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Original Research Article

The Effect of Training on FGM/C-related Obstetric and Neonatal Complications' Preventive Practices among Nurse/Midwives

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Abstract: ***Background*****:** Female Genital Mutilation/Cutting (FGM/C) remains a major public health issue in Isiolo County, Kenya, despite national declines. It is linked to serious obstetric and neonatal complications. However, nurses and midwives often lack the necessary knowledge and skills to manage such cases. Targeted training interventions can strengthen their capacity to improve preventive practices and clinical care. ***Methods*****:** A quasi-experimental study with pre- and post-intervention assessments was conducted among nurses and midwives in selected hospitals in Isiolo County. Data were collected using structured questionnaires to assess knowledge, attitudes, sociocultural influences, and preventive practices related to FGM/C-associated obstetric and neonatal complications. The intervention comprised structured training sessions focused on clinical management, cultural competence, and legal frameworks. Data were analyzed using descriptive statistics, paired samples t-tests, and chi-square tests to determine the significance of changes pre- and post-intervention. ***Results*****:** The study revealed significant improvements in knowledge and preventive practices among nurses and midwives following the training intervention. Knowledge scores increased significantly ($p < 0.05$) across domains related to immediate physical, gynecological, obstetric, and sexual harms of FGM/C. Attitudes toward FGM/C-related complications shifted positively, with increased recognition of the professional responsibility to intervene. Post-intervention, a higher proportion of respondents reported confidence in identifying and managing FGM/C complications and advocating against the practice. Despite these gains, some sociocultural barriers persisted, highlighting the complexity of changing attitudes in culturally entrenched settings. ***Conclusion*****:** Targeted training interventions significantly enhance nurses' and midwives' knowledge, attitudes, and preventive practices concerning FGM/C-related obstetric and neonatal complications. These findings underscore the importance of capacity-building strategies in high-prevalence regions to improve maternal and neonatal health outcomes.

Keywords: Effect, FGM/C, Obstetric Complications, Neonatal Outcomes, Nurses, Midwives, Training Intervention, Isiolo County, Kenya, Preventive Practices, Cultural Competence.

INTRODUCTION

Female Genital Mutilation/Cutting (FGM/C) refers to all procedures involving partial or total removal of the external female genitalia or other injury to the female genital organs for non-medical reasons, as defined by [1]. This practice is commonly performed by individuals without medical training using rudimentary tools such as scissors, knives, razors, or even glass shards. FGM/C is a deeply entrenched cultural practice prevalent in various parts of Africa, the Middle East, and other regions [2].

According to [3], the type of FGM/C practiced often varies by ethnicity, with nearly 90% of cases classified as Types I, II, or IV. The WHO categorizes FGM/C into four types: Type I (clitoridectomy), Type II (excision), Type III (infibulation), and Type IV (other harmful procedures like pricking or scraping). Globally, approximately 100 to 140 million women and girls have undergone some form of FGM/C, and 30 million girls aged 15-19 are estimated to have experienced it [3].

Although global efforts have led to a reduction in FGM/C prevalence in some regions, the practice

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persists, especially in areas like Isiolo County, Kenya. The Kenya Demographic Health Survey [4], shows a decline in FGM/C from 38% in 1998 to 15% in 2022. However, the practice remains high among certain ethnic groups such as the Somali, Kisii, and Maasai communities. The health implications of FGM/C are severe, ranging from immediate complications like pain, hemorrhage, and infection to long-term effects such as chronic pain, obstetric complications, psychological trauma, and adverse neonatal outcomes.

Midwives and nurses play a critical role in identifying and managing FGM/C-related complications. Proper training equips them with skills to develop birth plans, provide antenatal care, manage obstetric emergencies, and counsel affected women. In Isiolo County, the prevalence of FGM/C is among the highest in Kenya, with significant negative impacts on women's health, education, and social wellbeing. However, healthcare providers in this region often lack adequate knowledge and skills to manage these complications effectively.

This study seeks to address these gaps by evaluating the effect of a targeted training intervention on nurses' and midwives' knowledge, attitudes, and practices concerning FGM/C-related obstetric and neonatal complications in Isiolo County.

METHODOLOGY

This study employed a quasi-experimental design with pre- and post-intervention assessments to evaluate the effect of Training on FGM/C-related Obstetric and Neonatal Complications' Preventive Practices among Nurse/Midwives. The research was conducted in Isiolo County, Kenya, specifically at Isiolo County Teaching and Referral Hospital and Merti Sub-County Hospital, where the prevalence of FGM/C is notably high.

