceptible to recall and nonresponse bias (Wang & Cheng, 2020). All these limitations affect the strength of the findings.

To address the limitations, I ensured that the study population was appropriate for the research questions. The biases in sampling, including selection bias, were addressed via probability sampling. I defined the exposures and the outcomes and detailed potential bias regarding the accuracy of the measurement tool because the questionnaire was obtained through permission from another study. I identified the potential confounders and used a regression model to analyze the data while controlling for participant characteristics. The study was observational; hence, I sought to interpret the findings accurately. Respondent bias was a potential limitation given that some respondents might have been secretly involved in FGM but might not have disclosed it.

Significance

This study is significant because midwives in Ghana are the core HCPs for female reproductive health (Acheampong et al., 2021). No recent studies have addressed their knowledge, years of licensure, and attitudes toward FGM. Balde et al. (2022) indicated the need to conduct studies focusing on HCPs' views and knowledge on FGM because some HCPs have conflicting positions. No studies in Ghana-Bawku had focused on midwives' views and knowledge. The current study may identify strategic areas of intervention for health education and policy formulation to reduce rates of FGM in Ghana. Assessment of provider knowledge and attitudes may have future implications for education. Eradicating FGM demands multisectoral actions, including the engagement of midwives, not only to deliver quality care to women and girls affected by FGM but also to evaluate midwives' knowledge and attitudes regarding FGM to address the medicalization of FGM, a growing concern (Ahmed et al., 2022). The current study was needed to empower midwives and other HCPs to decline requests to perform FGM and to care for the needs of women and girls who have already undergone FGM. These efforts will aid in creating awareness and changing the attitudes of HCPs in Ghana (Opoku et al.,2023). Furthermore, the study may encourage midwives to determine their knowledge levels, skills, and attitudes regarding FGM practice.

Due to this study's significance to policymakers, HCPs, and other anti-FGM stakeholders in Ghana, it may inform key interventions, training programs, and policy initiatives to enhance midwives' knowledge and attitudes toward FGM. The study's social change implications include empowering midwives, promoting policy change,

fostering best practices in health care, and encouraging community engagement. The study may play an essential role in combating FGM cases in Bawku and beyond, thereby promoting the rights of women and girls.

Summary

FGM is a common rite of passage performed in several countries. Bawku municipality has recorded the highest rate of FGM prevalence in Ghana at 82% (Sakeah et al., 2018). The practice of FGM continues to rise in Bawku, Ghana, even though it is illegal (Obiora et al., 2020) because the knowledge and attitudes toward FGM among midwives are poorly understood. There has been limited research on midwives' knowledge and attitudes toward FGM in Bawku, Ghana, and how this affects the FGM prevalence rate. Other researchers conducted similar studies; however, none had been conducted in Ghana. Existing studies indicated that gaps in skills and knowledge adversely impact the timely identification of girls and women's needs and affect the management of FGM. This cross-sectional study examined the knowledge, years of licensure, and attitudes of midwives regarding FGM in Bawku districts, as measured by a scale developed by Onuh et al. (2006), and how these factors may be associated with the FGM prevalence rate among their patients. The independent variables were knowledge, years of licensure, and midwives' attitudes regarding FGM, as measured by the Attitude Scale of Onuh et al. The dependent variable was the prevalence of FGM among their patients in the Bawku district of Ghana. The study controlled for demographic variables such as age, ethnicity, religion, and years of licensure. The study was grounded on Bronfenbrenner's (1977) social ecological model. The research design was a cross-

sectional survey sampling midwives from the Bawku district of Ghana. This research was needed to empower midwives and other HCPs to care for the needs of women and girls who have already undergone FGM. The study may also help reduce the rising rates of FGM medicalization and support health practitioners and policymakers in their quest to decrease the practice's prevalence in Ghana and worldwide. Chapter 2 provides the literature search strategy, findings from reviewed literature, and a review of studies related to the conceptual/theoretical frameworks.

Chapter 2: Literature Review

FGM is a harmful practice that negatively impacts the health of women and girls (El-Dirani, 2022). The practice is prevalent in Bawku, at 82%, and practice continues to be sustained in certain areas, particularly Northern Ghana (Akweongo et al., 2021; Nonterah, Agorinya et al., 2020; Nonterah, Kanmiki, et al., 2020; Sakeah et al., 2019; Sakeah et al., 2018). Eradicating FGM demands multisectoral actions, including engagement of the health sector, not only to deliver quality care to women and girls affected by FGM but also to evaluate midwives' knowledge and attitudes regarding FGM. The purpose of this chapter is to provide a review of the literature on the prevalence of FGM in Ghana and other African nations, factors driving the practice of FGM, knowledge and attitudes of HCPs related to FGM, care of survivors, the medicalization of FGM, and interventions to address FGM. The first section details the literature search strategy, including databases, search engines, search terms, and keywords. This chapter describes the findings from the reviewed literature, which explains the problem's relevance and understanding of the issue. This is followed by a section detailing the conceptual and theoretical frameworks that guided the quantitative examination of the association between the knowledge and attitudes among midwives about FGM and the FGM prevalence rates in Bawku, Ghana.

Literature Search Methods

To provide an updated review of the literature, I incorporated peer-reviewed articles that addressed prevalence rates of FGM, adverse outcomes of FGM, attitudes and knowledge levels of midwives on FGM and FGM-related care, the efficacy of

implemented interventions to enhance skills and knowledge of midwives on FGM, and efforts to promote the abandonment of the practice. The review did not include non-scholarly literature. The articles selected were also screened to include those published between 2018 and 2023. The databases searched included Medline, PubMed Central, CINAHL, ProQuest Central Web of Science, and EMBASE.

The keywords used included *female genital cutting*, *female genital mutilation*, *female circumcision*, *excision*, *cutting*, *clitoridectomy*, *infibulation*, *FGM/C*, *FGM*, *Ghana*, *prevalence*, *incidence*, *healthcare providers*, *midwives*, *nurses*, *public health*, *knowledge*, *attitudes*, *learning*, *skills*, *FGM program*, and *FGM intervention*. The search strategy included searching by a combination of keywords using Boolean operators (and/or) and entering text-based queries into the seven databases. The selection of peer-reviewed articles was not limited to the study type. This review encompassed systematic reviews, meta-analyses, experimental studies, observational studies, integrative reviews, quality improvement projects, and integrative or scoping reviews. The articles included in this review were evidence-based journal articles published in English.

Theoretical Foundation

The theoretical framework of this study was built on Bronfenbrenner's (1977) social ecological model, which emphasizes that an individual's behavior is likely to be a product of the person's environmental factors. Bronfenbrenner's social ecological model is divided into five environmental influences on behavior: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. The microsystem examines how direct contact with an individual can influence their behavior and decision-making, and the

mesosystem examines the relationship among microsystems. The exosystem includes factors that can influence an individual's behavior but have no direct contact with them. The macrosystem entails cultural factors that shape people's behavior. The chronosystem details life events that shape an individual's behavior. The exosystem highlights that direct interaction and relationship with the environment can negatively or positively affect the behavior and decision-making of an individual (Bronfenbrenner,1977). According to Bronfenbrenner, systems are interconnected and function together.

According to Jeng and Mulugeta (2022), Bronfenbrenner's social ecological model is vital for understanding the complex interplay of human behavior and development factors because people develop in a social context due to interactions with different environmental factors. This model helped examine the relationship between FGM prevalence and the knowledge and attitudes of midwives in Bawku, Ghana. Knowledge and attitudes are believed to be behavioral aspects of human development and are greatly influenced by a person's environment. According to Fisher and Makleff (2022), the factors that promote the perpetuation of FGM can be linked to the social context. Fisher and Makleff argued that some factors promoting FGM prevalence are that FGM is seen as manifesting cleanliness and health, affirms fidelity, is socially accepted in several communities, and is a sign of marriageability. Therefore, a person develops perceptions of FGM due to the interaction of factors within their social context. I adopted the different components of Bronfenbrenner's (1977) social-ecological model of environmental influencers of behavior.

Microsystem

The first environmental influencers are categorized as the microsystem, representing the immediate environments in which individuals interact (Lee & Park, 2021). I considered midwives and the patients they are attending as the microsystem environment. Because midwives interact with their female patients more often than other health practitioners (Ahinkorah et al., 2020), I assumed that how the patients and midwives interact includes the attitudes, beliefs, and knowledge of the midwives about FGM. Due to their roles in Ghanaian health care, midwives are expected to spend more time with their patients because they are available at all health sector levels and engage in different procedures. Midwives significantly influence their patients and are likely to influence patients' decisions to go for FGM or not.

Mesosystem

Mesosystems are the connection between two or more microsystems and how they inform decision-making (Caperon et al., 2022). When two components of microsystems interact, there are likely to be several shared beliefs and protectives that they pass to each other. I considered two microsystems: the individual midwives and the female patients they attend to in their community. These microsystems are likely to influence the attitudes and knowledge of these midwives about FGM. In this study, I assumed the relationship between midwives and other microsystems indirectly influences the patient. This framework suggests that interactions between midwives and other health professionals, such as doctors and nurses, likely influence the midwives' knowledge and perception of FGM (see Mason, 2020). In this case, I assumed the patient's decision to

undergo FGM was influenced by the interaction between midwives and their counterparts.

Exosystem

In the exosystem, the focus is on social structures that have the power to affect an individual's decision-making capability (Bell et al., 2022). According to Obioha et al. (2022), large social structures such as schools and healthcare systems can be considered exosystems because they are large institutions with policies and regulations founded on the institutions that impact families and institutions working under them. I considered the exosystem to be the health care policies and guidelines set by health care or government agencies and professional bodies related to FGM. For instance, Ghana's policies recognize midwives and their crucial roles in health care. The hospitals also have rules, regulations, and policies on best practices and resource utilization that will likely affect the availability of resources and personnel who can aid with FGM. The midwives' support systems will also be affected, which will likely impact their knowledge and attitudes toward FGM.

Macrosystem

The macrosystem refers to the larger cultural, social, and political contexts (Scarneo et al., 2019). When looking at society's understanding and knowledge about FGM, I considered the government policies and measures taken against FGM in Ghana and the norms promoting FGM in Ghana. I also considered cultural norms, traditions, and societal attitudes towards FGM in Bawku and Ghana as a whole to constitute the macrosystem. Because the patients and midwives come from this community, these

cultural beliefs and practices may influence midwives' knowledge and attitudes toward FGM, as well as the prevalence of FGM or the willingness of patients to undergo FGM.

Chronosystem

I also considered the historical development relating to FGM practice. The chronosystem refers to the historical changes and developments likely to influence behaviors (Bell et al., 2022). There have been changes in factors relating to FGM, such as changes in cultural values, policies, and legislation, among other relevant factors. I considered the chronosystem to involve historical shifts in the understanding and perception of FGM, the conducting of awareness programs, and changes in policies and laws related to FGM. The chronosystem environment also included factors likely to influence FGM prevalence.

Based on these elements, Bronfenbrenner's (1977) social-ecological model helped me examine the relationship between midwives' knowledge and attitudes about FGM and FGM prevalence. The model facilitated the identification of several factors that have the potential to influence the FGM rate through the study of the five subdivisions, thereby allowing me to measure the relationship between the variables in the study. This framework's ability to consider various factors at different levels that influence the FGM prevalence rate was essential to ensure that the research accounted for many variations, thereby increasing the generalizability of the findings (Johnson-Agbakwu, 2023). I used this framework to provide a deeper understanding of the relationship between the FGM prevalence rate and the midwives' knowledge and attitudes, which may guide possible action plans for improving healthcare practices in the fight against FGM in Bawku and

Ghana. This framework has been widely applied in previous research to understand the factors relating to FGM. Using this framework, I examined FGM from a socioeconomic, psychosexual, religious, and cultural perspective. I broke down critical factors in each of the five levels of the model: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. This model helped me understand how social environments aid in promoting FGM across different perspectives.

Literature Review

Prevalence of FGM

UNICEF (2022) reported that at least 200 million women and girls across 31 countries had undergone FGM. The practice is common among countries near the Horn of Africa, the Atlantic Coast, and the Middle East (Ahmed et al., 2022). Prevalence of FGM has also been reported in densely populated Muslim countries such as Saudi Arabia, Oman, the United Arab Emirates, and Malaysia (Blaydes & Platas, 2020). There is evidence of the practice in North America, Europe, Australia, and other areas with immigrant populations (Evans et al., 2019a). The practice is also prominent in South Asia and some communities in the diaspora (Al Awar et al., 2020). UNICEF estimated the prevalence of FGM to be close to 1% in Cameroon and Uganda, 25% in Senegal, 87% in Sudan and Egypt, 89% in Mali, and 97%–98% in Guinea and Somalia. Ahinkorah et al. (2020) reported a high prevalence in sub-Saharan Africa, with an increased majority in West Africa in countries such as Burkina Faso, Sierra Leone, Guinea, and Mali and some sections in East Africa, notably Kenya, Tanzania, and Ethiopia. The prevalence of FGM in this Eastern part of Africa ranged between 52% for mothers and 13% for daughters.

The overall prevalence in sub-Saharan Africa ranged between < 1% to 44% among daughters and 4%–96% among women (Ahinkorah et al., 2020). The practice of FGM can be noted from these statistics as a global practice. However, the current study focuses on Ghana because the country has instituted policies to end the practice of FGM (see Farouki et al., 2022), including a ban and a punishment of imprisonment.

Nevertheless, there is still evidence of the practice in the country. The overall national FGM prevalence rate for Ghana stands at 4%, with the Upper East region recording a high of 38%. The rate is higher in Bawku Municipality, where FGM prevalence is 82% (Sakeah et al., 2018). Farouki et al. (2022) conducted a systematic review and meta-analysis and found that 100 million women and girls have undergone FGM. The findings differed from the projection of the UNICEF (2022). UNICEF projected a much higher prevalence rate of the practice due to the disruptions that the COVID-19 pandemic had caused. The pooled analysis revealed a prevalence of 37% among women in the bracket 15–49 years of age and 8% among girls below 15 years, based on a pooled analysis of 296,267 girls from 25 countries and 406,068 women from 30 countries. The most common cases were Type I and Type II. Type III was prominent in Sudan, and over half of the cases were in the Central African Republic. UNICEF indicated that traditional circumcisers did FGM. Mali had the highest prevalence of FGM among girls (72.7%), while Somalia had the highest prevalence (99.2%) among women (Farouki et al., 2022). The findings suggested that the prevalence had declined in 26 countries but has remained steadfast or increased in Somalia, Burkina Faso, and Guinea-

Bissau for women. In contrast, the incidence of FGM among girls had increased in Cameroon. The rates may be higher than what was reported.

Guinea was one of the countries reporting high levels of FGM in sub-Saharan Africa, with prevalence rates eclipsing 95% among women aged between 15 and 50 years (UNICEF, 2022). The prevalence varies across ethnic groups. The prevalence in the Toma ethnic group is 90%, while for Guerze, it is estimated at 68.4%. About 87% of girls between the ages of 5 and 9 reported undergoing the practice, with only 4% having undergone the practice after four years. Common FGM reported were Type I and Type II at 58% and Type III at 10% (Balde et al., 2022). Cutting without flesh removal was performed in about 11% of the cases. Anyanwu et al. (2022) studied the prevalence of FGM across generations among women aged 15 to 49 years in Nyanya district and Abuja Municipal and Bwari. Of 634 females, the prevalence of FGM was 8.7% in the third generation, 28.5% in the second generation, and 37.7% in the first generation. A prevalence of 8.7% is a public health concern. The prevalence in Sierra Leon eclipsed the 80% mark, with estimates of 89.6% in 2013 and a slight decrease from 91.3% in 2008 (UNICEF, 2022). Al Awar et al. (2020) indicated that the prevalence of FGM among 831 females was 41.4% among the United Arab Emirates population. FGM was performed in about 49% of children between 0 and 1 year of age. The epidemiology of FGM was 5% for Type III, 16.6% for Type II, and 62.8% for Type I. About 31.7% of participants reported that their daughters had undergone FGM, while 25% expressed interest in their daughters undergoing FGM in the future (Al Awar et al., 2020).

The estimated prevalence of FGM in Tanzania in the past two decades was 7.9 million girls and women. The prevalence is higher in the Northern region and is high in Kilimanjaro (10%), Arusha (41%), and Manyara (58%). In 2014, the cases of FGM represented 10.6%, a decline from 23.6% in 2005 (UNICEF, 2022). The study established a prevalence of 0.15% from a sample of 30,286 women from Northern Tanzania, Kilimanjaro region (Suleiman et al., 2021). The prevalence of FGM in Somalia is up to 98% for women between fifteen and forty-nine years old (UNICEF, 2022). The rates of infibulation are around 77%. Only about 29% of females supported continuing the practice, while 65% wanted it aborted (Yussuf et al., 2020).

Alhassan & Anyinzaam-Adolipore (2021) mentioned in their studies that about 500,000 girls and women have undergone the practice in Europe, with about 180,000 at risk annually. These figures may be underestimated or higher due to the immigrant population. There are about 69,086 emigrant women in Spain, with 18,396 being below the age of fourteen from countries that practice FGM (Alhassan & Anyinzaam-Adolipore, 2021). In Spain, at-risk populations that practice FGM are immigrants from Guinea, Gambia, Senegal, and Nigeria who reside in Andalusia, Catalonia, Madrid, and Valencia (González-Timoneda et al. 2018). Barcelona houses the most significant number of sub-Saharan migrants, followed by Madrid, Girona, and Valencia. FGM is punishable by imprisonment, and healthcare professionals must inform the judicial authority about the criminal acts of FGM (González-Timoneda et al., 2018). Providers treat cases of abuse in children and must make referrals to the police.

