



# OPEN Traditional female cervical cauterization and risk of preterm birth in Somalia: a single-center prospective observational study

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Numerous traditional practices are both beneficial and harmful. Traditional harmful practices, such as female genital mutilation and traditional cervical cauterization, are carried out for a number of reasons but can have negative health and social effects. In addition to deeply held beliefs, a lack of knowledge and awareness of the consequences of these practices contributes to the persistence of these issues. The objective of this study is to examine whether traditional cervical cauterizations were associated with preterm births in Somalia. This prospective cohort study was conducted at our hospital over a one-year period. Seven hundred and two patients were included in this study; these patients were divided into two groups, cauterized and non-cauterized groups, and the two groups were compared on pregnancy outcomes. We examined whether traditional cervical cauterizations were associated with adverse pregnancy outcomes, including preterm births. According to the findings of this study, traditional cervical cauterization was prevalent among patients visiting MSTREH ( $n = 328$ , 46.7%). Infections of the uterine cervix and infertility were the two main indications for cauterization, 44.8%, and 34.8%, respectively. Being older, uneducated, and poverty were significantly associated with traditional cauterization ( $P < 0.001$ ). There was a significant correlation between prior traditional cervical cauterization and the risk of preterm births. Women with prior cauterization were two and half times more likely to deliver a preterm fetus (OR: 2.64, 95% CI 2.15–3.33) compared to non-cauterized mothers. Our findings show that women who have previously undergone traditional cervical cauterization have a significantly higher risk of preterm birth and negative pregnancy outcomes than non-cauterized women. Health professionals, particularly those who are close to the community, are crucial in developing and putting into practice plans to end harmful traditions in Somalia.

**Keywords** Cauterization, Tradition, Cervical, Preterm delivery, Abortion

## Abbreviations

CIN	Cervical intraepithelial neoplasia
LEEP	Loop electrosurgical excision procedure
HTP	Harmful traditional practices
WHO	World Health Organization

Traditions are ingrained social norms that are frequently passed down through many generations within a community. These traditional practices are founded on the beliefs and values of the community members<sup>1,2</sup>. Traditional medicine includes knowledge, approaches, and diverse treatment practices based on religious beliefs, community experiences, and culture<sup>3</sup>. Traditional medicine is defined by the World Health Organization (WHO) as health practices, approaches, knowledge, and beliefs that use plant, animal, and mineral-based medicines, spiritual therapies, manual techniques, and exercises alone or in combination to diagnose, treat, prevent, and maintain health<sup>4</sup>.

Traditional cauterization involves applying hot metal rods, knives, or fire to diseased body parts for therapeutic purposes<sup>5</sup>. The number of cauterization in a single session varies, and the location of the application is

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unique to each disease<sup>6,7</sup>. Traditional cauterization is used to treat various illnesses, including hemorrhage, hemorrhoids, sciatica, toothaches, poor eyesight, stomach upsets, infertility, infections, jaundice, cancer, and muscular pain<sup>3,5–10</sup>. Recent studies have shown that cautery causes serious infections and complications including septicemia and death<sup>5,9</sup>. Cautery, used in modern medicine, such as diathermy and laser treatment, remains one of the most frequent techniques used by traditional healers<sup>9</sup>.

Cauterization is one of the oldest forms of traditional medicine that is still practiced today<sup>5</sup>. Traditional services are used by 80% of the population in developing countries for treatment, disease prevention, or health maintenance<sup>6</sup>. Cauterization of the cervix and other traditional therapies where herbs and chemicals are inserted into the vagina are among the traditional therapies practiced in Sub-Saharan Africa despite the lack of evidence that it is effective<sup>7</sup>.

In Ethiopia and Eritrea, traditional cauterization is among the harmful traditional procedures that continue to be practiced; however, most of the people who participate in all the practices do not know about the harmful effects of these procedures<sup>1,2,5</sup>.