The study population consisted of nurses and midwives providing maternal and neonatal care in these hospitals. A census sampling method was used due to the relatively small number of staff within maternity units. Data collection was carried out using structured questionnaires administered both before and after the intervention, covering areas such as knowledge, attitudes, sociocultural influences, and preventive practices related to FGM/C.

The intervention comprised structured training sessions delivered over three days, focusing on clinical management of FGM/C-related complications, legal and ethical responsibilities, and culturally sensitive preventive practices. The training methods included lectures, discussions, case studies, and simulation exercises.

Data were analyzed using SPSS version 25, applying descriptive statistics for demographic data and inferential statistics such as paired t-tests, independent t-tests, and chi-square tests to examine changes and associations. A significance level of $p < 0.05$ was used to determine statistical significance.

Ethical approval was granted by Chuka University Ethical Review Committee and NACOSTI. Participants provided informed consent, and confidentiality and voluntary participation were upheld throughout the study.

RESULTS

1.0 Socio-economic Characteristics of the Respondents

The study involved a total of 56 nurses /midwives who were from two health facilities. Of these, 29 participants from Isiolo County Teaching and Referral Hospital (ICTRH) formed the intervention group**,** while 27 participants from Merti Sub-County Hospital constituted th**e** control group. The majority of respondents were female (76.8%), married (69.6%), Muslims (69.6%), held diploma qualifications (62.5%), and were nurses (96.4%). The participants ranged in age from 22 to 57 years, with a mean age of 36.88 years (SD = 7.65). The variance was calculated to be approximately 58.52. Work experience ranged from 1 to 34 years, with a mean of 9.46 years (SD = 7.44), suggesting a mix of both newly employed and experienced health professionals. The majority of respondents (91.1%) relied on government hospital salaries as their primary income, while a minority (26.8%) reported having secondary sources of income, such as business or private clinical work. Monthly incomes ranged from KES 14,000 to KES 150,000, with a mean of KES 64,660.71 (SD = 30,094.56).

Table 1: Socio-Demographic Characteristics of both Intervention and Control Groups, Including Statistical Associations

Characteristic	Category	Control (Merti Hospital)	Intervention (ICTRH)	p-value
Age	(≤ 35 years)	11 (39.3%)	17 (60.7%)	0.181
	(≥ 36 years)	16 (57.1%)	12 (42.9%)	
Sex	Male	6 (46.2%)	7 (53.8%)	0.865
	Female	21 (48.8%)	22 (51.2%)	
Marital Status	Married	19 (48.7%)	20 (51.3%)	0.909
	Not Married	8 (47.1%)	9 (52.9%)	

Characteristic	Category	Control (Merti Hospital)	Intervention (ICTRH)	p-value
Religion	Muslim	20 (51.3%)	19 (48.7%)	0.487
	Christian	7 (41.2%)	10 (58.8%)	
Highest Level of Education	Certificate	0 (0.0%)	1 (100.0%)	0.127
	Diploma	14 (40.0%)	21 (60.0%	
	Degree	13 (65.0%)	7 (35.0%)	
Work Experience	≤ 5 years	8 (36.4%)	14 (63.6%)	0.153
	≥ 6 years	19 (55.9%)	15 (44.1%)	
Current Position	Nurse	27 (50.0%)	27 (50.0%)	0.165
	Midwife	0 (0.0%)	2 (100.0%)	
Monthly Income (KES)	≤ 50,000	12 (50.0%)	12 (50.0%)	0.817
	> 50,000	15 (46.9%)	17 (53.1%)	
Primary Source of Income	Government Hospital Salary	27 (52.9%)	24 (47.1%)	0.024*
	Locums	0 (0.0%)	5 (100.0%)	
Additional Source of Income	Yes	8 (53.3%)	7 (46.7%)	0.643
	No	19 (46.3%)	22 (53.7%)	

*Significant at p<0.05;