FGM in Ghana is more prevalent in northern Ghana, involving several ethnic groups such as the Busanga, Kusasi, Frafra, Nankam, Kassena, Walla, Sisala, Builsa, and Dagaabas (Akweongo et al., 2021). The prevalence is highest in the upper East region, Bawku municipality, Pusiga district, and the Kassena-Nankana districts (UNICEF, 2022). The practice is common in Mali, Burkina Faso, and Togo, and the practice may be linked with a mixture of cultures from neighboring countries and the people of Northern Ghana (Sakeah et al., 2018). Bawku municipality borders Togo and Burkina Faso. Similarly, the Pusiga district shares boundaries with Burkina Faso and Togo. The prevalence of FGM in Northern Ghana was estimated to be 4% (UNICEF, 2022). However, the range can rise to 20-30% for Upper West and East regions. The Upper East has a prevalence of 27.8% and 41% in the Upper West, while the Northern region has reported a 2.8% prevalence (Akweongo et al., 2021). In Pusiga, Upper East, the prevalence can be higher than 60% (UNICEF, 2022). Bawku municipality has recorded the highest rate of prevalence (>80%). In one study, among 830 women sampled from Pusiga District and Bawku Municipality, 61% had undergone FGM (Sakeah et al., 2018). In their study, Alhassan and Anyinzaam-Adolipore (2021) reported an overall prevalence of 11.7% among women predominantly from rural areas, the Ashanti region, with 37.2% from the Akan tribe. From this cluster, the Upper West region recorded the highest prevalence (50.5%), and the Eastern and Central regions recorded the lowest prevalence rates of 0.9% (Alhassan & Anyinzaam-Adolipore, 2021). Nonterah et al. established a prevalence of 24.7% in patients older than 35 years, indicating a ten-year decline in prevalence from

28.4% to 0.6% at the end of 2013. Easy movement across the border perpetuates the practice (Sakeah et al., 2019).

There is variation across types of FGM, circumstances resulting in the procedure, and the prevalence in populations. The data on prevalence is mostly from anecdotal studies and small-scale studies, and sometimes, there is inaccurate data to document the prevalence of FGM. The data indicate an overall decline in prevalence over the past decades (Stevenson & Kelly, 2022). However, some countries have not yet made progress in declining FGM rates. In Ghana, many women undergo FGM every year before age 15 years (Sakeah et al., 2018). Despite contravening several conventions and being outlawed in Ghana, the practice is predominant among some groups, particularly in Bawku. A deep exploration of drivers of FGM within these communities is fundamental.

Cultural Context of the Practice of FGM

The motivations supporting this practice include customs such as the rite of passage, preservation of chastity, cultural obligation, and enhancing prospects of getting married. In Egypt, FGM is part of the social and cultural aspects of the community (Zsabokorszky et al., 2023), with cultural ideals such as the cleanliness of the organs, which is also true in Ghana (Sakeah et al., 2018). There is evidence in some studies in Bawku-Ghana that has highlighted the deep cultural and social drivers of female genital mutilation (Sakeah et al., 2018). Women are urged to honour the family via virginity, control of sexuality, and fidelity among married women (UNICEF, 2022). It also confers eligibility for marriage in some communities. The prevalence was previously 15-17%. It declined to an estimated 61% in 2014, with numbers likely to reduce more due to a

change in mothers' attitudes towards the circumcision of their daughters. In one study, about 36% of girls were expected to undergo FGM, 16.4% had undergone the practice, over 80% of women and men believed that the practice would continue, 70% of both genders perceived FGM as a religious obligation, and husbands preferred a wife who had undergone circumcision in 80% of the cases (Aziz et al., 2022).

According to Nordmann et al. (2022), Sande is a social organization primarily comprising women. Based in Liberia, the society is believed to influence countries like Sierra Leone, Guinea, Cote d'Ivoire, and Ghana. Sande is an organization of interest in the study in Ghana because there has been an influx of Liberians in Ghana. Many Liberians fled to Ghana and sought asylum (Crawley & Fynn, 2022). Hence, knowing about the activities of Sande across Africa can help in the fight against the practice of female genital mutilation. Anthropologists have estimated that the activities of Sande date back to the 17th century (Tarr-Attia et al., 2019). They also mentioned in their study that the activities of Sande, such as the promotion of FGM, are still thriving despite government efforts to ban them.

Sande represents a powerful institution comprising only women who play educational, social, political, and economic roles in Liberia. Its initiation ceremony is type 1 FGM (clitoridectomy), which has been practiced for centuries (UNICEF, 2022). Girls are initiated during puberty and participate in the group throughout their lives. The group advocates for secrecy in their organizational activities, including rituals (Nordmann et al., 2022; Tarr-Attia et al., 2019). Discussing the group publicly can be seen as questioning its legitimacy, influence on the community, and teachings. The group

is robust to the extent that politicians are afraid to lose their traditional electorates by highlighting Sande in public (Tarr-Attia et al., 2019). The procedure is not seen as only circumcision but is considered entering into a powerful group. The reasons for the practice are to eliminate the sexual desires of a woman and to prevent extramarital sex. The teachings of Sande reinforce the gender roles of women as subject to the man's sexual needs. Women are expected to submit to their husbands and tend to have unaddressed problems related to intimacy or sex (Tarr-Attia et al., 2019). Girls in Liberia must join a secret society (Sande) to undergo FGM with repercussions for talking about the event. The prevalence lies at 38.2% for women between fifteen and forty-nine years old (UNICEF, 2022). However, the prevalence is highest in the North-Central (54.2%) and North-Western (68.3%) regions of Liberia (Nordmann et al., 2022).

Factors Driving FGM Practice

Various structural, community, familial, and individual factors are determinants of FGM (El-Dirani et al., 2022). Living in urban areas and higher parental educational attainment plays protective roles (Njue et al., 2019). Factors linked to FGM include the Muslim religion, history of FGM within the family and acceptance of FGM along cultural/religious lines, low educational attainment, poor wealth index status, and young age (Yussuf et al., 2020). Besides, there is a geographical variation in the type of FGM practice in Africa. The facilitators are shared across countries. FGM is associated with socio-economic determinants and sociocultural drivers such as occupational status, marital status, mothers' ages, residence and neighborhood, maternal educational level, wealth index, and media exposure (Ahinkorah et al., 2020). A fundamental determinant

of the FGM practice is gender stratification, and addressing the problem must start with social change that advances gender development (Akweongo et al., 2021).

Cultural Factors

Sakeah et al. (2019) provided a conceptual model for understanding the reasons for FGM in Pusiga District and Bawku Municipality. The factors promoting the continuation of FGM are historical traditions, customs, and religion. The practice is thought to preserve the virginity of women and control promiscuous behavior since the clitoris is believed to induce aggressiveness and ensure societal norms and values where patriarchy subjugates women (Sakeah et al., 2018). Women appear to have a role and orient their daughters to the practice of marriage suitability and social acceptance among their peers. Besides, these regions' lack of female autonomy and male dominance is believed to advance FGM (Sakeah et al., 2019).

Similarly, El-Dirani et al. (2022) reported that FGM results from complex, interrelated factors related to gender norms. These social norms guide behavior by setting punishments, benefits, or perceptions. Women have societal pressure to continue the practice, and stopping it is met with rejection, shame, and stigmatization (Sakeah et al., 2018). Besides, men have considered it a societal obligation, while others have mixed perceptions about its discontinuation (Coll et al., 2022). Religious views have also influenced it, as many communities perceive it as a societal obligation. It is also a requirement for marriage (Yussuf et al., 2020). This ritual has been passed down across generations for sociocultural purposes.

Socioeconomic Factors

In Sierra Leone, Ameyaw et al. (2021) established that women who had no formal education were aged 45-49 years, and poor women were more likely to circumcise their daughters than those who were educated, younger, and wealthy. Ahinkorah et al. determined that FGM was associated with the household wealth index. Those from the poorest quartiles were likelier to undergo FGM than women from the wealthiest quartile and their daughters. The study indicated that women with higher educational levels were less likely to undergo FGM than their counterparts. Married women and their daughters had higher chances of undergoing the ritual. Besides, FGM was associated with increasing age and rural neighborhoods. Sakeah et al. (2018) established that FGM was practiced in Pusiga District and Bawku municipality predominantly among women and girls from low socioeconomic status. Factors associated with FGM in Bawku and Pusiga districts include the age of 35-49, being married as opposed to single, widowed, or divorced women, and having no education or primary education (Sakeah et al., 2018).

In Tanzania, Suleiman et al. (2021) observed the mean age of those reporting FGM to be highest in those >35 years (25.3%), followed by the age group 30–34 (24.7%) and 25–29 at 22.7%. Furthermore, the majority of participants who had undergone FGM reported primary school education (72.8%), self-employment (70%), and resided in rural settings (62.9%). The other factor linked with FGM was tribe; the prevalence was highest among the Maasai, Pare, and Chagga tribes (Suleiman et al., 2021). While a majority of community members were ready to subject their daughters to FGM in the future, women tend to select a less severe type of mutilation acceptable within the community (Yussuf et

al., 2020). Elsewhere, Pastor-Bravo et al. (2022) examined the factors associated with the continuation and promotion of FGM in Spain and what causes changes in attitudes that make women oppose the practice. The study sampled 24 women from Murcia (Spain) who were immigrants from sub-Saharan Africa. Pastor-Bravo and peers reported that attitudes toward FGM, lack of knowledge, and pressure from the family were associated with support of FGM practice. Factors that motivated changes in attitude were growing awareness of women's rights, increasing awareness and reflection on adverse health consequences, negative personal experiences, breaking taboos (going against social expectations), and supporting legislation (Pastor-Bravo et al., 2022).

Aziz et al. (2022) reported factors linked to FGM in Egypt to living in a rural area, being from the poorest wealth index, and parents' attitudes supporting FGM. The data was retrieved from the Egypt Health Issues Survey (EHIS), which sampled 614 villages, collecting descriptive statistics of participants' responses (4,406 mothers, 3,787 fathers, and 5,272 adolescent girls 1–14 years). Rejecting gender violence was least likely to be associated with FGM practice, with more tendencies towards medicalization, a practice in which health professionals carried out FGM in the hope of preventing complications. Factors influencing attitudes towards FGM in Egypt included the social environment of the individual, influences, and sources of status, leading to unequal chances for various communities to change attitudes regarding FGM (Zsabokorszky et al., 2023). Females required the support of their husbands, and without it, they could not sustain the community's pressure, ending up circumcising their daughters (Aziz et al., 2022).

In Nigeria, Anyanwu et al. (2022) reported the predictors of women circumcising their daughters included culture, having a circumcised mother, being a traditionalist, low levels of educational attainment, being Muslim, and ignorance of the emotional, social, or psychological effects of FGM. The leading factor contributing to the decision of the mother to circumcise their daughters relates to the mother's experience and educational level. The Nigerian culture is highly associated with the Islamic faith but deeply rooted in cultural practices and beliefs. The FGM prevalence rate was higher among the Igbo and Yoruba tribes than the Hausa tribes (Anyanwu et al., 2022).

One factor supporting FGM in Liberia is the symbolic effects of women joining Sande, a powerful institution (Nordmann et al., 2022). The promoters of Sande include older women, supported by household males who contribute resources. Sande is a famous women's initiation society that advocated FGM. Sande administers FGM as part of their initiation ceremonies. Parents support their girls joining Sande to gain the community's respect. The abandonment of the practice is driven by access to communication technologies, information, and migration to urban regions (Tarr-Attia et al., 2019).

FGM in Ghana is linked to region, area of residence, age at first marriage, health insurance coverage, ethnicity, functional difficulty, and wealth index quintile. In the study by Alhassan & Anyinzaam-Adolipore, those from rural areas were three times more likely to engage in FGM than urban women. Women from Upper West regions were more likely to engage in FGM than those from Western regions. Tribes that predicted FGM were the Mole-Dagbani, Guan, Gruma, and Grusi. Marriages below 15 years also predicted FGM. Also, women with higher educational levels and richer wealth

index quartiles were less likely to engage in FGM practices (Alhassan & Anyinzaam-Adolipore, 2021). Akweongo et al. (2021) examined the gender dynamics influencing decision-making among several family members from a population of male social leaders and reproductive-age women from the Kassena-Nankana district in northern Ghana utilizing 22 focus group panels. Participants expressed that a daughter's mother was primarily responsible for encouraging her child to be circumcised and had a more influential impact. The father's role is outlined as permitting the procedure. The focus group discussion outlined that mothers were influenced by decisions to maintain tradition and patriarchal influence.

Another study by Sakeah et al. corroborated these findings. The cross-sectional study sampled women of reproductive age (15–49). Among 830 women sampled from Ghana, 61% had undergone FGM, and the mother influenced about 68% of those who underwent circumcision. Women residing in the district of Pusiga and without primary education were more likely to have undergone FGM compared to those aged 15-24 residing in Bawku. Married women were more likely to be circumcised. Women indicated that the practice could be stopped through health education. In contrast, Al Awar et al. (2020) sampled 1035 participants (80.3% females and 19.7% males) from Al Ain, Abu Dhabi City, UAE, indicated that 72.8% of participants did not support FGM, 69% considered it a custom, whereas only 17.4% considered it illegal. In addition, one-fifth of male participants indicated plans to circumcise their daughters.

Elnakib and Metzler (2022) argued that humanitarian emergencies affect girls and women disproportionately due to the breakdown of families and disruption of networks

which exacerbate gender-based violence and gender inequalities. The scoping review examined FGM in humanitarian settings. Findings indicated that humanitarian emergencies had context-specific and multifaced impacts on FGM. Human social norms may weaken or change migration causing the practice to decrease or increase. These migrations can make the type of FGM practice less radical (Elnakib & Metzler, 2022). Displacement and crisis can change, attenuate, or exacerbate the drivers of FGM. Where FGM is not a common practice, participants have indicated varying knowledge and attitudes, including unfamiliarity with FGM's health and legal implications. Larson et al. examined attitudes toward FGM among English-speaking immigrant adult women and men across two hospitals in London. Of the 54 participants, about 89% reported that the practice should be stopped, while 72% indicated that it is illegal in the UK. About 15% were unaware of the health dangers of FGM or perceived that it caused no harm.

Adverse Outcomes

The adverse effects of FGM include obstetric problems, psychosocial impacts, and adverse effects on sexuality (Pastor-Bravo et al., 2022). The consequences vary depending on the individual woman. The identified health dangers of FGM include genitourinary infections, HIV/AIDS, pain, fever, excessive bleeding, fistula, difficulty urinating, disfigured vaginal area, and death (Turkmani et al., 2019). Other consequences include diminished sexual pleasure, painful sexual intercourse, lack of sensation during intercourse, and a high risk of mortality and morbidity during pregnancy and childbirth (Elnakib & Metzler, 2022). Beyond detrimental health effects such as death, urinary problems, hemorrhage, and childbirth complications, FGM can result in poor social well-

being (Obiora et al., 2020). FGM negatively affects girls' productivity and school attendance, and it has been linked with high school dropouts due to early marriages. By causing health complications, FGM increases absenteeism at school and dropouts. Pallitto and Ahmed (2021) also stated that the status of FGM can affect how women interact with community members, family, and society in areas with high prevalence rates. In areas where the status of FGM of the woman deviates from social norms, it can affect how she fits into society and cause psychologically abusive behaviors, social isolation, and stigma, leading to adverse psychological and physical outcomes and altered health-seeking behavior.

Infibulation can constitute about 15% of the cases (Farouki et al., 2022). Some populations cut the labia and suture the vulva to allow a small orifice for menstruation and urination, which is associated with vaginal problems such as infections, discharge, menstrual problems, swelling of genital tissue, excessive bleeding, and difficulty in childbirth (Nonterah et al., 2020). The FGM procedure may need to be cut open later to allow for childbirth or sexual intercourse. In certain populations, the woman undergoes re-infibulation after delivery. The long-term risks of repeated opening and closing procedures cause psychological problems (Dilbaz et al., 2019). The adverse health consequences include poor psychological well-being, psychological trauma, and post-traumatic stress disorder.

Some studies have reported adverse obstetric outcomes among mothers who are FGM survivors. Nonterah et al. examined the factors associated with stillbirths in a district hospital in rural Northern Ghana. Of 16,670 deliveries from 2003-2013, 3.4% of

stillbirths were recorded. FGM survivors had increased odds of stillbirth compared to mothers who had not undergone FGM. Public health interventions that address stillbirths should focus on abandoning cultural practices (Nonterah et al., 2020). The health-related problems of FGM reported in Nigeria included scarring, tissue damage, infertility, painful menstruation, intercourse, and urination (Anyanwu et al., 2022). Women who underwent FGM are linked to increased odds of longer hospital stays, post-partum hemorrhage and undergoing cesarean delivery. FGM was also a predictor for episiotomy. Women who had undergone FGM were at increased risk of delivering infants with low Apgar scores at the 5th minute and a higher risk of neonatal death in the perinatal period (Suleiman et al., 2021).

Similarly, in Ghana, mothers who had undergone FGM had increased odds of stillbirths, undergoing cesarean delivery, four-fold risk of post-partum hemorrhage, two-fold risk of undergoing episiotomy/lacerations during the delivery, and were subjected to extended hospital stays (Nonterah et al., 2020a). In a qualitative study to uncover the health implications of FGM, midwives from Liberia reported that clitoridectomy was associated with prolonged labor and severe bleeding (Tarr-Attia et al., 2019).

Health Care Provider Attitudes and Knowledge of FGM

Women who have undergone FGM have varying health and sociocultural needs (Turkmani et al., 2019). They often deal with anxiety, stigma, and fear. After resettlement, they may struggle with present and past ways of life and often seek support in healthcare facilities. The systematic review by Turkmani et al. (2019) exploring the needs of migrant women who have undergone FGM and receiving maternity care

revealed that participants lived with fear and had undergone discrimination, stigma, and anxiety. After resettling and looking for support in healthcare facilities, the participants were dealing with their present lives. Identification of these needs will improve maternity care for such women.