In Somalia, traditional cauterization was the primary method of treatment for conditions such as facial paralysis and hepatitis, infections of the uterine cervix, infertility, parotitis, and childhood rickets, and the vast majority of Somalis reportedly underwent cauterization at some point in their lives with iron rods, wood, or palm leaves<sup>5</sup>.

Traditional cervical cauterization is among the harmful traditions widely practiced in Somalia, especially in rural populations. However, unfortunately, there are no detailed data about this traditional cauterization. In addition, Since Abortion is Illegal; this method of cauterization is not used for illegal abortion purposes in Somalia.

Any procedure that compromises the cervix's integrity has been linked to poor pregnancy outcomes, including preterm birth and spontaneous abortions<sup>11</sup>.

Previous studies found an association between cervical intraepithelial neoplasia (CIN) surgery and Preterm births. In addition, curettage, assisted reproductive technology, treatments for precancerous cervical changes, conization/cone biopsy, and cauterization/ablation have been significantly associated with preterm births<sup>12–14</sup>.

No report or publication has highlighted the positive or negative impact of this method. Thus, this study was conducted to highlight whether Female traditional cervical cauterization procedures were associated with Preterm births in a tertiary hospital in Somalia.

## Methods

This prospective cohort study was conducted at our hospital over a one-year period. The study included pregnant women aged 18 and older who visited our department during the study period. Patients were grouped into two groups: Group 1, women who had previously undergone traditional cervical cauterization procedures, and Group 2, women who were not exposed to this procedure. The primary outcome measure was differences in pregnancy outcomes and whether traditional cervical cauterization procedures were associated with adverse pregnancy outcomes, including preterm birth and cesarean delivery. The pediatric population was excluded from the study due to ethical concerns, and the potential for unclear responses when filling out the questionnaire. Furthermore, emergency patients were excluded from the study due to the inability to complete the questionnaire. Potential confounders of preterm birth were excluded from this study. These confounders include prior preterm births, prior cervical excisional procedures including LEEP and Conization, major congenital anomalies, hypertension, gestational diabetes, cervical incompetency, antepartum hemorrhage, multiple pregnancies, intrauterine fetal demise, fetal growth restriction, and pre-labor rupture of membranes. However, patients who are experiencing preterm birth and cervical incompetency after undergoing cervical traditional cauterization were included in this study.

The research design was a prospective cohort observational face-to-face interview-based study. Four obstetrics and gynecology residents conducted the interviews and completed a standardized structured questionnaire regarding sociodemographic characteristics, data concerning traditional cervical cauterization procedures, and pregnancy outcomes.

The socio-demographic characteristics such as age, parity, gestational weeks of current pregnancy, mode of delivery of previous pregnancies, residency, and history of preterm births and abortion were documented. Furthermore, the questionnaire asked about prior traditional cervical cauterization procedures, their experience, knowledge, and attitudes regarding this treatment method, and the indications for cauterization.

Women with prior traditional cervical cauterization procedures (N = 328) were compared to women unexposed to traditional cervical cauterization procedures (N = 374) and looked at differences in pregnancy outcomes between the two groups. Women who had previously undergone traditional cervical cauterization were asked about the timing of the procedure, such as whether it occurred during the current pregnancy or just before it. We also examined whether traditional cervical cauterization procedures were associated with preterm births. In the present study, preterm delivery is defined as a delivery that occurs from 24 to 36 weeks of gestation<sup>15</sup>.

## Ethical consideration

The ethical research board committee of Mogadishu Somalia Turkish Training and Research Hospital approved the research (REF. MSTH/7891). In addition, all study participants consented to use their medical and surgical data in this study. This study was carried out in accordance with the Helsinki Declaration's contents.