1.2 Effect of Training on FGM/C-related Obstetric and Neonatal Management Practice

A chi-square test of independence was conducted to assess whether there was a significant difference in baseline practice levels (poor vs. moderate practice) between midwives/nurses from ICTRH and Merti H. There was no statistically significant difference in the levels of FGM/C-related preventive practice between the ICTRH and Merti H groups, χ^2 (1, N = 56) = 2.609, p = 0.106. Although a higher proportion of participants in ICTRH (63.0%) exhibited poor practice compared to Merti H (37.0%), and moderate practice was more prevalent in Merti H (58.6%) than in ICTRH (41.4%), these differences were not statistically meaningful. The findings indicate that both groups were comparable in their practice levels before the intervention. Post-intervention, the results revealed a statistically significant association between group and practice classification**,** χ^2 (1, N = 56) = 56.000, p < 0.001**).** This was supported by the Likelihood Ratio (χ^2 = 77.561**,)** and Fisher's Exact Test (p = 0.000). All participants in the ICTRH group (100.0%) were classified as having good practice, while all participants in the Merti H group (100.0%) were classified as having poor practice after the intervention. The findings suggest that the training intervention had a substantial and statistically significant effect on enhancing FGM/C-related obstetric and neonatal management practices in ICTRH, but no effect in Merti H.

Also, an independent samples t-test was conducted to compare baseline FGM/C-related preventive practice scores between nurses and midwives from ICTRH and Merti H health facilities. The results showed that the mean score for the Isiolo group was slightly higher (M = 22.07, SD = 18.00) compared to the Merti H group (M = 19.26, SD = 11.74). However, this difference was not statistically significant, t (54) = 0.686, p = 0.496). This indicates that both groups were comparable at baseline with respect to their practice scores, strengthening the internal validity of subsequent intervention comparisons. A paired samples t-test was conducted to assess effect of the intervention on FGM/C-related preventive practice scores in the ICTRH and Merti H groups. In ICTRH Isiolo, there was a statistically significant increase in scores from baseline (M = 22.07%, SD = 18.00) to Endline (M = 53.79%, SD = 22.74), t (28) = −6.735, p < 0.001). This reflects a substantial improvement in midwives' practice following the intervention. Similarly, the Merti H group showed a statistically significant improvement from baseline (M = 19.26%, SD = 11.74) to Endline (M = 36.30%, SD = 27.76), t (26) = −2.880, p = 0.008) However, the change in Merti was less pronounced, suggesting that while the intervention was effective in both contexts, its effect was greater in ICTRH. These findings affirm the effectiveness of the training intervention, especially in ICTRH.

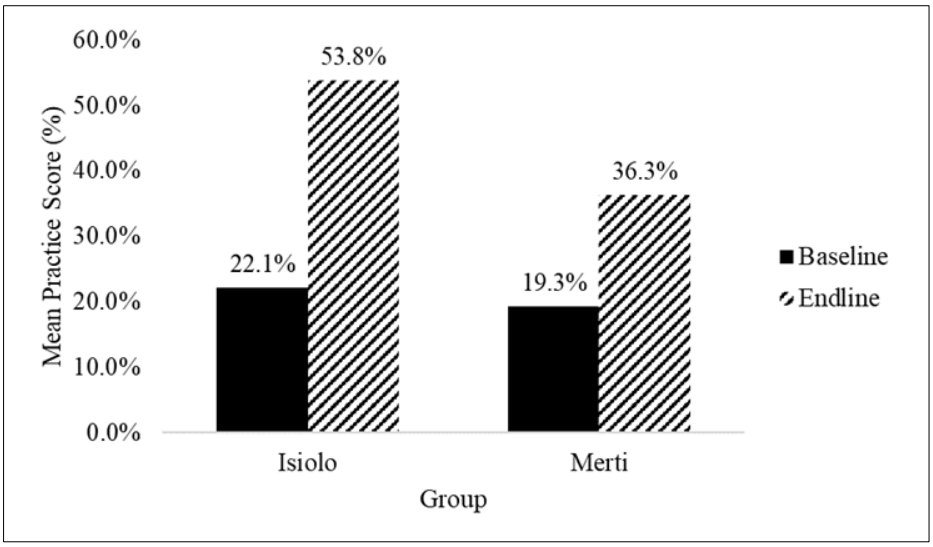

Figure 1: Effect of Training on FGM/C-Related Preventive Practice

1.3 The Effect of the Intervention on FGM/C-related Knowledge

At baseline, most participants from both ICTRH and Merti reported poor knowledge regarding FGM/C. All the respondents from Isiolo (100%) and the majority from ICTRH (88.9%) reported as having poor knowledge levels. Therefore, after Chi-square test there was no statistically significant association between facility group (ICTRH or Merti) and baseline FGM/C-related knowledge level, (χ^2 1, N = 56) = 3.283, p = 0.070). Based on the independent samples t-test the mean knowledge score related to FGM/C was slightly higher in Merti (55.74%) compared to ICTRH (51.21%). However, this difference was not statistically significant, t (54) = -1.693, p = 0.096 (two-tailed). These findings suggest that participants from both sites began the study with comparable levels of knowledge, supporting the validity of post-intervention comparisons.