Several challenges to providing healthcare to migrant populations include cultural differences, language barriers, and insufficient time to manage complex needs (Elnakib & Metzler, 2022). Healthcare providers are unfamiliar with the cultural factors involved in FGM. The barriers at the individual level include missing provider competency regarding uncertainty in managing a patient and talking to women/girls who have undergone FGM (Yussuf et al., 2020). Balde et al. (2022) conducted a mixed methods study, administering 150 questionnaires to healthcare providers followed by discussion within eleven focus groups. Findings indicated that about 24% of providers reported a lack of requisite knowledge and skills to provide quality FGM-related care. Healthcare providers (HCPs) reported limited knowledge of managing complications, particularly managing cases of infibulation. System-level impacts include failure to integrate models that deal with the care of FGM in routine practice (Balde et al., 2022; Evans et al., 2019a). Dawson et al. (2022) conducted a scoping review, identifying information about FGM-related care guidelines in high-income countries. The study included 124 documents, with 2 from Ireland, 20 from Australia, 2 from New Zealand, three from Canada, and 88 from the United Kingdom. Most documents highlighted communication skills, providing accurate information to clients, and being respectful and interdisciplinary care. Only 15 out of 124 documents included patient-centered care principles.

There is little formal education regarding FGM in midwifery, nursing, or medical schools (Berg et al., 2017). International migration patterns have increased the likelihood of healthcare providers in high-income countries coming across women who have undergone genital mutilation requiring medical care (Evans et al., 2019a; Turkmani et al., 2018). Assessment of provider knowledge and attitudes will have future implications for education.

Some studies have captured misunderstandings of FGM, supporting the need to educate providers. Turkmani and peers (2018) used a self-administered descriptive survey to explore the needs, experience, and knowledge levels of midwives in Australia regarding the care of patients who have undergone FGM. Of 198 sampled midwives, 24% did not understand the classification of FGM. About half reported having received formal education on FGM during their education. However, most reported that they did not understand the referral paths for such women. Furthermore, most participants reported being unfamiliar with health data and laws related to FGM. Correa & Báez evaluated the attitudes, knowledge, and practices of FGM among healthcare providers (midwives, nurses, gynecologists, pediatricians, and family doctors) in Tenerife. About 19.7% of the healthcare providers in the study reported an encounter involving an FGM case, 15.5% knew the countries with high prevalence, and only 26.8% reported the correct typology. While only 19% claimed to have received training on FGM, about 6.3% claimed knowledge of a protocol of action (Correa & Báez, 2021). González-Timoneda et al. surveyed the practices, knowledge, attitudes, and perception of FGM among primary HCPs (social workers, nurses, midwives, pediatricians, gynecologists, and general

practitioners) in a clinic in Valencia, Spain. Of 321 HCPs, less than 5% had encountered an FGM case in their professional practice, while 21.8% reported having worked with populations at risk of FGM. Only 15% had received FGM training, 22.7% identified typology and only 5% identified the correct geographical area. Besides, only 6.9% of the participants claimed to be aware of action protocols related to FGM care (González-Timoneda et al., 2018). Molina-Gallego et al. conducted a similar study sampling 1,168 HCPs (family doctors, nurses, pediatricians, gynecologists, and midwives from the five provinces of Castilla-La Mancha (Toledo, Guadalajara, Cuenca, Albacete, and Ciudad Real), Spain. About 13.9% received FGM training, 33.9% indicated they knew the legislation of FGM, 10.7% could identify the correct classifications, 8.64% knew protocols, and only 4.4% had encountered a case of FGM.

Similarly, Levy et al. (2021) administered a voluntary survey to healthcare providers on FGM at institutions based in Philadelphia. The findings indicated that 61.2% of the providers reported having encountered a case of FGM at least once in the past five years. About 13.7% reported having no formal education regarding the care of such patients. About 47.1% felt uncomfortable serving FGM patients, while the majority (77.5%) felt unprepared to cater to such patients. Besides, only 34.1% identified the matriarchal influence on FGM. The majority identified long- and short-term consequences of FGM, while about 68% reported being unfamiliar with laws surrounding the practice. However, the providers' attitudes indicated they perceived the practice as rooted deep in tradition and harmful. Nordmann and colleagues (2022) examined whether a workshop for training healthcare workers can improve knowledge, skills, and attitudes

in providing FGM care. The researchers conducted a training program encompassing obstetric, sexual, and psychosocial care for survivors of FGM. Of 34 male and 99 female HCPs, a significant percentage of trainees perceived FGM as a violation of women's rights and accepted to change their practice to meet the needs of survivors. About 83% perceived a role in advocating against FGM, while 10% indicated that traditional circumcisers should be trained on safe FGM practice. Pre-training knowledge levels were higher among physician assistants than midwives and nurses. The program increased HCPs' knowledge of FGM and attitudes. The HCPS indicated a willingness to implement guidelines when caring for survivors (Nordmann et al., 2022). This is valuable and provides insight into future workshops to accelerate guidelines in caring for FGM survivors.

From the literature, there is an inadequacy of studies that have assessed the knowledge and attitudes of providers in high-income countries and other areas regarding their ability to care for women who have undergone FGM. This hinders the provision of culturally competent care suitable to address the unique needs of such women. The gaps in skills and knowledge adversely impact the timely identification of needs and affect the management of FGM (Evans et al., 2019a; Evans et al., 2019b; Levy et al., 2021; Turkmani et al., 2018). Lack of training leaves providers unprepared and uncomfortable handling patients who have undergone the practice.

Role of Health Care Providers in FGM

Women are increasingly seeking surgical interventions for concerns related to FGM (Dilbaz et al., 2019). Healthcare providers have a role in providing information to

women seeking surgical interventions for FGM. Berg et al. (2017) revealed three types of surgical interventions-reconstruction for the clitoris and labia, defibulation, and excision of a cyst which can be accompanied by reconstruction. The motivations for seeking care in healthcare facilities include identity recovery, sexual aspirations, and aesthetic reasons. Women may seek deinfibulation to enhance the vaginal appearance and function and for sexual pleasure (Berg et al., 2017). The reasons supporting cyst excision include cystic swelling. The motivations for a clitoral appearance include identity and sexual pleasure. The motivations vary based on geographical locations, with women residing in the West stating the motivations for esthetic improvement and identity restoration. Deinfibulation was associated with easier childbirth, and most women are satisfied with such surgeries (Berg et al., 2017). Those undergoing reconstruction have also reported high levels of satisfaction.

The perception of esthetics is for sexual satisfaction and physical beauty. A case study by Dilbaz et al. (2019) indicated that when HCPs provide information about surgeries, women are empowered to make informed decisions about them. FGM victims should receive multidisciplinary counselling explaining the risks and possible outcomes. This underpins the importance of HCPs in sexual counselling, supportive psychotherapy, counselling for defibrillation, and non-surgical alternatives. Adogh et al. (2021) conducted a systematic review of the knowledge, experiences, and attitudes of HCPs in sub-Saharan countries, illuminating critical cultural issues, inadequate opportunities for training, and lack of skills and knowledge among HCPs. The delivery of educational

workshops and training can aid in creating awareness and changing the attitudes of healthcare professionals in sub-Saharan countries.

Studies have limited information on the availability of clinical guidelines and policies related to the lack of adherence to guidelines and poor implementation of evidence-based materials related to the care of FGM survivors (Adogho et al., 2021). However, HCPs need the training to decline requests to perform FGM and care for the needs of women and girls who have already undergone FGM. Facilities that lack continuous professional development on FGM should include them within their programs. Also, professional healthcare bodies can utilize standardized training to enhance knowledge of FGM, skills, and attitudes among its members.

Medicalization of FGM

FGM is routinely performed by traditional practitioners such as birth attendants or circumcisers (Seidu et al., 2022). Traditional practitioners can use razors or blades to make the FGM cut. They rarely have the training to treat the health consequences of FGM, infection prevention and control, or knowledge about the physiology and anatomy of the human body (Doucet et al., 2017). FGM has been medicalized over the past few decades (Obiora et al., 2020). The WHO defines medicalization, whether at home, in private clinics, or in public hospitals, which involves any FGM, re-infibulation, or other FGM-related procedures performed by nurses, medical doctors, midwives, or other healthcare providers (WHO, 1998). As a result of increased awareness of the short-and long-term dangers of this practice, many healthcare providers have stopped performing FGM, hoping that it can decrease the likelihood of adverse health outcomes (Al Awar et

al., 2020). However, FGM still poses risks even if performed with trained providers using sterile equipment. The removal of a body part can result in adverse outcomes. The practice is performed for sociocultural reasons and contravenes medical ethics and rights such as non-maleficence and the rights of women to health, physical integrity, and health (Doucet et al., 2017). When healthcare providers are involved in FGM, community members can perceive that the practice is safe and acceptable, further advancing FGM (Evans et al., 2019b).

Several studies have reported FGM medicalization. Al Awar et al. (2020) reported that FGM was performed by ritual circumcisers predominantly but was also performed in the clinic (36.7%) or by healthcare professionals (25%) in the United Arab Emirates. The findings established that a quarter of women had undergone circumcision in private clinics conducted by a healthcare professional. Only a third of the cases were conducted within a sterile/clean environment. Subsequently, daughters of mothers who had undergone FGM embraced FGM performed by professionals and clinics (Al Awar et al., 2020). In Guinea, about 59% of the cases were performed traditionally using traditional tools such as knives or razors, while up to 35% were performed by a healthcare provider (Balde et al., 2022). In another study that sampled midwives in Australia, about 8% were requested to perform FGM (Turkmani et al., 2018). Medicalization of FGM has increased steadily in Egypt to about 74% of the cases due to the community's perception that it will decrease adverse outcomes such as infections and bleeding and limit pain while meeting the cultural expectations of the community. It was common among educated and rich

parents and families that rejected violence against women (Aziz et al., 2022). The wealthy in society are gradually resorting to medicalized FGM.

To decrease the medicalization of FGM, it is essential to identify healthcare providers' motivations. Some studies have outlined the reasons why HCPs support medicalization. An integrative review by Doucet et al. (2017) reported the medicalization of FGM to understand the motivations of health providers in conducting FGM at the request of families among immigrant populations or in areas where FGM was prevalent. Motivations were based on the belief of less harm for women, being better alternatives to traditional practitioners, justification of the practice based on cultural arguments, financial gain, and pressure from the community. Reasons for not performing FGM based on HCPs included concerns about the risks of FGM to women and girls' health, perception of the practice as evil, and preoccupation with legal consequences (Doucet et al., 2017). Factors supporting FGM medicalization among medical providers in Guinea included perceived harm reduction, cultural pressure to maintain the tradition, financial incentives, and support for the practice (Balde et al., 2022). (Yussuf et al., 2020) conducted a cross-sectional qualitative study examining the healthcare system's capacity in Somalia to manage FGM complications and prevent its medicalization. The study sampled 20 healthcare providers and established that healthcare workers faced multi-layered contextual challenges such as a lack of training and information on the prevention and management of complications and medicalization of FGM, poor funding and lack of equipment in facilities, and lack of policies against medicalization at the national level. Somaliland lacks a legislative framework against FGM or its medicalization, with a lack

of political commitment after disagreements from religious bodies (Yussuf et al., 2020). Policies targeting the protection of human rights and prevention of medicalization of FGM hinge on religious support.

Adogho et al. (2021) argued that cultural affiliation was the key determinant for positive attitudes favoring FGM in sub-Saharan countries. This underlines that training alone cannot be adequate to change the attitudes of healthcare professionals or the medicalization of FGM in sub-Saharan countries (Al Awar et al., 2020). The practice must be seen as something deeply embedded in culture because the surrounding communities performing FGM conduct it for cultural purposes. Thus, HCPs from regions where the practice is still prevalent are likely to be influenced by the cultural foundations of the practice. The cultural identity places a dilemma between professional practice and the local community. This danger can be attributable to bias in attitudes, knowledge, and FGM-related care (Pallitto & Ahmed, 2021). In addition, a conflict of interest may be presented between upholding cultural practices and beliefs versus professional ethics.

This literature review highlights that the medicalization of FGM results from social norms and cultural practices, the need to satisfy the demand, reducing harm to patients, and financial motives to supplement income. Regardless, healthcare providers performing FGM are perpetuating a harmful practice, violating the ethics and rights of girls and women, and contravening stipulations from professional ethics.

Approaches to Mitigate FGM

This review has indicated that FGM is prevalent in northern Ghana, particularly in Bawku municipality and sub-Saharan Africa. Urban status is a crucial protective factor

for women despite the lag between some urbanized cities in gender equality. Urbanization appears to be associated with greater freedom for women to make specific choices. This is attributable to the impact of urbanization on women's empowerment via education, economic opportunities, and political empowerment (El-Dirani et al., 2022). This link between geographical location and the educational level of women also explains how urbanization contributes to gender equality and better well-being for women (Obiora et al., 2020). This review indicated that parental education was protective against FGM for girls and women across sub-Saharan Africa. This reflection indicates that education plays a role in women's autonomy, influencing their cultural outlook, social status, and ability to be independent and oppose traditions and gender roles. Conversely, the status of women in society, such as living in a village with high FGM rates, child marriage, low maternal educational status, and being an illegal immigrant, was associated with high rates of FGM (El-Dirani et al., 2022). Progress toward gender equality and inclusion of more women in places of education and workplaces was a pathway to end FGM (Obiora et al., 2020).

Advances in education have resulted in a decrease in FGM. Exploring attitudes regarding FGM among migrant community groups is crucial to protect girls and women from FGM (Larsson et al., 2018). In Sierra Leon, women with low educational attainment or from poor wealth indexes were more likely to circumcise their daughters in the future, highlighting the need for education to stop FGM (Ameyaw et al., 2020). The high persistent prevalence rates can be attributed to gendered cultural forces supported by the perceived benefits of FGM concerning marriage opportunities (Al Awar et al., 2020).

Since women with low educational levels and those from low SES had higher chances of intending to circumcise their daughters, formal education appears to be a critical step in ending the practice of FGM (Ahinkorah et al., 2020). Strengthened laws against FGM and policies targeting women from low socio-economic status with lower levels of educational attainment. Female education policies will aid this course (Ameyaw et al., 2021). In UAE, the absence of legislation has promoted the medicalization of FGM. Al Awar et al. (2020) call for legislation that criminalizes this practice and supportive educational programs and training programs that can be implemented as part of the national strategic plan in community settings, schools, religious centers, and universities to support the eradication of FGM. The maternal and neonatal outcomes associated with FGM can be used to create awareness of its deleterious effects, enabling communities to eliminate or decrease its practice (Suleiman et al., 2021). Turkmani et al. (2019) called for efforts to improve the quality of maternity care, demonstrating culturally safe woman-centered practice and building on mutual and therapeutic provider-patient relationships with cultural sensitivity. Besides, engaging women affected by FGM is crucial for developing women-focused policies to improve maternity care quality.

On the other hand, Ahinkorah et al. (2020) recommended multifaceted interventions to address FGM, such as education and advocacy efforts, peer-teaching, community dialogue, focus group discussions, mentorship programs at community/national levels, and women-capacity-building instruments such as entrepreneurial training. Njue et al. offered support to this approach through multifaced approaches encompassing community mobilization activities, environmental and physical

factors, socio-economic factors, learning and education, and utilization of healthcare facilities and services. Akweongo et al. (2021) determined that several factors impact decreasing prevalence of FGM, such as health concerns (childbearing, child health, and loss of blood), being ridiculed for circumcision, increasing preference for uncircumcised women, and horrific experiences by older women. These have strengthened the advocacy efforts against FGM. The author calls for marshaling women into advocacy and embracing openness to change to prevent FGM practices. In Liberia, advocacy for FGM abandonment is a sensitive issue that necessitates careful consideration of values. Sexual counseling training is fundamental. At the societal level, women must understand their sexual rights and body integrity and be counseled on the need for a pleasurable sexual life (Tarr-Attia et al., 2019). Midwives can be supported by training on the obstetric needs of FGM survivors and interventions to prevent complications. Community engagement by collaboration with Sande can explore introducing non-harmful approaches for membership into the Sande group to aid the abandonment of FGM.

Levy et al. (2021) indicated that misunderstanding the tradition and motives behind FGM among medical providers necessitates provider education to equip skills to provide culturally competent care to girls and women who have undergone FGM. To address educational/training gaps, it is imperative to educate midwives on the knowledge and clinical skills required to provide appropriate care to women who have undergone FGM (Turkmani et al., 2018). This will empower them to provide optimal care for this patient population, partner with communities to sensitize against FGM, and to assist with health service planning for their communities. Healthcare professionals are uniquely

positioned to work with communities to educate women and men to end this practice (Larsson et al., 2018). Women may benefit from a clear depiction of the benefits of not circumcising women (Sakeah et al., 2018). Economic empowerment of women is likely to alter their decision-making about FGM. Efforts to boost the economic empowerment of girls and women should ensure all girls reach tertiary education. Heath education programs designed to change attitudes about FGM should not only focus on adverse health outcomes. Still, they must highlight girl empowerment, support gender-sensitive and non-violent behaviors, and sociocultural needs to meet the needs of communities (Pastor-Bravo et al., 2022).