## Data analysis

The data was collected using paper forms, then entered into Microsoft Excel (2016) for cleaning and coding then exported to Statistical Package for Social Sciences (SPSS v21, IBM, Armonk, NY, USA) software. Categorical variables were expressed as frequency and percentages. Numerical variables were first tested for assumption of normality with the Shapiro–Wilk test. Non-normal distributed variables were expressed as median with

inter-quartile range. A chi-square test was applied to compare participants' features among those exposed and not exposed to traditional cervical cauterization. Mann–Whitney *U* test was applied to compare non-variables among the two study groups. Binary logistic regression was applied to ascertain the association between socio-demographic characteristics, pregnancy outcomes, and traditional cervical cauterization. *P*-value < 0.05 was taken as statistically significant.

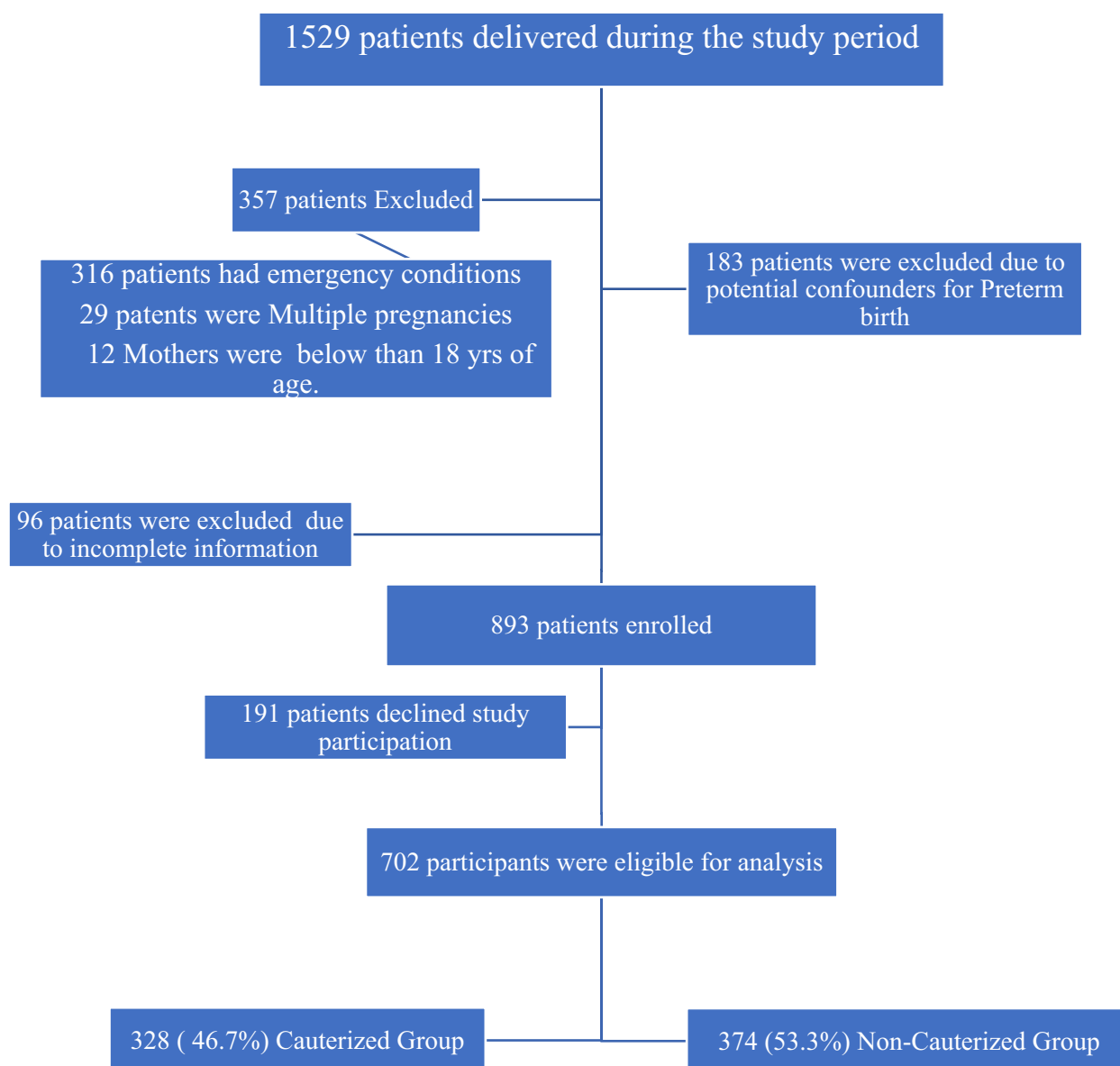
## Results

During the study period, 1529 patients were admitted and delivered to the hospital. 357 patients were excluded from the study, including patients with emergency conditions (316), multiple pregnancies (29), and mothers under the age of 18 (12). In addition, 191 patients declined to participate in the study. Patients with potential confounders for preterm birth (183) were also excluded from the study (Fig. 1).

Seven hundred and two patients were included in this study. The median age of patients was 26 (IQR = 22–30) years. Median gravida and parity were 3 (IQR = 2–6) and 3 (IQR = 1–5), respectively. Regarding the gestational weeks, most patients (*n* = 441, 62.8%) were term deliveries, while 23.8% were preterm deliveries. Approximately (*n* = 94, 13.4%) of the patients in the study group were spontaneous abortions. Most participants were from urban areas (*n* = 527, 75%). More than half of the participants came from low-income families (*n* = 445, 63.4%). According to the educational level of the patients, More than half of the participants were uneducated (*n* = 439, 62.5%).

Table 1 displays the socio-demographic features and cauterization history of the patients.

Nearly half of the women had a history of traditional cervical cauterization (*n* = 328, 46.7%). Regarding indications for traditional cervical cauterization, infection, and infertility were the two main reasons for cauterization,