Following the intervention, after Chi-square test significant difference in FGM/C-related knowledge levels was observed between the ICTRH and Merti groups. In ICTRH ,93.1% of participants were reported as having good knowledge, compared to only 25.9% in Merti. This difference was statistically significant (χ^2 (1, N = 56) = 26.454, p < 0.001). Indicating a strong association between facility group and post-intervention knowledge level. The findings suggest that the intervention had a considerable positive impact on knowledge acquisition in ICTRH, while its effect in Merti was more limited.

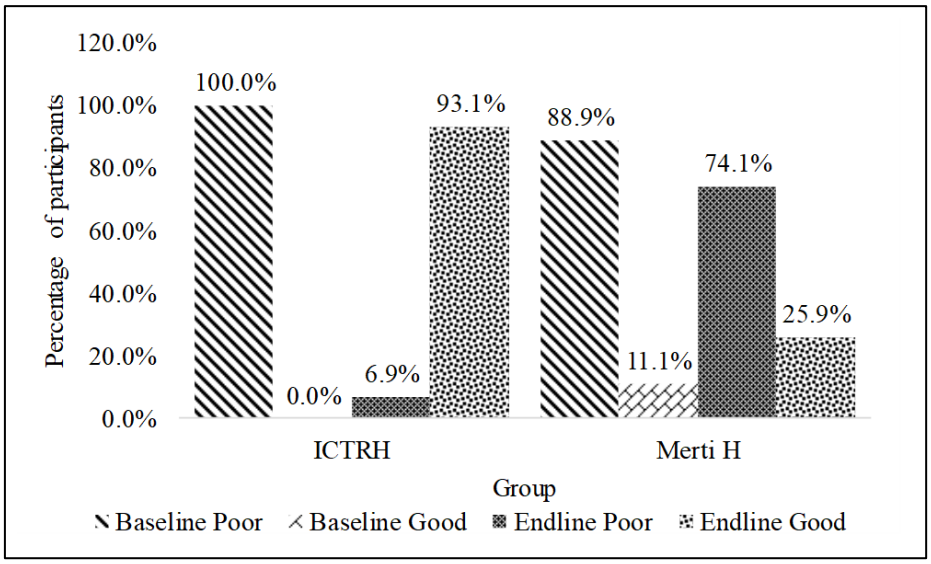

Figure 2: Effect of the Intervention on FGM/C-Related Knowledge Following Chi-Square Test

A paired samples t-test was also conducted to assess the effect of a training intervention. In ICTRH, participants' average knowledge score increased from 51.2% at baseline to 87.1% at Endline, a highly significant improvement (t (28) = -11.249, p < .001). In Merti, knowledge scores rose from 55.7% to 63.5%,

representing a statistically significant but smaller gain (t (26) = -3.049, p = .005). These findings suggest that the intervention was effective in enhancing knowledge in ICTRH.