Aziz et al. (2022) recommended prioritizing men in efforts targeting FGM elimination, raising community awareness of girls' and women's rights, and enforcing laws against the medicalization of FGM by medical practitioners. By incorporating men and enhancing their role as fathers, husbands, or community leaders, they can support prevention and create an enabling environment to discontinue FGM (El-Dirani et al., 2022). Clinicians can embody person-centered care and shared decision-making to influence positive experiences. The inclusion of interpreters can solve language barriers. Lastly, with the unavailability of protocols and care pathways (Dawson et al., 2022), healthcare systems can develop guidelines for identifying and managing FGM, with subsequent implementation into routine practice. Healthcare systems must adapt and innovate to ensure processes and environments that support professionals to deliver appropriate and culturally sensitive care for patients who have undergone FGM (Evans et al., 2019a). In Guinea, strategies that focused on awareness were conducted by non-

governmental organizations, community donors, and other ministries. There was no program for FGM prevention encompassing the health sector (Balde et al., 2022). In Liberia, midwives expressed challenges such as a lack of skills for handling vaginal deliveries, working in isolation, and lack of access to training resources (Tarr-Attia et al., 2019). These findings implicate the need to target the health sector to eliminate FGM by building capacity, strengthening the health system, and teaching medical providers about medical ethics and human rights for those involved in the medicalization of FGM. There are opportunities to improve guidelines to recognize the needs of women and girls who have undergone FGM, develop therapeutic relationships, share decision-making responsibility, and provide person/patient-centered care (Dawson et al., 2022). The design of curricula to address FGM-related care can encompass girls or women at risk of FGM in designing tools and evaluating healthcare needs. HCPs were partners in girl-centered care. This requires efforts in capacity building of the health workforce, governance for policy resources, and supportive leadership for financial resources.

To address all areas, the health promotion approach must focus on collective activities within the community, such as public health interventions addressing social, medical, and cultural issues that are slowing efforts toward the abandonment of FGM (Evans et al., 2019b). Njue et al. recommended the utilization of Beattie's framework in health promotion actions, enhancing collaboration, synergizing communication between all parties, and ensuring community engagement to improve awareness of girls' rights, learning materials, protocols and guidelines, and effective data collection of women who have undergone FGM to ensure HCPs provide effective care to survivors. The health

system is a larger part of the social system, interrelated to other sectors in the community. It fits into the larger political, socio-economic, and development factors (Pallitto & Ahmed, 2021). These development factors include educational and literacy levels, maternal mortality rates, GDP spending on health and gender equality, and health indicators. These factors interrelate to the abandonment or continuation of the practice. Commitment from governments and political sectors influences an end to the practice by providing financial resources, criminalizing laws, and the utility of effective interventions to end the practice.

Findings addressed shortcomings in skill and knowledge related to FGM-related care and poor understanding of cultural sensitivity (Evans et al., 2019a). An approach to mitigate these challenges includes comprehensive training on cultural sensitivity embedded with FGM-related care. Evans et al. (2019b) highlighted experiences of survivors of FGM when accessing FGM-related care indicated challenges related to cultural dissonance and disempowering experiences, highlighting the need for a respectful, safe, and empowering holistic. The training of healthcare providers should cover communication around FGM, psychological needs, and clinical interventions. Correa and Báez evaluated attitudes, knowledge, and practices of FGM of HCPs in Tenerife and indicated a lack of knowledge of FGM practice, typology, countries performing it, and why it is undertaken. An increasing trend in the medicalization of FGM has prompted the WHO to stop providers from performing FGM by regulatory/legislative support, mobilizing political will and funds, strengthening

knowledge of medical providers, and via enhanced systems for accountability, monitoring, and evaluation (Balde et al., 2022; UNICEF, 2022).

Conclusion

The literature review gives several aspects related to female genital mutilation (FGM). It gives studies relating to FGM in Ghana and beyond, exploring factors relating to FGM like cultural and religious beliefs, gender and societal norms, as well as the knowledge and attitudes of healthcare providers towards FGM. It is estimated that the prevalence of FGM globally is at least 200 million women and girls across 31 countries (Farouki et al., 2022). FGM in Ghana is mainly practiced in the northern and Upper East regions, likely promoted by cultural and regional factors. The review acknowledges the continued practice of FGM in Ghana despite legal measures and efforts to eradicate it. It highlights the need for further research on prevalence rates and the impact on healthcare providers. Chapter 3 will focus on the research method, where the research design, rationale, methodology, and plan for data analysis are discussed.

Chapter 3: Research Method

This quantitative study examined the relationship between midwives' knowledge, years of licensure and attitudes toward FGM and the prevalence of FGM among their patients in Bawku, Ghana. This chapter outlines the study's procedures to achieve this objective. Furthermore, this chapter presents the rationale for the research design, including the identification of study variables, the research design employed, how it related to the research questions, and the significant limitations associated with the design. Chapter 3 also presents the study's methodology, target population, and how the data collection was conducted. Chapter 3 also contains a detailed description of the instrumentation, operationalization, and data analysis including the software used, the data cleaning process, and the statistical tests.

Research Design

The research questions for the study addressed whether there was an association between the knowledge of midwives about FGM and the prevalence of FGM among their patients, and whether there was an association between attitudes and years of licensure of midwives about FGM and the prevalence of FGM among their patients. The dependent variable of the study was FGM prevalence. FGM is prevalent in sub-Saharan Africa. Farouki et al. (2022) stated that more than 200 million women in 31 countries had undergone FGM, with media reports and unconfirmed evidence revealing that FGM may be prevalent in more than 90 countries worldwide.

I employed a quantitative cross-sectional design to meet the study's objective. The cross-sectional design was preferred because it allowed for collecting data at one

time point and allowed for prevalence calculations (see Setia, 2016). A questionnaire was administered to midwives to collect data on the midwives' knowledge and attitudes about FGM. The questionnaire was used to collect data to estimate FGM prevalence by asking the midwives the number of women who may have underwent FGM. This approach helped me to obtain data that could be analyzed through inferential techniques to determine the relationship between the knowledge and attitudes of midwives and FGM prevalence rates. A descriptive design is essential for an accurate sample population profile. In addition, the design can reveal other relevant characteristics of the phenomenon of interest. This design allowed me to obtain relevant data necessary for assessing the relationship between the knowledge and attitudes of midwives concerning FGM and the FGM prevalence rate.

I considered the FGM rate as the dependent variable, and the independent variables were midwives' knowledge, years of licensure, and attitude toward FGM in Bawku. The study also included age, ethnicity, and religion as control variables. The significant constraints consistent with this research design were the possible difficulties for midwives to freely give their views given that FGM is outlawed. I ensured that the participants understood the nature of the study by including a brief introduction before the survey. .

Rationale for Choosing a Cross-Sectional Design

The cross-sectional design was selected based on the design's suitability for investigating the relationship between the knowledge, years of licensure and attitudes of midwives about FGM and the prevalence of FGM among their patients in Bawku. This

design allowed for data collection at a specific point in time, thereby providing a snapshot of multiple variables in the study (see Kesmodel, 2018), which allowed me to investigate the relationship between these variables. The design is also relatively efficient and cost-effective (Wang & Cheng, 2020) compared to a longitudinal design. A cross-sectional design was also chosen for the current study because it had been described as one of the best designs in related studies (see Kesmodel, 2018). A cross-sectional design makes it easy for the researcher to collect data from a large sample in a short time frame. Another reason for choosing this design is that it is ideal for collecting self-reported data through questionnaires (Wang & Cheng, 2020), which provides a snapshot of participants' attitudes and beliefs. Finally, this design allows for exploring relationships between variables, thereby making it easier to obtain preliminary insights and generate hypotheses for further research.

Methodology

Population

The target population included midwives practicing in Bawku, Ghana. According to the World Health Organization (2023), FGM is mostly done between infancy and 15 years (Sabi et al., 2023). Jahangiry et al. (2021) noted that a substantial number of women undergo FGM after delivery, which midwives mainly conduct through a procedure commonly referred to as the medicalization of FGM. Midwives have the potential to promote FGM, which warranted the need to investigate the potential relationship between midwives' knowledge and attitudes and the FGM rate.

Population of Bawku

Bawku Municipality is a district in the Upper East Region of Ghana. The district is headquartered in Bawku Town. According to a recent housing and population survey, the municipality has a population of 98,538, with females (51,284, 52%) being slightly higher than males (47,254, 48%; Sakeah et al., 2018). Bawku Municipality is predominantly occupied by the Mole Dagbani group, with the major ethnic communities being the Kussasis, Mamprusis, Bissas, and Moshies (Tseer et al., 2022). The traditional and cultural ways have a heavy presence in this municipality district, with practices such as traditional male circumcision, FGM, and traditional marriages.

Midwives in Bawku Municipality District

According to Ghana Statistical Services, Ghana has more than 7,000 registered midwives providing primary care (Adatara et al., 2020). As per Adatara et al. 2020, there are also about 400 midwives in the upper east region of Ghana, from which the Bawku Municipal District has over 100 of them practicing in various hospitals and clinics. Midwives play a vital role in caring for and treating mothers and children during pregnancy and after birth. Midwives have broad roles involving education, treatment, and enhancing collaboration with different specialties to ensure adequate care (Kyei et al., 2023). Midwives are the primary HCPs who attend to pregnant women and are expected to identify and manage most ailments their patients present.

Sampling and Sampling Procedures

I obtained data by administering a questionnaire to a sample of midwives in the Bawku Municipal District. The critical data that the study addressed included (a) the

knowledge score calculated based on the FGM knowledge scale that was calculated based on a series of questions asking about different aspects of FGM; (b) the attitude score from the FGM Attitude Scale that was calculated based on series of questions asking about respondents' feelings about FGM; and (c) years of licensure, calculated from asking the midwives their years of practice (d) FGM prevalence, which was calculated based on the respondents' responses regarding the number of women they attended who underwent FGM. The questionnaire also elicited sociodemographic information about the respondents' age, sex, religion, and ethnicity.

To determine the sample size to be used, I applied the power analysis technique, which is a precision-based approach in which the calculated sample size confines the marginal mean outcome of treatment within a prespecified margin of error (Kang, 2021). The study was conducted at 80% power. The desired sample size was calculated using G*Power Version 3.1.9.7. Using the effect size of 0.15, error probability of 0.05, power of 0.08, and number of predictors of 1, I determined the needed sample size for the study was 55.

According to the Ghana Statistical Services, as reported by Adatara et al., 2020, the Bawku Municipal District has an estimated 130 registered midwives. Therefore, a minimum sample of 55 was considered acceptable for the study. I obtained a sample of 55 registered midwives working in Bawku Municipal District. Due to the limited population of midwives, the sample was drawn using snowball sampling techniques. Snowball sampling was used to identify midwives due to their relative scarcity, which made it difficult to use a pure probabilistic sampling approach.

Sampling Inclusion and Exclusion Criteria

For inclusion in the sample, a person was required to be a registered midwife by the Ministry of Health in Ghana and practicing within the Bawku Municipal District. The person was also required to give consent to participate in the study by signing the consent form. The exclusion criteria included health professionals who are not midwives, incomplete responses resulting from respondents dropping out without completing the survey, individuals who did not provide consent, midwives who were not practicing within the Bawku Municipality, and midwives who needed help understanding English because the survey was administered in English.

Operationalization of Constructs

I investigated the association between the knowledge, years of licensure, and attitudes of midwives and the FGM prevalence rate. I adopted operationalized variables developed by UNICEF (2020) to measure indicators relevant to eliminating FGM. Table 1 summarizes the operationalization of the variables.

Table 1

Operationalization of Variables

Variable	Category	Operational definition	Scale of measurement	Example
Demographics	Name of health facility	Name of the health facility attached to	Nominal	XX dispensary
	Age	Age of the respondent in years	Ordinal	30–34
	Ethnic group	Respondent's ethnicity	Nominal	Hausa/Mosi/Grusi
	Religion	Respondent's religion	Nominal	Christianity/Islam/ Traditional/others
	Number of years as licensed provider	Total years the person has practiced as licensed midwife	Ratio	5
Knowledge score (types of FGM)	Type 1 is partial or total excision of clitoris	Knowledge about FGM types	Nominal	Yes/no/don't know
	Type 2 is excision of clitoris and labia minora	Knowledge about FGM types	Nominal	Yes/no/don't know
	Type 3 is the excision of part or all of the external genitalia and stitching/narrowing of the vagina opening (infibulation)	Knowledge about FGM types	Nominal	Yes/no/don't know
	Type 4 is unclassified and refers to any other mutilation performed on the genitalia such as gishiri cut, piercing and massaging of any part of external genitalia	Knowledge about FGM types	Nominal	Yes/no/don't know
	Are all types of FGM dangerous?	Knowledge about FGM types	Nominal	Yes/no/don't know
Types of FGM complications	Hemorrhage	Respondent is aware of health effects of FGM	Nominal	Yes/no/don't know
	Difficult labor/childbirth	Respondent is aware of health effects of FGM	Nominal	Yes/no/don't know
	Genital tears during childbirth	Respondent is aware of health effects of FGM	Nominal	Yes/no/don't know
	Infections	Respondent is aware of health effects of FGM	Nominal	Yes/no/don't know
	HIV transmission	Respondent is aware of health effects of FGM	Nominal	Yes/no/don't know
	Infertility	Respondent is aware of health effects of FGM	Nominal	Yes/no/don't know
	Scar and keloid formation	Respondent is aware of health effects of FGM	Nominal	Yes/no/don't know
Attitude score	Is FGM an acceptable practice?	Respondent approves FGM	Nominal	Yes/no/don't know
	Does FGM prevent prostitution?	Respondent's perspective on misconceptions about FGM	Nominal	Yes/no/don't know
	Does FGM reduce sexual arousal?	Respondent's perspective on misconceptions about FGM	Nominal	Yes/no/don't know
	Does FM cause sexual dysfunction?	Respondent's perspective on	Nominal	Yes/no/don't know

		misconceptions about FGM		
	FGM makes genitalia more attractive	Respondent's perspective on misconceptions about FGM	Nominal	Yes/no/don't know
FGM prevalence	In the last 3 months, how many women/ girls aged 15 and above have you attended to?	Number of patients attended to	Scale	Number
	Of those you attended to in the last 3 months, how many have undergone FGM?	FGM prevalence	Ratio	Number

I also considered variables such as age, ethnicity, and religion as the control variables to adjust for the midwives' characteristics.

Data Analysis Plan

I followed processes to collect, clean, and analyze the data to obtain results to answer the research questions. The section includes the software applied, data cleaning and processing used, research questions and hypotheses, and how the data were analyzed and interpreted.

Software

Microsoft Excel software and Statistical Package for the Social Sciences (SPSS) Version 28 was employed to assist with data cleaning, preparation, and analysis.

Data Cleaning and Screening Procedures

The data were subjected to cleaning and preparation to ensure that they would produce reliable results. The data cleaning process involved discovering and correcting discrepancies, such as incorrect entries and duplicates. I looked for missing data, duplicates, and structural errors such as wrong entries.

Research Questions and Hypotheses

RQ1: Is there an association between midwives' knowledge about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion?

H_o1: There is no association between the knowledge of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion.

H_a1: There is an association between the knowledge of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion.

RQ2: Is there an association between the attitudes of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion?

H_o2: There is no association between the attitudes of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion.

H_a2: There is an association between the attitudes of midwives about FGM and the prevalence of FGM among their patients in the Bawku district of Ghana while controlling for age, ethnicity, and religion.

RQ3: Is there an association between years of practice and the prevalence of FGM in Bawku while controlling for age, ethnicity, and religion?

H_o3: There is no association between years of practice and the prevalence of FGM in Bawku while controlling for age, ethnicity, and religion.

H_a3: There is an association between years of practice and the prevalence of FGM in Bawku while controlling for age, ethnicity, and religion.

Analysis

Descriptive statistics was used to summarize the data and identify patterns and potential associations. Approaches such as cross-tabulation, frequency distributions, means, and standard deviations were used to get more insight into the distribution of the data points. The study also applied Pearson's correlation test to test for the association between the independent variables and the response variable, the FGM prevalence rate. The correlation test then was followed by a linear regression analysis that helped to infer the extent of knowledge, years of licensure and attitude about FGM on the FGM prevalence rate. The study was conducted at a significant level of 0.05, from which the p-value for knowledge, years of licensure and attitude was compared after a correlation test and linear regression analysis. The rejection/acceptance of the null hypothesis was based on a decision rule that the null hypothesis is rejected if the p-value is less than or equal to 0.05. Otherwise, I fail to reject the null hypothesis.

Linear Regression

The linear regression model is commonly utilized to model response variables in various scenarios, as many phenomena can be assumed to follow a normal distribution. Multiple linear regression also referred to as multiple regression, is an analytical technique that permits the modeling of multiple explanatory variables to forecast a

response variable. In this specific case, the study modeled two explanatory variables, namely the knowledge and attitude of midwives, to predict their impact on the FGM prevalence rate.

Multiple regression models can be expressed using the equation below.

$Y=\beta 0+\beta 1\ X1+\cdots+\beta n\ Xn$

Where:

Y is the response variable

β0 is the intercept of the model.

βi's are the coefficients of the explanatory variables.

Xi's are the explanatory variables.

Based on this, I fitted the variables to the model, as show below:

1. Model with Knowledge and control variables

FGM prevalence= β0+β1*Knowledge+ β2*age + β3*ethnicity+ β3*religion+ β3*licensure

2. Model with attitude and control variables

FGM prevalence= β0+β1*attitude+ β2*age + β3*ethnicity+ β3*religion+ β3*licensure

3. A simple regression Model with FGM prevalence as the dependent variable and years of practice as independent variable

FGM prevalence = β0+β1*licensure

Assumptions of Multiple Linear Regression

To validate that the multiple regression model is appropriate for our study, I first evaluated key assumptions, like the existence of a linear relationship between the

independent variables and response variable, equal variable of the error term, normality of the error terms, and multicollinearity assumptions. The rationale for choosing multiple linear regression analysis was based on its ability to measure the relationship between one continuous response variable and a set of independent variables (Valentini et al., 2021).