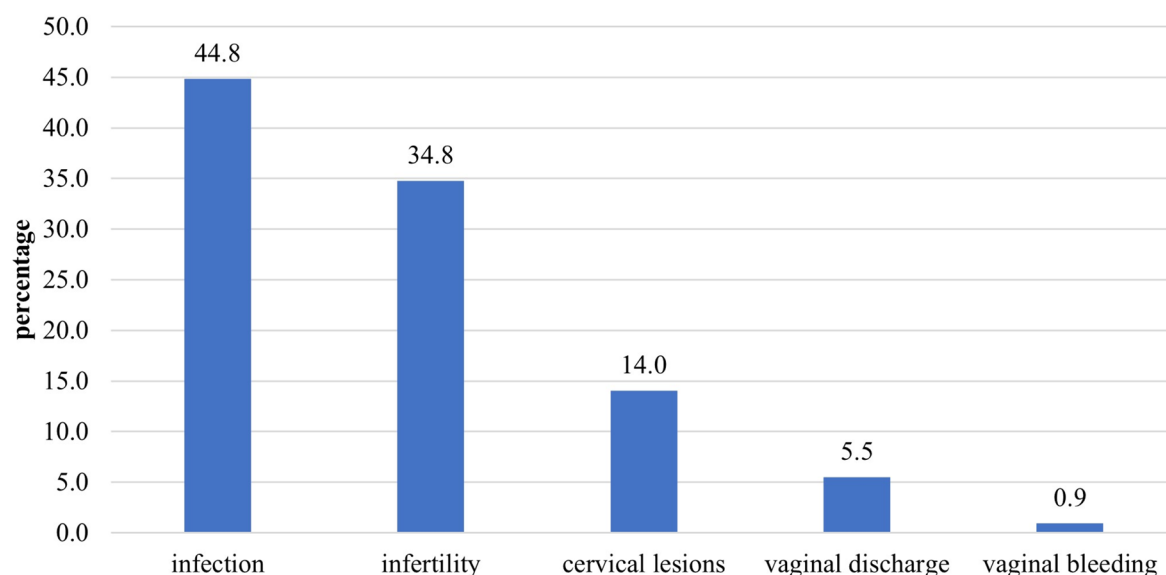


**Fig. 1.** Study follow diagram.

Variables	Cauterized, N (%)	Non-cauterized, N (%)
Age (in years)*	34(30–38)	26(23–30)
Gravida*	3(1–5)	3(1–5)
Parity*	3(1–5)	3(1–6)
Educational status		
Uneducated	183(55.8)	279(74.6)
Primary	43(13.1)	29(7.8)
Secondary	77(23.5)	47(12.6)
University	25(7.6)	19(5.1)
Residence		
Urban	168(51.2)	282(75.4)
Rural	160(48.80)	92(24.6)
Socioeconomic status		
Low income	236(72)	330(88.2)
Middle income	91(27.7)	38(10.2)
High income	1(0.3)	6(1.6)
Gestational weeks		
Term	143(43.6)	298(79.7)
Preterm	123(37.5)	44(11.8)
Abortion	62(18.9)	32(8.6)
Mode of delivery		
Normal delivery	232 (33)	256 (36.5)
Cesarean section	96 (13.7)	118 (16.8)
History of traditional cauterization	328 (46.7)	374 (53.3)
Attitude of cauterization		
Harmful	184 (26.2)	345 (49.1)
Useful	144 (20.5)	29 (4.1)

**Table 1.** Patient characteristics stratified by prior traditional cervical cauterization procedure (n = 702). \*Non-normal variables were expressed as median with inter-quartile range.

44.8% and 34.8%, respectively. Figure 2 displays the indication of traditional cervical cauterization among 328 females. Most women in the study participants considered cauterization harmful (n = 529, 75.4%), whereas nearly a quarter of them thought it was a helpful procedure (n = 173, 24.6%). The median number of cauterizations was 1 (IQR = 1–2). In addition, Most of the cauterizations were performed by traditional birth attendants (TBA) (n = 213, 65.0%).



**Fig. 2.** Indications of traditional cervical cauterization (n = 328).

Metal rods were used in 86.4% of traditional cervical cauterization cases, and nearly half (46.6%) of participants stated that traditional practitioners treated different patients with the same cauterant during their sessions (Table 2).

Women with prior traditional cervical cauterization were significantly older, uneducated, and from low-income families ( $P < 0.001$ ). The odds of traditional cervical cauterization were found to be 2.2 times higher among women aged 30 and above compared to women aged below 30 (OR = 2.27, 95% CI 1.46–3.53).