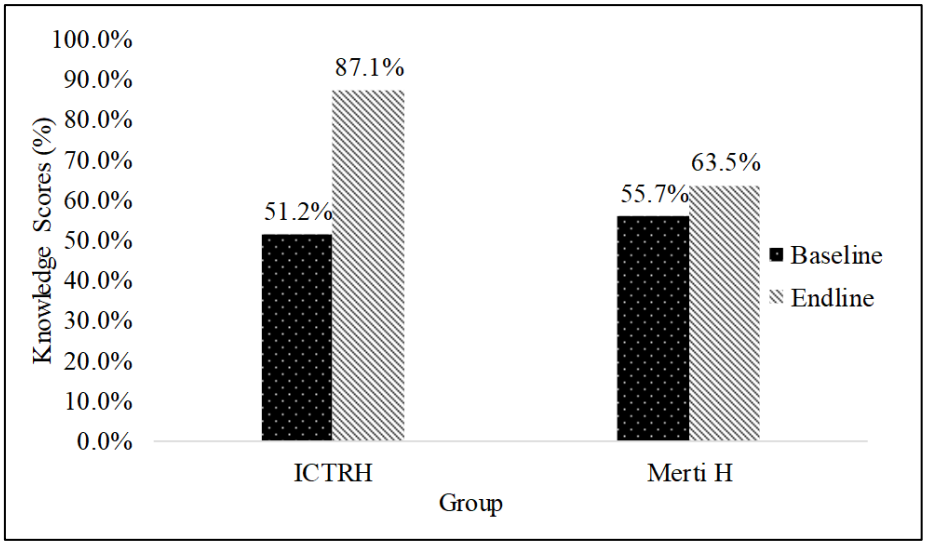

Figure 3: Effect of the Intervention on FGM/C-related Knowledge Following a Paired Samples T-Test

1.4 The Effect of the Intervention on FGM/C-related Nurses/Midwives Attitude

At baseline, out of 56 respondents, the majority (82.1%) had poor perception, with similar proportions observed in both ICTRH (82.8%) and Merti (81.5%). Only 17.9% overall demonstrated good perception, showing no meaningful variation between the two locations. A chi-square test was conducted and the results indicated no statistically significant association between the two variables, χ^2 (1, N = 56) = 0.016, p = .901.). Both ICTRH and Merti had similarly high proportions of poor perception (over 80%), indicating a uniform trend of low perception levels across the two groups, regardless of geographical setting. Following the intervention, out of 56 respondents, 55.4% demonstrated good perception while 44.6% had poor perception regarding FGM/C-related issues. In ICTRH, 58.6% of participants exhibited good perception compared to 51.9% in Merti. After a chi-square test was conducted there was no significant difference in perception outcomes between Isiolo and Merti post-intervention (χ^2 (1, N = 56) = 0.259, p = .611). While descriptive results show a modest increase in the proportion of respondents with good perception in Isiolo statistical test suggests this variation was not strong enough to be considered significant.

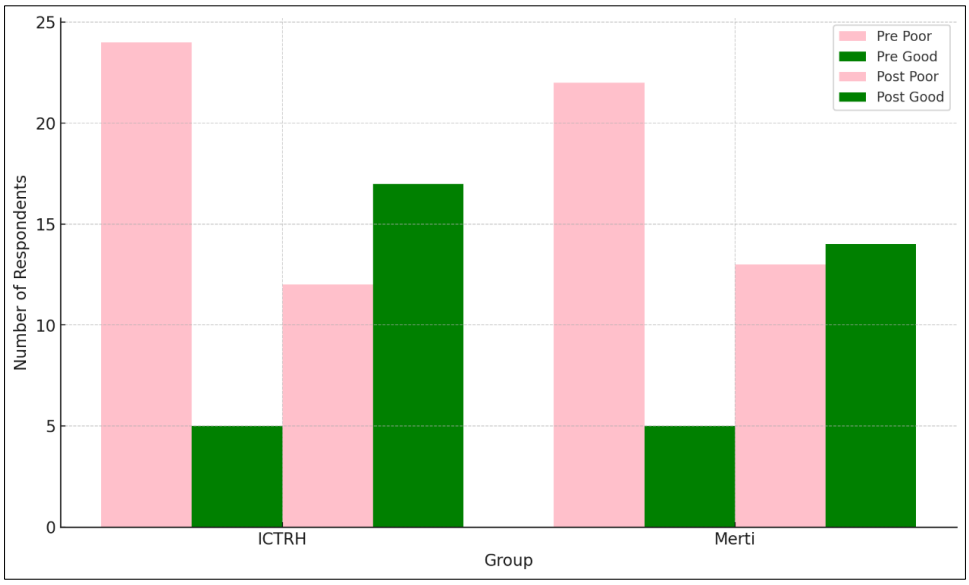

Figure 4: Change in Perception Classification Pre and Post Intervention following Chi-Square Test

Before the intervention, an independent samples t-test was conducted and the mean perception scores were similar between the two groups, with Isiolo recording a mean of 60.44 (SD = 12.14) and Merti 60.04 (SD = 12.57). The close proximity of these scores suggests that both groups had comparable levels of

perception regarding FGM/C-related issues at baseline. The analysis revealed no significant difference in perception scores between the Isiolo and Merti groups before the intervention (t (54) = 0.121, p = 0.452). Following intervention paired samples t-tests revealed that both ICTRH and Merti experienced statistically significant improvements in perception scores. In ICTRH, the mean perception score increased from 60.44 to 73.69, with (t (28) = -4.826, p < .00) while in Merti, it increased from 60.04 to 73.30(t (26) = -4.346, p < .001.). These results confirm a statistically significant improvement in perception scores following the intervention.