Threats to Validity

Threats to External Validity

Threats to external validity refer to the extent to which the findings of a study can be generalized to a larger population or different settings (Bo & Galiani, 2021). In our study design, some potential threats to external validity are:

1. Selection Bias: The sample used in the study may not be representative of the entire population of midwives or the FGM prevalence rate. To address this, using a sample of 55 midwives in a population of about 130 is large enough to increase the generalizability.
2. Maturation: Changes in participants over time may influence study outcomes. I addressed this by controlling sociodemographic variables.
3. Instrumentation: The accuracy and consistency of the measurement tools used in the study may affect the results' reliability. To address this, the questionnaire was an existing validated questionnaire extracted with permission from the Onu et al. study.

Threats to Internal Validity

Internal validity refers to the extent to which the study design controls unnecessary variables that may affect the study's outcomes (Patino & Ferreira, 2018). Some potential threats to internal validity in our study design are:

1. History: Events that occur during the study period, such as changes in FGM prevention policies or programs, may influence the study outcomes. To address this, the study employed a cross-sectional design that ensured that data were collected within the same time frame, hence limiting the chances of events that may significantly affect internal validity.
2. Selection bias: Participants may not be representative of the target population. To address this, the study applied randomization to select participants to reduce selection bias and increase the likelihood that the sample being representative of the population being studied.
3. Repeated measures of the same variables may influence participants' responses. To address this, the study changed the order of questions in these areas for different respondents.

Threats to Statistical Conclusion Validity

Threats to statistical conclusion validity refer to the extent to which the study's conclusions can be linked to the independent variable rather than chance or other factors (Bo & Galiani, 2021). Some potential threats to statistical conclusion validity in our study design were:

1. Sample size: A small sample size may limit the generalizability of the study findings. To address this, I raised the power of the test through power analysis to obtain a sample size that is sufficiently large.
2. Measurement error: Inaccurate or imprecise measurement tools may affect the study's outcomes. To address this, the researcher used an existing validated questionnaire in the survey.
3. Confounding variables: Other variables that are not measured or controlled may affect the study outcomes. To address this, the study employed multiple linear regression with controlling variables to control for sociodemographic variables.

Ethical Procedures

In conducting the study, several ethical procedures were adhered to, including:

1. Informed consent: Participants were provided with information about the study's purpose, procedures, and risks, and their consent was obtained before their participation. I ensured that the consent forms are presented for them to read and understand before deciding to participate.
2. Confidentiality: Participants' personal information and responses were treated as confidential and anonymous.
3. Voluntary participation: Participants only participated in the survey upon giving consent. No participant was coerced to participate in the study, and they had the right to drop out of the study at any time. They also had the right to provide answers to only questions they feel like providing answers.

4. Risk minimization: The study was designed to minimize potential harm or discomfort to participants. Therefore, the study restrained from asking questions that may have sounded like a direct attack on the respondents.
5. Data protection: Appropriate measures were taken to ensure the security and protection of the data collected during the study. All data collected from the respondents were strictly used for analysis only.

Overall, the study followed all the standard ethical guidelines and procedures in research to ensure the participants' protection and well-being and the research process's integrity. Walden University's IRB approval number for this study was 10-18-23-0747847.

Summary

This chapter thoroughly explains the research design and methodology to provide a clear understanding of the approach taken. The research approach was quantitative, which involved gathering cross-sectional data from Bawku midwives. A snowball sampling technique was used to administer questionnaires to ensure the accuracy and representation of the sample. The data collected was then cleaned and prepared for analysis using SPSS software. The inclusion and exclusion criteria were determined based on the participants' profession as midwives and their practice area. The collected data was further cleaned before conducting various statistical analyses such as descriptive statistics, cross-tabulation, correlation tests, and multiple linear regression analysis. The chapter also addresses potential threats to the study's internal and external validity and

how they were effectively mitigated. Finally, the chapter discusses potential threats to construct or statistical conclusion validity.

Chapter 4: Results

In this chapter, I discuss the results and insights derived from the examination of the relationship between knowledge, years of licensure, and attitudes of midwives about FGM and the rate of FGM in Bawku, Ghana. This chapter gives a clear view of how empowering midwives with relevant knowledge, as well as changing their attitude toward FGM, can be instrumental in the fight against FGM by employing quantitative data collection and leveraging different analyses. The interpretation of the study findings offers an extensive view of the significant role that midwives can play in the fight against FGM. This chapter is relevant in understanding the relationship between midwives' knowledge and attitudes and FGM prevalence through the presentation of the analysis findings. This study promotes the enhancement of existing knowledge in academic and practical contexts.

Demographic Information

I employed different analysis approaches to examine the phenomenon under study. First, I employed descriptive analysis to describe vital demographic characteristics of the sample, such as age, religion, ethnic group, years as a licensed midwife, number of girls attended to, and number of patients who underwent FGM. Measures such as mean, standard deviation, and minimum and maximum observations were used to summarize the continuous variables, while frequency distribution tables summarized the categorical variables. Tables 2, 3, and 4 provide summaries of demographic information about the sample.

Table 2

Age and Experience Level Distribution for Sampled Midwives

Variable	*N*	*M*	*SD*	Min	Max
Age	55	33.5	8.7	23	56
Number of years as licensed midwife	55	6.2	2.99	1	11

Table 2 presents statistics giving insight into the midwives' ages, experience, number of women attended to, cases of FGM, and knowledge and attitudes related to their profession. From the table, I established that the sampled midwives' ages ranged from 23 to 56, with an average age of 33.5 years, with a spread of 8.7 standard deviation around the mean. The midwives had been licensed for an average of 6.2 years, with a standard deviation of 2.99. The range was from 1 to 11 years.

Table 3

Sample Distribution by Ethnic Group

Ethnic group	Frequency	Percentage	Cumulative percentage
Hausa	11	20.00%	20.00%
Mosi	16	29.09%	49.09%
Grusi	9	16.36%	65.45%
Others	19	34.55%	100%
Total	55	100%	

According to Table 3, 20% of the midwives (n = 11) belonged to the Hausa ethnic group, while 29% of the respondents (n = 16) were from the Mosi ethnic group. Grusi was represented by 16% of the respondents (n = 9). There were 19 individuals classified as belonging to other ethnic groups. This group accounted for 34.55% of the total sample.

Table 4

Sample Distribution by Religion

Religion	Frequency	Percentage	Cumulative percentage
Christianity	31	56.36%	56.36%
Islam	21	38.18%	94.55%
Traditional	3	5.45%	100%
Total	55	100%	

Regarding religious affiliation, more than half of the sampled individuals were Christians (n = 31), followed by Muslims (n = 21) who made up 38% of the sample. There were also three respondents who practiced traditional religion.

Results

FGM Rate, Knowledge, and Attitudes

I looked at how the midwives were distributed based on the number of patients they had attended to, the number of patients who underwent FGM, the knowledge level of the midwives about FGM, and the midwives' perception about FGM. Table 5 gives a summary of the data.

Table 5

Number of Patients Attended to, FGM Rate, Knowledge, and Attitude Scores

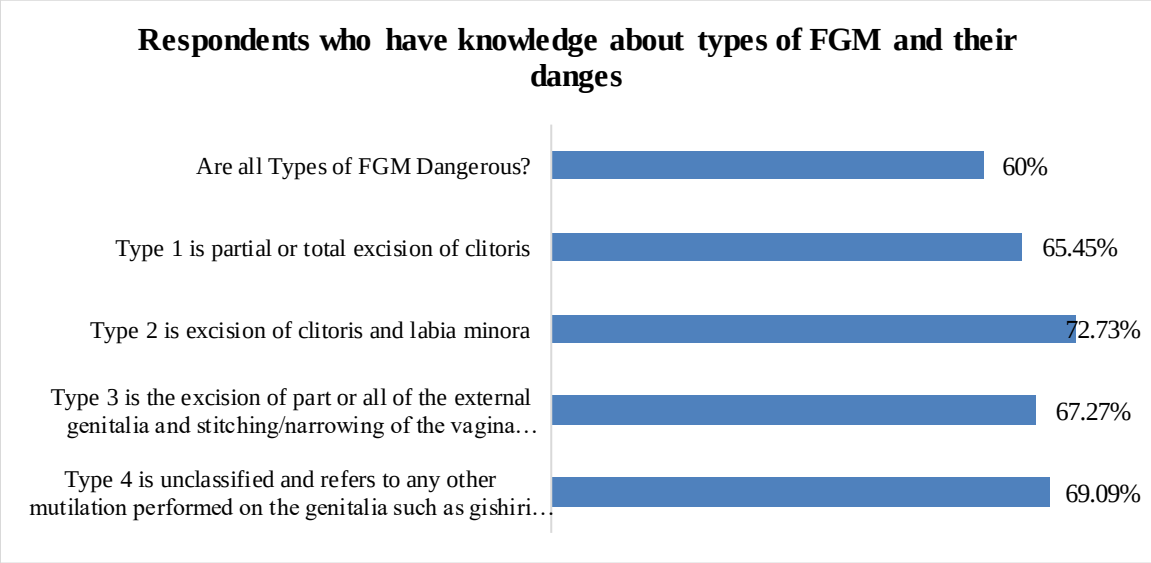
Variable	*N*	*M*	*SD*	Min	Max
In the last 3 months, how many women/girls aged 15 and above have you attended to?	55	34.1	8.48	22	55
Of those you attended to in the last 3 months, how many have undergone FGM?	55	9.1	2.44	5	15
Overall knowledge score	55	11.0	4.88	2	16
Overall attitude score	55	2.5	1.88	0	5

Regarding patients' attendance, I determined that, on average, the midwives had attended to 34.1 women/girls age 15 and above in the last 3 months. The standard deviation was 8.48, and the range was 22 to 55. Of these attended women/girls, an average of 9.1 underwent FGM in the last 3 months. The standard deviation was 2.44, and the range was 5 to 15. Table 5 also provides information on knowledge and attitude of the midwives toward FGM, with a mean overall knowledge score of 11.0 out of 16, indicating that, on average, the midwives were knowledgeable on more than half of the aspects about FGM. The standard deviation was 4.88, and the scores ranged from 2 to 16. Findings also showed a moderate attitude toward FGM, with an overall attitude score of 2.5 out of 5. The standard deviation was 1.88, and the scores ranged from 0 to 5.

To further understand the knowledge and attitudes of the midwives, I explored the individual components that were used in obtaining the knowledge and attitude scores. Figures 1 describes the knowledge of midwives regarding different types of FGM, while Figure 2 describes their knowledge about possible health complications due to FGM.

Figure 1

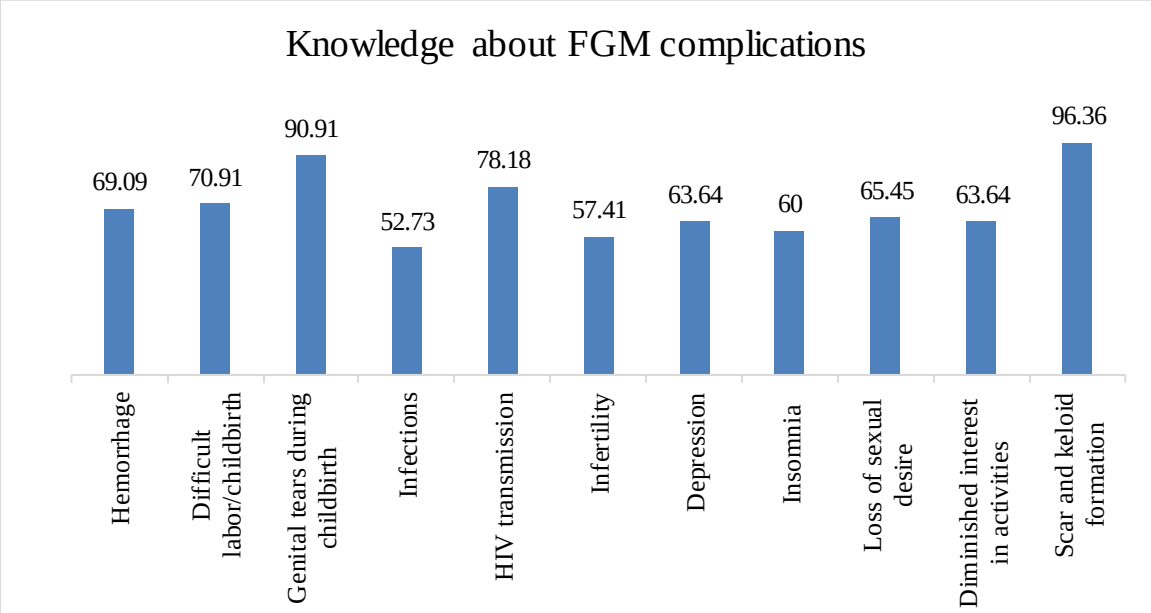
Respondents' Knowledge About FGM Types



From the data, I determined that at least 60% of the midwives had knowledge about the four types of FGM, and acknowledged that the FGM types were dangerous.

Figure 2

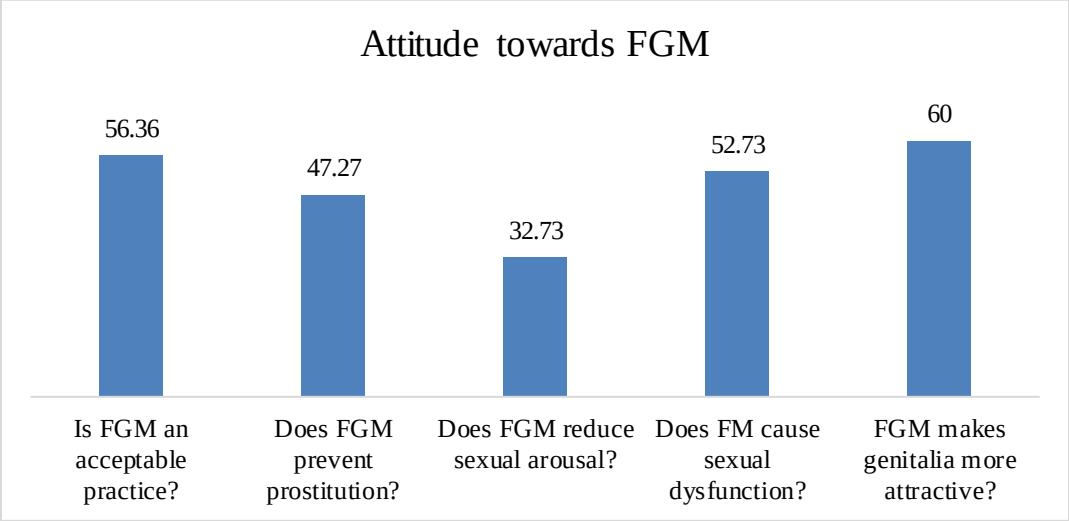
Knowledge About FGM Complications



Regarding FGM complications, about 96% of participants acknowledged scar and keloid formation as a complication resulting from FGM, while 90% acknowledged genital tear during childbirth as a complication rising from FGM. Other complications included HIV transmission (78%), difficult labor/childbirth (71%), hemorrhage (69%), loss of sexual desire (65%), depression (64%), diminished interest in activities (64%), insomnia (60%), infertility (57%), and infections (53%). Further, regarding attitude, I examined midwives' perception on whether FGM is an acceptable practice, and other perceptions such as reducing prostitution, reducing sexual arousal, making genitalia more attractive, and causing sexual dysfunction (see Figure 3).

Figure 3

Attitude Toward FGM



Regarding attitudes toward FGM, the findings showed that 60% perceived FGM as an act that makes genitalia more attractive, while 56% perceived that FGM is an acceptable practice. About 53% considered FGM to cause dysfunction, 47% perceived that FGM prevents prostitution, and 33% perceived that FGM reduces sexual arousal. Next, I plotted scatterplots to examine any potential association between each independent variable, attitudes toward FGM and knowledge about FGM, and the FGM rate. The scatterplots provided needed information about the potential linear relationship between the two variables.

Checking for Associations

I also checked for potential association between the key variables: knowledge about FGM versus FGM cases, and attitude towards FGM versus FGM cases. Here, the scatterplots were used to obtain insight about the associations (see Figures 4 and 5).