There was a significant association between a history of traditional cervical cauterization and the risk of preterm birth. Women with a history of cauterization had a higher risk of preterm birth than non-cauterized women (37.5% vs. 11.8%,  $P < 0.001$ ). In terms of timing of delivery, Women with a prior traditional cervical cauterization were two and half times more likely to deliver a preterm fetus (OR: 2.64, 95% CI 2.15–3.33) compared to non-cauterized mothers. Furthermore, the odds of full-term pregnancy among those who had undergone cauterization were 78% lower than those without cauterization (OR: 0.19; 95% CI 0.14–0.27). The association of traditional cervical cauterization with pregnancy outcomes is depicted in Table 3.

Regarding the different modes of delivery between the groups, approximately 70% of the study participants including cauterized ( $n = 232$ , 33%) and non-cauterized ( $n = 256$ , 36.5%) mothers delivered through the vaginal route. In addition, 214 (30%) of the study population delivered through C-section. Of these 96 (45%) had prior traditional cervical cauterization. However, although these findings are clinically significant, these numbers were not enough to show a statistically significant association between prior traditional cervical cauterization and C-section delivery (OR: 0.91, 95% CI 0.65–1.24,  $P = 0.512$ ).

According to the number of cauterization, there was a statistically significant increased risk of preterm birth in women who had cauterization two, three, and four times compared to those who never had prior traditional cervical cauterization or underwent only once (52.7%, 63.6%, and 66.7% vs 11.8%, and 29.7%,  $p < 0.001$ ). Spearman correlation showed a moderate negative correlation between the gestational weeks (Term, preterm, and abortion) and the number of cauterizations ( $r_s = -0.384$ ,  $p < 0.001$ ) (Fig. 3).