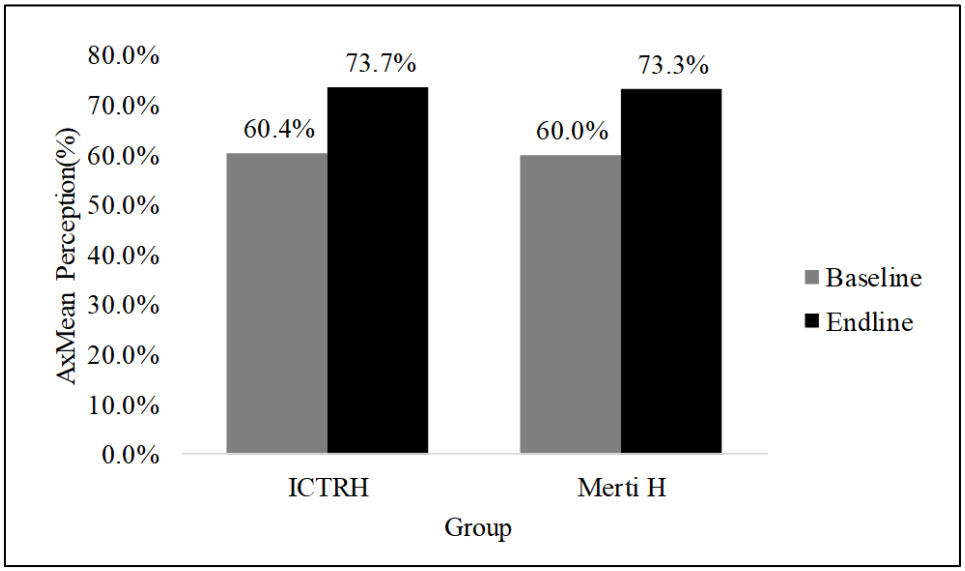

Figure 5: Mean Perception Scores change before and After Intervention Following a Paired Samples t-test

1.5 The Effect of the Intervention on Nurses/Midwives Social Cultural Factors on FGM/C

Before the intervention, 82.1% of respondents reported no sociocultural influence, with 82.8% in Isiolo and 81.5% in Merti, while 17.9% acknowledged such influence. Chi-Square test was conducted and results indicate that there was no statistically significant relationship between the respondents' location and sociocultural influence on professional practice before the intervention (χ^2 (1) = 0.016, p = 0.901). After the intervention, 64.3% of respondents reported being influenced by sociocultural factors, with similar distributions in ICTRH (65.5%) and Merti (63.0%), while 35.7% overall indicated no influence. No statistically significant difference between ICTRH and Merti regarding perceived sociocultural influence on professional practice (χ^2 (1) = 0.040, p = 0.842). Before the intervention, 82.1% of respondents did not perceive sociocultural factors as influencing their practice, but after the intervention, this trend reversed, with 64.3% acknowledging such influence.

At baseline, after independent samples t-test the mean sociocultural influence score in ICTRH was 55.19 (SD = 17.46), while in Merti, the mean was slightly higher at 56.40 (SD = 16.88). The mean difference between the two groups was -1.21 points, suggesting minimal variation in perceived sociocultural influence prior to the intervention. Following the intervention, the mean sociocultural influence score in ICTRH (Isiolo) was 56.71 (SD = 26.96), while in Merti it was 56.80 (SD = 26.76). The analysis revealed that there was no statistically significant difference in sociocultural influence scores between ICTRH and Merti after the intervention (t(54) = -0.011, p = 0.991). Both groups had nearly identical mean scores. The wide standard deviations in both groups, however, indicate considerable variability in individual responses, highlighting the diverse ways in which sociocultural dynamics are perceived.