Figure 4

Scatterplot of FGM Cases Against Overall Knowledge Score

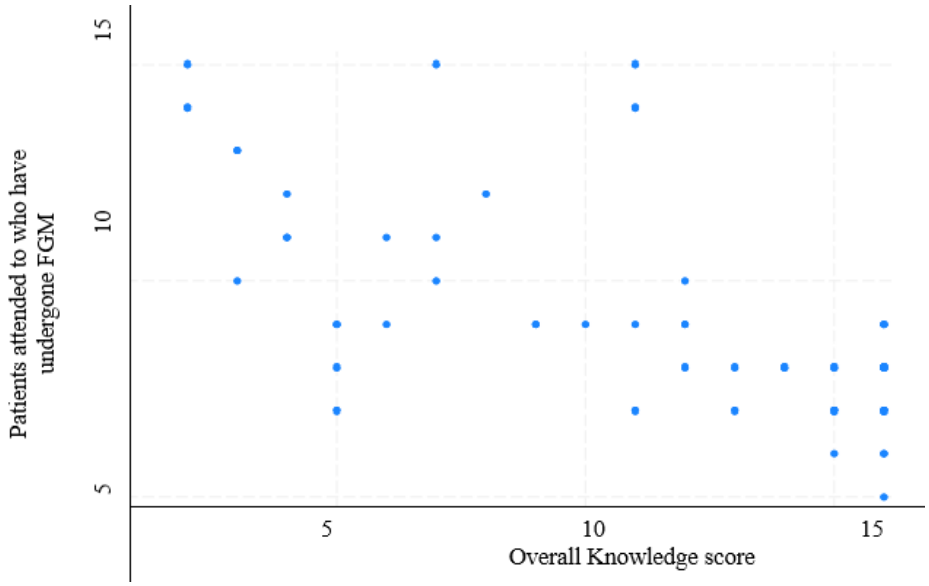
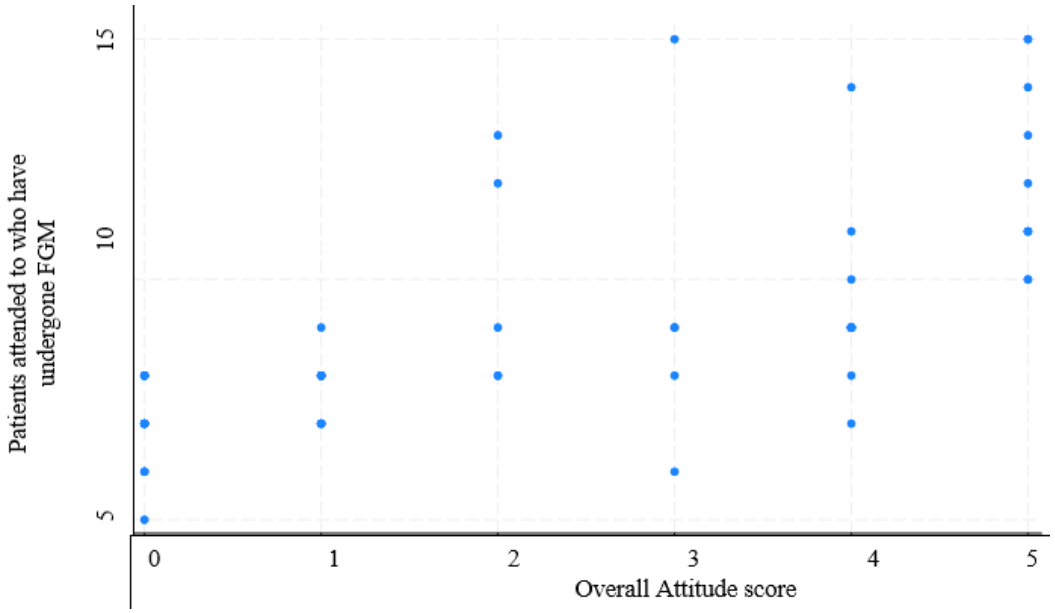


Figure 4 provides information about the relationship between knowledge score of midwives and FGM cases. A higher knowledge score represents higher knowledge about FGM. The scatterplot shows a potential negative relationship between knowledge about FGM and FGM cases. This implies that increasing the knowledge of midwives about FGM is associated with lower cases of FGM.

Figure 5

Scatterplot of FGM Cases Against Attitude Score

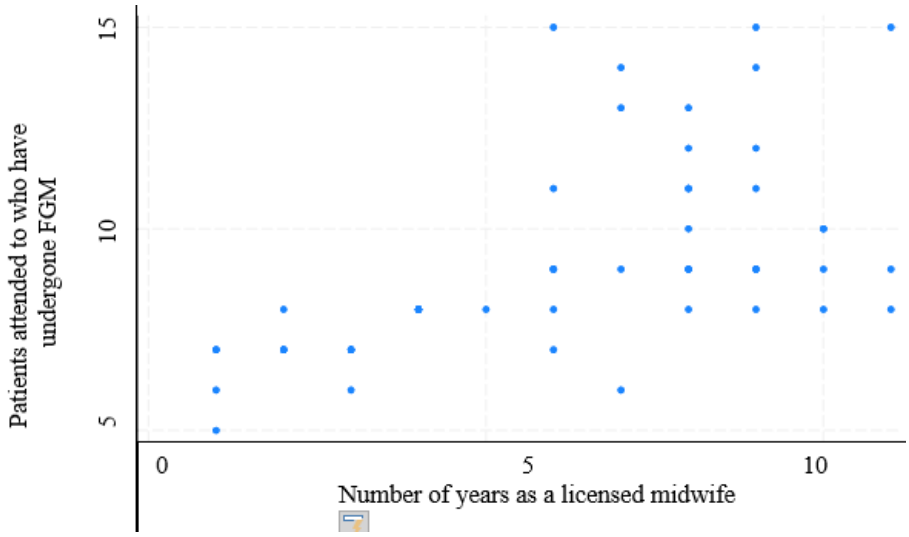


The scatterplot in Figure 5 presents the relationship between attitude score of the midwives and the FGM cases. A higher attitude score indicates a strong perception in favor of FGM. Generally, people with a low attitude score feel that FGM is not a good practice while those with a high attitude score side with FGM practice. The scatterplot shows a potential linear association between attitude score and FGM cases. A stronger attitude in favor of FGM among midwives was associated with higher FGM cases.

I also examined the relationship between FGM prevalence and midwives' years of practice (see Figure 6). Generally, the data indicated the possible positive association between years of study and FGM prevalence. The scatterplot suggests a potential linear association between years of practice and FGM cases.

Figure 6

FGM Prevalence Vs. Years of Practice



Regression Model

Based on the findings from the descriptive statistics, I proceeded to construct a linear regression model to test for the effect of the indepenedent variables (knowledge and attitude of midwives about FGM) and the dependent variable (FGM cases). The multiple linear regression was important because it allowed me to test whether the independent variables had any impact on the dependent variable, the direction of the relationship, and the strength of the effect while controlling for potentially confounding variables.

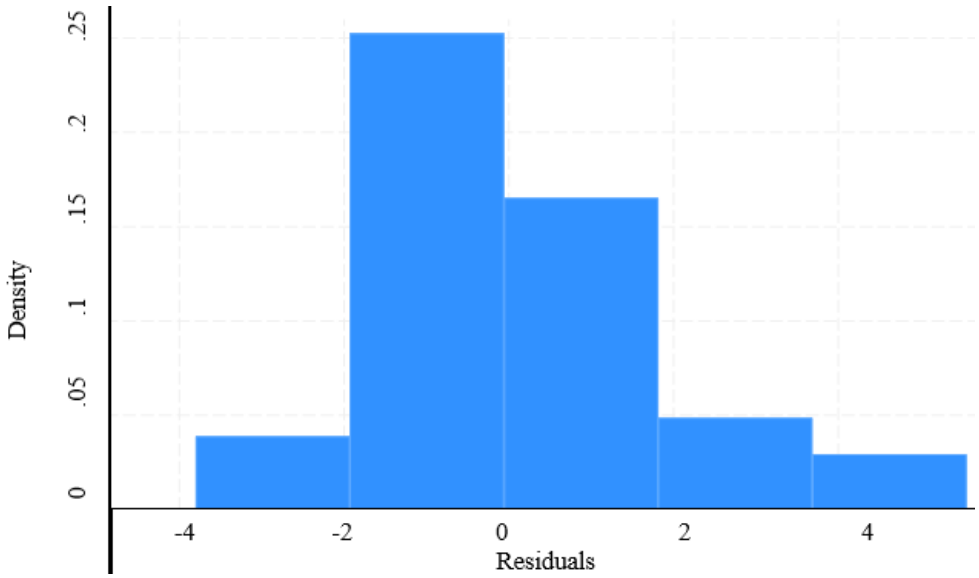
Testing for Regression Analysis Assumptions

Before building the regression model, I first checked whether the linear regression assumptions were met to ensure the reliability of the model. The following multiple regression assumptions were tested:

1. Linear relationship between the independent and the dependent variables was tested based on the scatterplots in the descriptive analysis. The scatterplots indicated a linear association between the midwives' knowledge and attitudes, and FGM cases.
2. Normality of the residuals was tested by plotting a histogram of the residuals as shown in Figure 7. The histogram is close to a bell-shaped curve; however, the right tail in slightly longer than the left tail. This indicates that the normality of the residuals assumption was met.

Figure 7

Histogram Plot of the Residuals



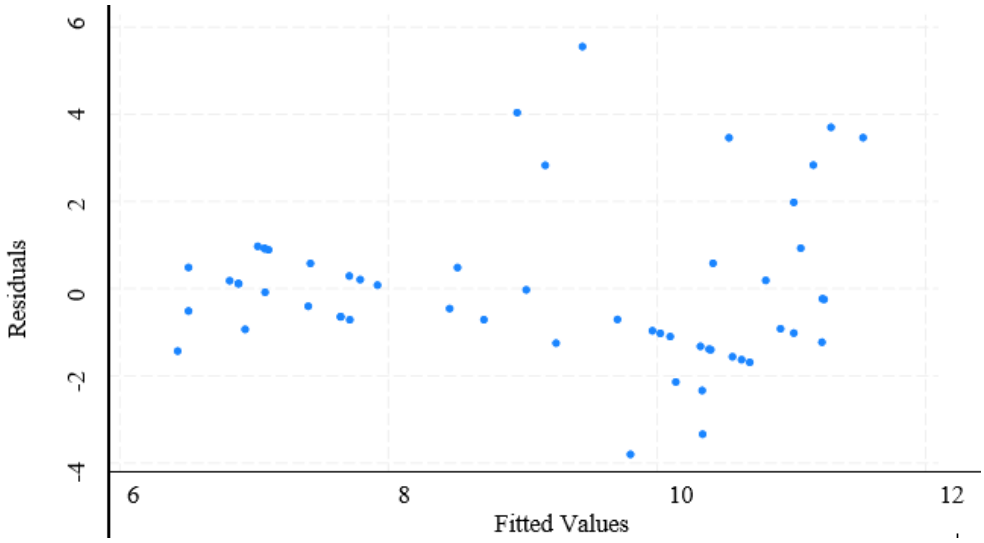
3. Test for presence of heteroscedasticity

I plotted a fitted vs residuals scatter to test for the assumption that the residuals have equal variance. Based on the scatterplot in Figure 8, there was not a clear pattern shown by the residual plots. This implied that the variance of the residuals was equal

across different fitted values. Therefore, I concluded that there was no heteroscedasticity, and the assumption of equal variance was met.

Figure 8

Scatterplot of Fitted Vs. Residuals



4. No autocorrelation

To test for no autocorrelation, I used a variance inflation factor (VIF) approach as shown in Table 6. There was no autocorrelation as the VIF approached 1. From the table, VIF was less than 5 and closer to 1, implying that there was very little autocorrelation between the independent variables. Therefore, I concluded that the no autocorrelation assumption was met.

Table 6

Variance Inflation Factor for Test of Autocorrelation

Variable	VIF	1/VIF
OVERALKNOW~E	1.57	0.638527
Number of years as a licensed midwife	1.56	0.639898
Religion	1.19	0.842302
Ethnic group	1.15	0.866659
Mean VIF	1.37	

Model Building and Interpretation

Per the research questions, I developed three models to test three different sets of hypotheses related to the research questions. The first model examined the relationship between the knowledge score and the prevalence of FGM while controlling for age, ethnicity, religion, and years of licensure. This model provided an answer to the first research question. The second model provided an answer to the second research question because it tested the relationship between attitude score and FGM prevalence while controlling for age, ethnicity, religion, and years of licensure. Finally, the third model answered the third research question by examining the relationship between years of licensure and FGM prevalence.

Table 7 provides a summary of the multiple regression models with knowledge score, ethnic group, religion, and number of years as a licenced midwife as the predictors of FGM cases. Table 8 provides the coefficient summary.

Table 7

Model Summary

Source	*SS*	*df*	*MS*	Number of obs = 55
				$F(4, 50) = 13.75$
Model	168.710	4	42.1775	Prob > F = 0.0000
Residual	153.399	50	3.0680	R^2 = 0.5238
				Adj R^2= 0.4857
Total	322.109	54	5.9650	Root *MSE* = 1.7516

Table 8

Coefficient Summary

FGM cases	Coefficient	*SE*	*t*	*p* > *t*	95% conf. interval	
Knowledge score	-0.2636	0.061	-4.31	0.000	-0.3863	-0.141
Ethnic group	0.238	0.221	1.08	0.287	-0.206	0.682
Religion	0.5039	0.429	1.17	0.246	-0.3587	1.367
Years as licensed midwife	0.2159	0.1	2.16	0.035	0.0155	0.416
_cons	9.3026	1.445	6.44	0.000	6.3994	12.206

Tables 7 and 8 provide information about the statistical model that predicts the FGM cases based on overall knowledge score, ethnic group, religion, and number of years as a licensed midwife. From Table 7, a high F statistic, ($F_{4,50} = 13.75$, $p < 0.001$) indicated that the model significantly predicted the FGM cases.

Model goodness of fit was shown by the R^2 value of 0.5238, implying that 52.38% of the variation in the FGM cases was explained by the independent variables in

the model. Adjusted R^2, which adjusts the R^2 value for the number of predictors, was equal to 0.4857, which was slightly lower than R^2, suggesting a good fit.

From Table 8, I determined that the coefficient of overall knowledge score equaled -0.2636 ($p < 0.001$), indicating that when I controlled for effects of ethnic group, religion, and number of years as a licensed nurse, increasing overall knowledge score decreased possible FGM cases by 0.2636. This coefficient was statistically significant ($p < 0.05$). The intercept coefficient (9.3026) was the estimated value of the FGM cases when all other independent variables were zero. It was statistically significant ($p < 0.05$).

Tables 9 and 10 give a summary of the multiple regression models with attitude score, ethnic group, religion, and number of years as a licenced midwife as the predictors of FGM cases.

Table 9

Model Summary

Source	*SS*	*df*	*MS*	Number of obs = 55
				$F(4, 50) = 10.64$
Model	148.107	4	37.0268	Prob > F = 0.0000
Residual	174.002	50	3.480	R^2 = 0.4598
				Adj R^2= 0.4166
Total	322.109	54	5.965	Root *MSE* = 1.8655

Table 10

Coefficient Summary

FGM cases	Coefficient	*SE*	*t*	*p* > *t*	95% conf. interval	
Knowledge score	0.6824	0.211	3.24	0.002	0.2592	1.106
Ethnic group	0.0807	0.238	0.34	0.736	-0.3969	0.558
Religion	0.2126	0.452	0.47	0.640	-0.6942	1.12
Years as licensed midwife	0.1449	0.132	1.10	0.279	-0.1208	0.411
_cons	5.9925	1.208	4.96	0.000	3.5659	8.419

Tables 9 and 10 provide information about the statistical model that predicted the FGM cases based on overall attitude score, ethnic group, religion, and number of years as a licensed midwife. From Table 9, a high *F* statistic, ($F_{4,50} = 10.64$, $p < 0.001$) indicated that the model significantly predicted the FGM cases.

Model goodness of fit was shown by the R^2 value of 0.4598, implying that 45.98% of the variation in the FGM cases was explained by the independent variables in the model. Adjusted R^2, which adjusts the R^2 value for the number of predictors, was equal to 0.4166, which was slightly lower than R^2, suggesting a good fit.

From Table 10, I determined that the coefficient of overall attitude score equaled 0.6824 ($p = 0.002$), indicating that when I controlled for effects of ethnic group, religion, and number of years as a licensed nurse, increasing overall attitude score increased possible FGM cases by 0.6823. This coefficient was statistically significant ($p < 0.05$).

The intercept coefficient (5.9925) estimated the value of the FGM cases when all other independent variables were zero. It was statistically significant ($p < 0.05$).

Tables 11 and 12 give a summary of the multiple regression models with years as a licenced midwife as the predictor variable and FGM prevalence as the outcome variable.

Table 11

Model Summary

Source	*SS*	*df*	*MS*	Number of obs = 55
				$F(1, 53) = 27.16$
Model	109.144	1	109.144	Prob > $F = 0.0000$
Residual	212.965	53	4.018	$R^2 = 0.3388$
				Adj $R^2 = 0.3264$
Total	322.109	54	5.965	Root *MSE* = 2.0045

Table 12

Coefficient Summary

FGM cases	Coefficient	*SE*	*t*	*p* > *t*	95% conf. interval	
Years as licensed midwife	0.4759	0.0913	5.21	0.000	0.293	0.659
_cons	6.159	0.6303	9.77	0.000	0.895	7.424

Tables 11 and 12 provide information about the statistical model that predicted the FGM cases based on years of practice. From Table 11, $F_{1,53} = 10.64$, $p < 0.001$ indicated that the model significantly predicted the FGM cases. Model goodness of fit was shown by the R^2 value of 0.3388, implying that 33.88% of the variation in the FGM cases was explained by the independent variables in the model. From Table 12, I

determined that the coefficient of years of operation equaled 0.4759 ($p < 0.001$), indicating that increasing the number of years as a licensed nurse increased possible FGM cases by 0. 4759. This coefficient was statistically significant ($p < 0.05$).

Chapter 5: Discussion, Conclusions, and Recommendations

In Chapter 4, I presented the results of the comprehensive analysis and interpretation of the collected data. The chapter clarified the relationships and associations between variables, revealing the effect knowledge and attitudes of midwives about FGM had in reducing FGM cases. In Chapter 5, I shift the focus toward the implications of these findings, drawing meaningful conclusions and insights that contribute to a richer understanding of the research domain. Having established a foundation through thorough data collection and statistical analysis, I discuss the key trends, patterns, and relationships that emerged from the data. By examining the regression outcomes, I answer the research questions and reveal the underlying mechanisms of FGM.

The primary objective of this chapter is to provide a comprehensive discussion and interpretation of the outcomes obtained in the empirical analysis. This chapter addresses the underlying implications of the findings on FGM. Furthermore, this chapter serves as a platform for critical reflection, enabling readers to critically assess the validity and reliability of the findings in relation to existing literature and the theoretical framework. Chapter 5 also provides a discussion of the limitations or constraints that may have impacted the study, thereby providing a balanced perspective on the study's outcomes.

Discussion

The aim of this study was to investigate whether midwives' knowledge about FGM, years of practice and their attidutes toward the practice had significant

relationships with FGM prevalence. To determine whether the knowledge of midwives about FGM had an effect on FGM prevalence, whether the midwives' attitudes toward FGM had a significant effect on FGM prevalence, and whether years of practice had any effect on the FGM prevelence, I conducted a comprehensive analysis of the data collected, controlling for the effects of age, ethnic group, and religion. The analysis showed that both the knowledge and attitudes of midwives had a statistically significant effect on FGM prevalence. The outcomes showed that midwives with strong attitudes in favor of FGM were more likely to report more cases of FGM than those who did not support FGM. Likewise, midwives who had more knowledge about FGM were less likely to report fewer cases than those who lacked knowledge about FGM. The findings of this study emphasize the transformative potential of focusing on midwives' knowledge and attitudes in the fight against FGM. By enhancing midwives' understanding of the harmful effects and promoting an attitude against FGM, the study may contribute to reducing the prevalence of this harmful practice.

On the relationship between years as a licensed midwife and FGM rates, the regression analysis results revealed that years of practice as a licensed midwife was a significant predictor of FGM prevalence. This finding suggests that the longer a midwife has been practicing, the higher the likelihood of encountering FGM cases. From the findings, we note that midwives who have practiced for a longer time were associated with increased FGM rates. These findings may have an important impact on the training and education of midwives. It may be beneficial to incorporate specific training on how

to identify and address FGM cases, particularly for midwives who have been practising for longer periods.

The findings of this study have wide-ranging implications for the practical field, including health care interventions, educational programs, behavior changes, midwives' empowerment, policy and guidelines, collaborative approaches, and research and advocacy. Regarding health care interventions, this study highlights the vital roles of midwives in addressing FGM. Because midwives' knowledge and attitudes significantly impact FGM prevalence, targeted interventions aimed at educating midwives about the dangers of FGM and promoting a more informed and compassionate attitude may contribute to reducing FGM cases. The study also has implications for educational programs because it advocates for developing educational programs for midwives to equip them with accurate information about the adverse physical and psychological consequences of FGM. Through enhanced knowledge, midwives may effectively communicate the risks to patients and their families, potentially leading to a decrease in FGM cases.

Regarding behavior change, the study suggests that initiatives that aim to shift midwives' attitudes away from favoring FGM are essential. Promoting empathy, understanding, and a commitment to human rights may contribute to a decline in FGM prevalence. This study also highlights the need to empower midwives. The study highlights the need to encourage midwives to be advocates against FGM within their communities to create a powerful network of change agents. When midwives actively discourage FGM and support alternatives, their influence can extend beyond clinical

settings and impact societal norms. The study aslso provides evidence for the development of guidelines and policies that emphasize the role of midwives in preventing and addressing FGM. Integrating FGM education and awareness into midwifery training programs and clinical practices may enhance their impact on reducing FGM prevalence.

Considering the current findings in the context of other studies, I determined that the current findings are consistent with most of the previous studies. For instance, Zsabokorszky et al. (2023) established that in Egypt, FGM is deeply ingrained in the culture, and prevailing ideals such as organ cleanliness contribute to its continuation. Similar cultural drivers of FGM were highlighted in Bawku, Ghana. Sakeah et al. (2018) established that the Sande society plays a significant role in promoting FGM, despite government efforts. The symbolic influence of Sande, an organization mainly comprising women, remains powerful. In Sierra Leone, socioeconomic factors influence FGM practices (Crawley & Fynn, 2022), while in Tanzania, tribe, education, and residence play roles. Attitudes change when women are more aware of rights and health consequences (Aziz et al., 2022). In Nigeria, cultural factors, education levels, and religious beliefs contribute to FGM (Aziz et al., 2022). Liberia's Sande society, which promotes FGM, underscores the persistence of cultural forces. Such findings were also seen in the current study because factors such as religion and ethnic group were considered to have a potential influence on FGM. In a broader way, this study acknowleges the role of education and attitudes toward FGM through examining the relationship between midwives' knowledge and attitudes and FGM prevalence. Findings

suggest that health care professionals mat significantly impact FGM practices, offering a unique perspective to combat this harmful practice.

Study Limitations

Although the study revealed key insights about the relationship between midwives' knowledge and attitudes and FGM prevalence, it is also important to acknowledge the study limitations because they help contextualize the findings and guide future research to address these shortcomings and enhance the validity and reliability of the conclusions. Some of the limitations arising from this study design include the following. The findings may not be fully generalizable to other regions or populations outside of Bawku, Ghana. Cultural, socioeconomic, and health care system variations could lead to different results in different contexts. Another limitation is the fact that I used a cross-sectional design, which captured data at a single point in time. This limits the ability to establish causal relationships between midwives' knowledge and attitudes and FGM prevalence. Finally, the study relied on self-reported data from midwives regarding their knowledge and attitudes. Social desirability bias could have lead to an overestimation or underestimation of these factors.

Recommendations

Based on the findings discussed in this chapter, I recommend the following to enable stakeholders to work collaboratively to empower midwives as change agents, to contribute to the reduction of FGM prevalence, and to ensure the well-being and rights of women and girls:

1. Establish an extensive educational programs for midwives that focus on the harmful physical, emotional, and psychological consequences of FGM.
2. Design campaigns through workshops, seminars, and interactive sessions to transform midwives' attitudes toward FGM by promoting empathy, human rights, and gender equality.
3. Foster collaborative approaches with all staeholders such as community leaders, religious figures, and local influencers to raise awareness about the harms of FGM.
4. Establish a system for continuous monitoring and evaluation of the effectiveness of interventions aimed at midwives to track, identify areas for improvement, and ensure that interventions remain aligned with their intended goals.
5. Conduct further research to explore the underlying factors that influence midwives' knowledge, attitudes, and practices related to FGM.

Conclusion

This study revealed the significant impact that midwives' knowledge and attitudes have on the prevalence of FGM among their patients. The findings highlight the critical role midwives play in shaping FGM practices and emphasize the significance of targeted interventions to reduce FGM prevalence. The study findings indicated a clear relationship between midwives' attitudes supportive of FGM and higher reported cases of FGM, while midwives with greater knowledge about FGM tended to report fewer cases of FGM.

The implications of these findings are far-reaching. Efforts to combat FGM should prioritize comprehensive educational programs tailored for midwives, equipping them with accurate information and empowering them to advocate against this harmful practice. Encouraging a shift in midwives' attitudes away from favoring FGM may lead to a decline in its prevalence. Collaborative initiatives involving health care professionals, community leaders, and policymakers are essential to create a united front against FGM. This study emphasizes the pivotal need for health care professionals, particularly midwives, to be at the forefront of efforts to eradicate FGM. Equipping midwives with knowledge, promoting attitudes against FGM, and fostering collaboration with various stakeholders may create a future free from FGM.

References

Acheampong, A., Ohene, L., Asante, I., Kyei, J., Dzansi, G., Adjei, C., Adjei, C.A., Adjorlolo, S., Boateng, F., Woolley, P., Nyante, F., & Aziato, L. (2021). Nurses' and midwives' perspectives on participation in national policy development, review and reforms in Ghana: A qualitative study. *BioMed Central Nursing*, *20*(1), 26. https://doi.org/10.1186/s12912-021-00545-y

Adatara, P., Amooba, P. A., Afaya, A., Salia, S. M., Avane, M. A., Kuug, A., ... & Atachie, C. (2021). Challenges experienced by midwives working in rural communities in the Upper East Region of Ghana: a qualitative study. *BMC Pregnancy and Childbirth*, *21*, 1-8. https://link.springer.com/article/10.1186/s12884-021-03762-0

Adogho, A., Hinsliff-Smith, K., & McGarry, J. (2021). Healthcare professionals' knowledge, attitudes, and experiences of FGM in sub-Saharan Africa: A systematic scoping review. *International Journal of Africa Nursing Sciences, 14*, 100270. https://doi.org/10.1016/j.ijans.2020.100270

Ahinkorah, B., Hagan, J., Jr Ameyaw, E., Seidu, A., Budu, E., Sambah, F., Sambah, F., Yaya, S., Torgbenu, E., & Schack, T. (2020). Socio-economic and demographic determinants of female genital mutilation in sub-Saharan Africa: Analysis of data from demographic and health surveys. *Reproductive Health*, *17*(1), 162. https://doi.org/10.1186/s12978-020-01015-5

Ahmed, W., Puttkammer, N., Gloyd, S., Adam, A., Eltayeb, D., & Farquhar, C. (2022). Turning the tide on female genital mutilation in a high prevalence country: A

programmatic data analysis for Sudan's comprehensive health sector response, 2016-2018. *BMJ Global Health, 7*(10), Article e010020. https://doi.org/10.1136/bmjgh-2022-010020

Akinsulure-Smith, A., Wong, T., & Min, M. (2021). Addressing female genital cutting among service providers in New York. *Professional Psychology, Research and Practice, 52*(3), 202–212. https://doi.org/10.1037/pro0000381

Akweongo, P., Jackson, E., Appiah-Yeboah, S., Sakeah, E., & Phillips, J. (2021). It's a woman's thing: Gender roles sustaining the practice of female genital mutilation among the Kassena-Nankana of northern Ghana. *Reproductive Health, 18*(1), 52. https://doi.org/10.1186/s12978-021-01085-z

Al Awar, S., Al-Jefout, M., Osman, N., Balayah, Z., Al Kindi, N., & Ucenic, T. (2020). Prevalence, knowledge, attitude and practices of female genital mutilation and cutting (FGM/C) among United Arab Emirates population. *BMC Women's Health, 20*(1), 79. https://doi.org/10.1186/s12905-020-00949-z

Ali, S., de Viggiani, N., Abzhaparova, A., Salmon, D., & Gray, S. (2020). Exploring young people's interpretations of female genital mutilation in the UK using a community-based participatory research approach. *BMC Public Health*, *20*, 1-15. https://link.springer.com/article/10.1186/s12889-020-09183-6

Alhassan, A., & Anyinzaam-Adolipore, J. (2021). Female genital mutilation in Ghana: Prevalence and socioeconomic predictors. *Biomed Research International*, 6675579. https://doi.org/10.1155/2021/6675579

Ameyaw, E., Anjorin, S., Ahinkorah, B., Seidu, A., Uthman, O., Keetile, M., & Yaya, S. (2021). Women's empowerment and female genital mutilation intention for

daughters in Sierra Leone: A multilevel analysis. *BMC Women's Health, 21*(1), 200. https://doi.org/10.1186/s12905-021-01340-2

Ameyaw, E., Tetteh, J., Armah-Ansah, E., Aduo-Adjei, K., & Sena-Iddrisu, A. (2020). Female genital mutilation/cutting in Sierra Leone: Are educated women intending to circumcise their daughters? *BMC International Health and Human Rights, 20*(1), 19. https://doi.org/10.1186/s12914-020-00240-0

Anyanwu, C., Torpey, K., Abiodun, O., Sanni, O., & Anyanwu, I. (2022). Variations in the prevalence of female genital mutilation among reproductive-aged women in Nigeria across three generations. *International Journal of MCH and AIDS, 11*(2), Article e548. https://doi.org/10.21106/ijma.548

Ayenew, A. A., Mol, B. W., Bradford, B., & Abeje, G. (2024). Prevalence of female genital mutilation and associated factors among women and girls in Africa: a systematic review and meta-analysis. *Systematic Reviews*, *13*(1), 26. https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-023-02428-6

Aziz, M., Elgibaly, O., & Ibrahim, F. (2022). Effect of parental attitudes on the practice and medicalization of female genital mutilation: A Secondary analysis of Egypt Health Issues Survey, 2015. *BMC Women's Health, 22*(1), 259. https://doi.org/10.1186/s12905-022-01834-7

Balde, M., O'Neill, S., Sall, A., Balde, M., Soumah, A., Diallo, B., & Pallitto, C. (2021). Attitudes of health care providers regarding female genital mutilation and its medicalization in Guinea. *PloS One, 16*(5), Article e0249998.

https://doi.org/10.1371/journal.pone.0249998

Balde, M., Soumah, A., Diallo, A., Sall, A., Mochache, V., Ahmed, W., Toure, A., Diallo, R., Camara, S., O'Neill, S., & Pallitto, C. (2022). Involving the health sector in the prevention and care of female genital mutilation: Results from formative research in Guinea. *Reproductive Health*, *19*(1), 156. https://doi.org/10.1186/s12978-022-01428-4

Bell, J., Lartey, B., Spickernell, G., Darrell, N., Salt, F., Gardner, C., Richards, E., Fasakin, L., Egbeniyi, S., Odongo, E., Ssenkungu, J., Kouadio, R. K., Cissé, M., Rérambyah, A. B. A., Adou, M., West, R., & Sharma, S. (2022). Applying a social-ecological model to understand factors impacting demand for childhood vaccinations in Nigeria, Uganda, and Guinea. *SSM-Qualitative Research in Health*, *2*, 100180. https://doi.org/10.1016/j.ssmqr.2022.100180

Berg, R., Taraldsen, S., Said, M., Sørbye, I., & Vangen, S. (2017). Reasons for and experiences with surgical interventions for female genital mutilation/cutting (FGM/C): A systematic review. *Journal of Sexual Medicine*, *14*(8), 977–990. https://doi.org/10.1016/j.jsxm.2017.05.016

Blaydes, L., & Platas, M. R. (2020). Religion, family structure, and the perpetuation of female genital cutting in Egypt. *Journal of Demographic Economics*, *86*(3), 305-328. https://doi.org/10.1017/dem.2020.15

Bo, H., & Galiani, S. (2021). Assessing external validity. *Research in Economics*, *75*(3), 274-285. https://www.sciencedirect.com/science/article/abs/pii/S1090944321000296

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*(7), 513–531. https://psycnet.apa.org/doi/10.1037/0003-066X.32.7.513

Caperon, L., Saville, F., & Ahern, S. (2022). Developing a socio-ecological model for community engagement in a health programme in an underserved urban area. *PloS one, 17*(9), e0275092. https://doi.org/10.1371/journal.pone.0275092

Capili B. (2021). Cross-sectional studies. *The American Journal of Nursing, 121*(10), 59–62. https://doi.org/10.1097/01.NAJ.0000794280.73744.fe

Coll, C., Santos, T., Wendt, A., Hellwig, F., Ewerling, F., & Barros, A. (2022). Women's empowerment as it relates to attitudes towards and practice of female genital mutilation/cutting of daughters: An ecological analysis of demographic and health surveys from 12 African countries. *Frontiers in Sociology,* 6. https://doi.org/10.3389/fsoc.2021.685329

Correa Ventura, N., & Báez Quintana, D. (2021). Female genital mutilation: Knowledge, attitudes and practices of health professionals on the island of Tenerife. Do we live with our backs to this reality? *Revista Espanola de Salud Publica, 95*, e202109120. https://www.mscbs.gob.es/biblioPublic/publicaciones/recursos_propios/resp/revista_cdrom/VOL95/ORIGINALES/RS95C_202109120.pdf

Crawley, H., & Fynn Bruey, V. (2022). 'Hanging in the Air': The Experiences of Liberian Refugees in Ghana. In *Migration in West Africa: IMISCOE Regional Reader* (pp. 107-127). Cham: Springer International Publishing.

https://link.springer.com/chapter/10.1007/978-3-030-97322-3_6

Dawson, A., Assifi, A., & Turkmani, S. (2022). Woman and girl-centered care for those affected by female genital mutilation: a scoping review of provider tools and guidelines. *Reproductive Health, 19*(1), 1-18. https://doi.org/10.1186/s12978-022-01356-3

Dilbaz, B., İflazoğlu, N., & Tanın, S. (2019). An overview of female genital mutilation. *Turkish Journal of Obstetrics and Gynecology, 16*(2), 129-132. https://doi.org/10.4274/tjod.galenos.2019.77854

Doucet, M., Pallitto, C., & Groleau, D. (2017). Understanding the motivations of health-care providers in performing female genital mutilation: an integrative review of the literature. *Reproductive Health, 14*(1), 1-15. https://doi.org/10.1186/s12978-017-0306-5

El-Dirani, Z., Farouki, L., Akl, C., Ali, U., Akik, C., & McCall, S. (2022). Factors associated with female genital mutilation: A systematic review and synthesis of national, regional and community-based studies. *BMJ Sexual & Reproductive Health, 48*(3), 169–178. https://doi.org/10.1136/bmjsrh-2021-201399

Elnakib, S., & Metzler, J. (2022). A scoping review of FGM in humanitarian settings: an overlooked phenomenon with lifelong consequences. *Conflict and Health, 16*(1), 1-12. https://doi.org/10.1186/s13031-022-00479-5

Evans, C., Tweheyo, R., McGarry, J., Eldridge, J., Albert, J., Nkoyo, V., & Higginbottom, G. (2019a). Crossing cultural divides: A qualitative systematic review of factors influencing the provision of healthcare related to female genital

mutilation from the perspective of health professionals. *PloS One, 14*(3), e0211829. https://doi.org/10.1371/journal.pone.0211829

Evans, C., Tweheyo, R., McGarry, J., Eldridge, J., Albert, J., Nkoyo, V., & Higginbottom, G. (2019b). Seeking culturally safe care: A qualitative systematic review of the healthcare experiences of women and girls who have undergone female genital mutilation/cutting. *BMJ Open, 9*(5), e027452. https://doi.org/10.1136/bmjopen-2018-027452

Farouki, L., El Dirani, Z., Abdulrahim, S., Akl, C., Akik, C., & McCall, S. (2022). The prevalence of female genital mutilation: A systematic review and meta-analysis of national, regional, facility and school-based studies. *PLoS Medicine, 19*(9), e1004061. https://doi.org/10.1371/journal.pmed.100406

Ghana Statistical Service. (2021). 2021 Population and housing census: Summary report of final results. *Ministry of Finance.* http://www.statsghana.gov.gh/gssmain/storage/img/marqueeupdater/Census2021_Summary_report_of_final_results.pdf

González-Timoneda, A., Ruiz Ros, V., González-Timoneda, M., & Cano Sánchez, A. (2018). Knowledge, attitudes and practices of primary healthcare professionals to female genital mutilation in Valencia, Spain: Are we ready for this challenge? *BMC Health Services Research, 18*(1), 579. https://doi.org/10.1186/s12913-018-3396-z

Hayden, J. (2019). *Introduction to health behavior theory.* Burlington, MA: Jones & Bartlett Learning.