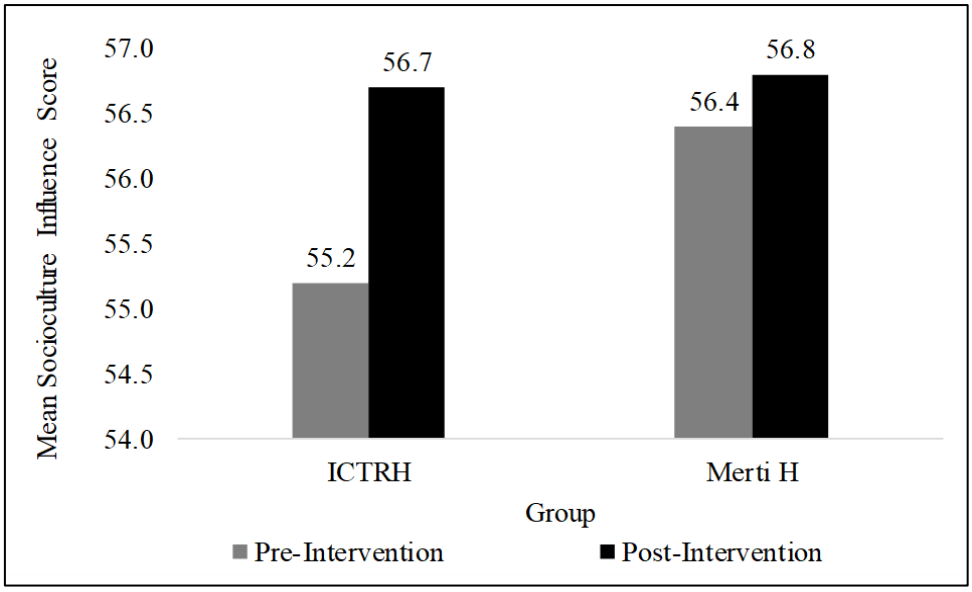

Figure 6: The Effect of the Intervention on Nurses/Midwives Social Cultural Factors on FGM/C

1.6 DISCUSSION

The findings of this study revealed that both ICTRH and Merti facilities had poor baseline knowledge, practice, and attitudes toward FGM/C-related obstetric and neonatal complications, with no statistically significant differences between the two. These results are consistent with [1], which reported widespread deficiencies in healthcare providers' knowledge of FGM/C-related complications globally, largely due to inadequate integration of this content into pre-service and in-service training. Following the intervention, ICTRH demonstrated a significant improvement in both knowledge and practice**,** with 100% of respondents achieving good practice and 93.1% attaining good knowledge post-intervention. In contrast, Merti showed only modest improvements**,** with all participants still categorized as having poor practice despite a statistically significant increase in mean practice scores. This mirrors the findings of [5], who emphasized that well-designed, competency-based training—particularly when reinforced by simulations and strong institutional backing leads to substantial improvements in clinical practice**.** The improvement in knowledge at ICTRH also reflects findings by [6], who demonstrated that simulation-based training and mentorship programs significantly enhance FGM/C-related knowledge, especially when institutional and resource support is adequate. Further aligns with [7], who noted that the impact of structured training is typically more pronounced in urban, well-supported environments where organizational readiness facilitates successful implementation. Regarding attitudes**,** although both facilities exhibited statistically significant within-group improvements, the changes were modest and statistically comparable between groups post-intervention**.** This is in agreement with [8], who highlighted that attitude towards FGM/C are deeply entrenched in sociocultural norms and are typically resistant to change through short-term or isolated training interventions. The findings reinforce that while knowledge and practice can be significantly improved through targeted interventions, shifting attitudes requires sustained, culturally sensitive strategies. In relation to sociocultural influences on practice, the study found no significant differences between ICTRH and Merti post-intervention, despite an overall increase in awareness of these factors. This is consistent with [9], who found that healthcare providers often underestimate sociocultural influences unless explicitly addressed through targeted training. Moreover, these findings align with [10], who noted that while interventions can raise awareness of sociocultural factors, this awareness does not necessarily lead to immediate behavioral change without addressing deeper systemic and cultural drivers.

1.7 CONCLUSION

Although both facilities started from similar baselines, ICTRH showed significantly greater improvements in knowledge and practice compared to Merti, highlighting the effectiveness of the intervention in settings with stronger institutional readiness. While both sites recorded improvements in attitudes and sociocultural awareness, these changes were modest and statistically comparable between the two facilities.

1.8 Acknowledgements

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1.9 DECLARATIONS

Funding: The researcher used his own money in funding all the research activities and resources.

Conflict of Interest: There are no conflicts of interest.

Ethical Approval: Ethical approval was obtained from Kenya Methodist university Ethics and Research Committee

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