Jahangiry, L., Pashaei, T., & Ponnet, K. (2021). Attitudes toward female genital mutilation/circumcision: A systematic review and meta-analysis. *Healthcare (Basel, Switzerland), 9*(9), 1184. https://doi.org/10.3390/healthcare9091184

Jeng, A., & Mulugeta, S. (2022). Preventive and supportive measures towards the abandonment of female genital mutilation/cutting: A minor field study in the Gambia. https://urn.kb.se/resolve?urn=urn:nbn:se:du-42602

Johansen, R. (2019). The applicability of the Theory of Planned Behavior for research and care of female genital cutting. *Archives of Sexual Behavior, 50*(5), 1935–1941. https://doi.org/10.1007/s10508-020-01716-9

Johnson-Agbakwu, C. E., Michlig, G. J., Koukoui, S., Akinsulure-Smith, A. M., & Jacobson, D. S. (2023). Health outcomes and female genital mutilation/cutting: how much is due to the cutting itself?. *International Journal of Impotence Research*, *35*(3), 218-227. https://www.nature.com/articles/s41443-022-00661-6

Kang, H. (2021). Sample size determination and power analysis using the G* Power software. *Journal of educational evaluation for health professions, 18*.https://www.jeehp.org/journal/view.php?doi=10.3352/jeehp.2021.18.17

Kawous, R., Allwood, E., Middelburg, A., van der Kwaak, A., Geraci, D., Bos, M., & van den Muijsenbergh, M. (2022). Attitude and intention of migrant populations in the Netherlands regarding female genital mutilation/cutting. *BioMed Central Women's Health, 22*(1), 405. https://doi.org/10.1186/s12905-022-01979-5

Kesmodel, U. (2018). Cross-sectional studies–what are they good for? *Acta Obstetricia et*

Gynecologica Scandinavica, *97*(4), 388-393. https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/aogs.13331

Kyei, J., Dzansi, G., Acheampong, A. K., Adjei, C. A., Ohene, L. A., Adjorlolo, S., ... & Aziato, L. (2023). Factors Influencing Nurses and Midwives' Participation in Research: A Qualitative Study. *Nursing & Midwifery Research Journal*, *19*(1), 5-21.https://journals.sagepub.com/doi/abs/10.1177/0974150X221146075

Larsson, M., Cohen, P., Hann, G., Creighton, S., & Hodes, D. (2018). An exploration of attitudes towards female genital mutilation (FGM) in men and women accessing FGM clinical services in London: A pilot study. *Journal of Obstetrics and Gynecology*, *38*(7), 1005–1009. https://doi.org/10.1080/01443615.2018.1437718

Lee, Y., & Park, S. (2021). Understanding of physical activity in social ecological perspective: application of multilevel model. *Frontiers in Psychology*, *12*, 622929. https://www.frontiersin.org/articles/10.3389/fpsyg.2021.622929/full

Le Masson, V., Fordham, M., & Fergus, I. (2020). *Adolescent girls in crisis.* https://plan-international.org/uploads/sites/30/2021/12/adolescent_girls_in_crisis-voices_from_the_sahel_technical_report_eng.pdf

Levy, A., Beausang, J., Finley, E., & Wolf, S. (2021). Provider knowledge and attitudes about female genital mutilation/cutting in Philadelphia. *Journal of Immigrant and Minority Health*, *23*(1), 45–53. https://doi.org/10.1007/s10903-020-01018-1

Matanda, D. J., Van Eekert, N., Croce-Galis, M., Gay, J., Middelburg, M. J., & Hardee, K. (2023). What interventions are effective to prevent or respond to female genital mutilation? A review of existing evidence from 2008-2020. *PLOS Global Public*

Health, *3*(5), e0001855. https://doi.org/10.1371/journal.pgph.0001855

Mason D. J. (2020). 2020: the Year of the Nurse and Midwife. *Journal of urban health : bulletin of the New York Academy of Medicine*, *97*(6), 912–915. https://doi.org/10.1007/s11524-020-00470-6

Molina-Gallego, B. M.-M., Gómez-Cantarino, S., Polonio-López, B., & Ugarte-Gurrutxaga, M. (2021). Female genital mutilation: Knowledge and skills of health professionals. *Healthcare (Basel, Switzerland)*, *9*(8), 974. https://doi.org/10.3390/healthcare9080974

Njue, C., Karumbi, J., Esho, T., Varol, N., & Dawson, A. (2019). Preventing female genital mutilation in high income countries: A systematic review of the evidence. *Reproductive Health*, *13*(1), 113. https://doi.org/10.1186/s12978-019-0774-x

Nonterah, E., Agorinya, I., Kanmiki, E., Kagura, J., Tamimu, M., Ayamba, E., Nonterah, E., Kaburise, M., Al-Hassan, M., Ofosu, W., Oduro, A., & Awonoor-Williams, J. (2020). Trends and risk factors associated with stillbirths: A case study of the Navrongo War Memorial Hospital in Northern Ghana. *PloS One*, *15*(2), e0229013. https://doi.org/10.1371/journal.pone.0229013

Nonterah, E., Kanmiki, E., Agorinya, I., Sakeah, E., Tamimu, M., Kagura, J., Kaburise, M., Ayamba, E., Nonterah, E., Awuni, D., Al-Hassan, M., Oduro, A., Ofosu, W., & Awonoor-Williams, J. (2020). Prevalence and adverse obstetric outcomes of female genital mutilation among women in rural Northern Ghana. *European Journal of Public Health*, *30*(3), 601–607. https://doi.org/10.1093/eurpub/ckz195

Nordmann, K., Subirón-Valera, A., King, M., Küpper, T., & Martínez-Pérez, G. (2022).

Management of female genital mutilation/cutting-related obstetric complications: A training evaluation. *International Journal of Environmental Research and Public Health, 19(*15), 9209. https://doi.org/10.3390/ijerph19159209

Obioha, C., Obioha, O., & Martin, M. (2022). Female genital mutilation/cutting and breastfeeding outcomes: The modifying effects of healthcare access and women's attitudes to FGM/C. *Women*, *2*(3), 204-217. https://doi.org/10.3390/women2030021

Obiora, O., Maree, J., & Nkosi-Mafutha, N. (2020). Female genital mutilation in Africa: Scoping the landscape of evidence. *International Journal of Africa Nursing Sciences, 12*, 100189. https://doi.org/10.1016/j.ijans.2019.100189

Ocran, B., & Atiigah, G. (2022). An insider–outsider approach to understanding the prevalence of female genital mutilation in Pusiga in the upper east region of Ghana. *Social Sciences*, *11*(11), 1-17. https://doi.org/10.3390/socsci11110526

Ohene, L., Acheampong, A., Dzansi, G., Kyei, J., Adjei, C., Adjorlolo, S., Asante, I. N., Woolley, P., Nyante, F., & Aziato, L. (2022). The image of nurses and midwives in Ghana: Patient and family perspectives. *Global qualitative nursing research*, *9*, 23333936221137584. https://doi.org/10.1177/23333936221137584

Onuh, S., Igberase, G., Umeora, J., Okogbenin, S., Otoide, V., & Gharoro, E. (2006). Female genital mutilation: Knowledge, attitude and practice among nurses. *Journal of the National Medical Association, 98*(3), 409–414. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2576104/

Opoku, M. P., Elhoweris, H., Amponteng, M., Nketsia, W., Torgbenu, E. L., & Saah, R. (2023). Pre-service healthcare professionals attitudes and self-efficacy towards individuals with intellectual disability in Ghana. *BMC medical education, 23*(1), 714.https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-023-04697-0

Pallitto, C., & Ahmed, W. (2021). The role of the health sector in contributing to the abandonment of female genital mutilation. *Med, 2*(5), 485-489. https://doi.org/10.1016/j.medj.2021.04.023

Pashaei, T., Ponnet, K., Moeeni, M., Khazaee-pool, M., & Majlessi, F. (2016). Daughters at risk of female genital mutilation: Examining the determinants of mothers' intentions to allow their daughters to undergo female genital mutilation. *PLoS One, 11*(3), e0151630. https://doi.org/10.1371/journal.pone.0151630

Pastor-Bravo, M., Almansa-Martínez, P., & Jiménez-Ruiz, I. (2022). Factors contributing to the perpetuation and eradication of female genital mutilation/cutting in sub-Saharan women living in Spain. *Midwifery, 105*, 103207. https://doi.org/10.1016/j.midw.2021.103207

Patino, C. M., & Ferreira, J. C. (2018). Internal and external validity: can you apply research study results to your patients? *Jornal Brasileiro de Pneumologia*, *44*(3), 183. https://doi.org/10.1590/S1806-37562018000000164

Scarneo, S. E., Kerr, Z. Y., Kroshus, E., Register-Mihalik, J. K., Hosokawa, Y., Stearns, R. L., DiStefano, L. J., & Casa, D. J. (2019). The Socioecological Framework: A Multifaceted Approach to Preventing Sport-Related Deaths in High School

Sports. *Journal of athletic training*, *54*(4), 356–360. https://doi.org/10.4085/1062-6050-173-18

Sabi Boun, S., Otu, A., & Yaya, S. (2023). Fighting female genital mutilation/cutting (FGM/C): towards the endgame and beyond. Reproductive Health, 20(1), 1-5.https://reproductive-health-journal.biomedcentral.com/articles/10.1186/s12978-023-01601-3

Sakeah, E., Debpuur, C., Aborigo, R., Oduro, A., Sakeah, J., & Moyer, C. (2019). Persistent female genital mutilation despite its illegality: Narratives from women and men in northern Ghana. *PloS One, 14*(4), e0214923. https://doi.org/10.1371/journal.pone.0214923

Sakeah, E., Debpuur, C., Oduro, A., Welaga, P., Aborigo, R., Sakeah, J., & Moyer, C. (2018). Prevalence and factors associated with female genital mutilation among women of reproductive age in the Bawku municipality and Pusiga District of northern Ghana. *BMC Women's Health, 18*(1), 150. https://doi.org/10.1186/s12905-018-0643-8

Savitz, D., & Wellenius, G. (2023). Can cross-sectional studies contribute to causal inference? It depends. *American Journal of Epidemiology, 192*(4), 514-516. https://doi.org/10.1093/aje/kwac037

Seidu, A., Aboagye, R., Sakyi, B., Adu, C., Ameyaw, E., Affum, J., & Ahinkorah, B. (2022). Female genital mutilation and skilled birth attendance among women in sub-Saharan Africa. *BioMed Central Women's Health*, *22*(1), 26. https://doi.org/10.1186/s12905-021-01578-w

Seidu, A., Osman, H. D., Bimpong, K., & Afriyie, K. (2021). Female genital mutilation/cutting resulting in genital tract obstruction and sexual dysfunction: A case report and literature review. *Case Reports in Obstetrics and Gynecology, 2021*, 9986542. https://doi.org/10.1155/2021/9986542

Setia M. (2016). Methodology series module 3: Cross-sectional studies. *Indian Journal of Dermatology, 61*(3), 261–264. https://doi.org/10.4103/0019-5154.182410

Shakirat, G., Alshibshoubi, M., Delia, E., Hamayon, A., & Rutkofsky, I. (2020). An overview of female genital mutilation in Africa: Are the women beneficiaries or victims? *Cureus, 12*(9), e10250. https://doi.org/10.7759/cureus.10250

Stevenson, K., & Kelly, B. (2022). New research on the global prevalence of female genital mutilation/cutting: Research, clinical, and policy implications. *PLoS medicine, 19*(9), e1004096. https://doi.org/10.1371/journal.pmed.1004096

Suleiman, I., Maro, E., Shayo, B., Alloyce, J., Masenga, G., Mahande, M., & Mchome, B. (2021). Trend in female genital mutilation and its associated adverse birth outcomes: A 10-year retrospective birth registry study in Northern Tanzania. *PloS One, 16*(11), e0244888. https://doi.org/10.1371/journal.pone.0244888

Tarr-Attia, C., Boiwu, G., & Martínez-Pérez, G. (2019). 'Birds of the same feathers fly together': Midwives' experiences with pregnant women and FGM/C complications - a grounded theory study in Liberia. *Reproductive Health, 16*(1), 18. https://doi.org/10.1186/s12978-019-0681-1

Tseer, T., Sulemana, M., & Marfo, S. (2022). Elite mobilisation and ethnic conflicts: evidence from bawku traditional area. *Cogent Social Sciences, 8*(1), 2123137.

https://www.tandfonline.com/doi/full/10.1080/23311886.2022.2123137

Turkmani, S., Homer, C., & Dawson, A. (2019). Maternity care experiences and health needs of migrant women from female genital mutilation-practicing countries in high-income contexts: A systematic review and meta-synthesis. *Birth (Berkeley, Calif.), 46*(1), 3–14. https://doi.org/10.1111/birt.12367

Turkmani, S., Homer, C., Varol, N., & Dawson, A. (2018). A survey of Australian midwives' knowledge, experience, and training needs in relation to female genital mutilation. Women and birth: *Journal of the Australian College of Midwives, 31*(1), 25–30. https://doi.org/10.1016/j.wombi.2017.06.009

UNICEF. (2020). Measuring effectiveness of female genital mutilation elimination: A compendium of indicators. New York: UNICEF https://www.unfpa.org/sites/default/files/pub-pdf/026_UF_CompendiumOfIndicatorsFGM_21-online_F.pdf

UNICEF. (2022, May). *Female genital mutilation (FGM).* https://data.unicef.org/topic/child-protection/female-genital-mutilation/

Valentini, M., dos Santos, G., & Muller Vieira, B. (2021). Multiple linear regression analysis (MLR) applied for modeling a new WQI equation for monitoring the water quality of Mirim Lagoon, in the state of Rio Grande do Sul—Brazil. *SN Applied Sciences, 3,* 1-11. https://link.springer.com/article/10.1007/s42452-020-04005-1

Wang, X., & Cheng, Z. (2020). Cross-sectional studies: Strengths, weaknesses, and recommendations. *Chest, 158*(1), S65-S71.

https://doi.org/10.1016/j.chest.2020.03.012

Yussuf, M., Matanda, D., & Powell, R. (2020). Exploring the capacity of the Somaliland healthcare system to manage female genital mutilation / cutting-related complications and prevent the medicalization of the practice: A cross-sectional study. *BMC Health Services Research, 20*(1), 200. https://doi.org/10.1186/s12913-020-5049-2

Zsabokorszky, Z., Van de Velde, S., Michielsen, K., & Van Eekert, N. (2023). Exploring the association between perceived male attitudes and female attitudes toward the discontinuation of Female Genital Mutilation/Cutting in Egypt. *Frontiers in Sociology*, *8*. https://pubmed.ncbi.nlm.nih.gov/37520496/

Appendix: Questionnaire

Demographics

Age

1. 18-24
2. 25-29
3. 30-34
4. 35-39
5. 40-44
6. 45+

Ethnic group

1. Hausa
2. Mosi
3. Grusi
4. Others

Religion

1. Christiani
2. Islam
3. Traditional
4. Others

Number of years as licensed midwife

FGM prevalence among your patients

In the last 3 months, how many women/girls aged 15 and above have you attended to?

Of those you attended to in the last 3 months, how many have undergone FGM?

Knowledge Score

What is your knowledge about the following types of FGM?

- Type 1 is partial or total excision of clitoris (Yes, No, or Don't Know)
- Type 2 is excision of clitoris and labia minora (Yes, No, or Don't Know)
- Type 3 is the excision of part or all of the external genitalia and stitching/narrowing of the vagina opening (infibulation) (Yes, No, or Don't Know)
- Type 4 is unclassified and refers to any other mutilation performed on the genitalia such as gishiri cut, piercing and massaging of any part of external genitalia (Yes, No, or Don't Know)
- Are all types of FGM dangerous? (Yes, No, or Don't Know)

Some types of FGM complications are:

- Hemorrhage (Yes, No, or Don't Know)
- Difficult labor/childbirth (Yes, No, or Don't Know)
- Genital tears during childbirth (Yes, No, or Don't Know)
- Infections (Yes, No, or Don't Know)
- HIV transmission (Yes, No, or Don't Know)
- Infertility (Yes, No, or Don't Know)

- Depression (Yes, No, or Don't Know)
- Insomnia (Yes, No, or Don't Know)
- Loss of sexual desire (Yes, No, or Don't Know)
- Diminished interest in activities (Yes, No, or Don't Know)
- Scar and keloid formation (Yes, No, or Don't Know)

Attitude Scale

Is FGM an acceptable practice? (Yes, No, or Don't Know)

Does FGM prevent prostitution? (Yes, No, or Don't Know)

Does FGM reduce sexual arousal? (Yes, No, or Don't Know)

Does FM cause sexual dysfunction? (Yes, No, or Don't Know)

FGM makes genitalia more attractive? (Yes, No, or Don't Know)

ODK universal link with the questionnaire for the collection of data:

https://ee.kobotoolbox.org/x/B52VJvWf