## Discussion

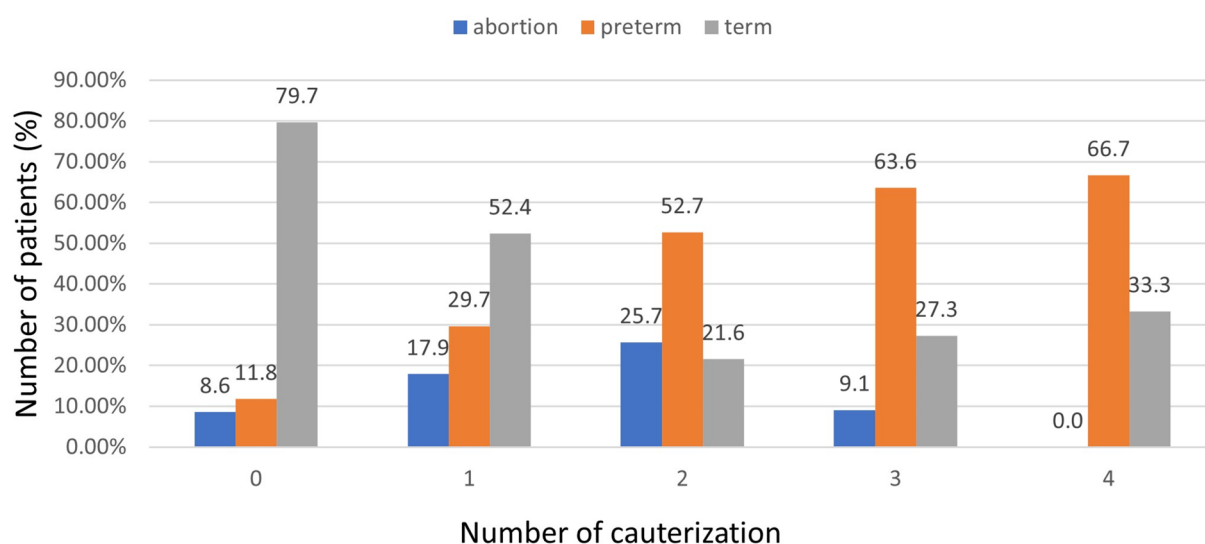
Cauterization, a traditional treatment method, is widely used by most Somali people for their primary health-care needs. However, this traditional medicine has yet to receive sufficient attention, and neither its therapeutic potential nor its adverse effects have undergone in-depth scientific research<sup>16</sup>. Therefore, this research investigated

Characteristics	Response	Frequency (N)	Percentage (%)
Perception of traditional cervical cauterization	Harmful	184	56.1
	Useful	144	43.9
Who did the procedure?	TBA	231	70.4
	Midwife	74	22.6
	Doctor	23	7
	Others	0	0
Who encourages you to do the procedure	Friends	184	56.1
	Family members	68	20.7
	Health workers	32	9.8
	Advertisements	44	13.4
Indications for traditional cervical cauterization	Infection	147	44.8
	Infertility	114	34.8
	Others	67	20.4
Instruments used for traditional cervical cauterization	Hot metal rods	283	86.3
	Knives	27	8.2
	Fire	18	5.5
Complications of traditional cervical cauterization	Infections	154	47
	Cervical/vaginal stenosis	123	37.5
	Others	51	15.5
Reason for community acceptance of traditional cervical cauterization	Religious beliefs	119	36.3
	Community experiences	85	25.9
	Culture	124	37.8
Number of times cauterization is applied	One time	216	65.9
	Two times	97	29.6
	More than 2 times	15	4.5
Would you advise others to practice this traditional cauterization?	Yes	144	56.1
	No	184	43.9

**Table 2.** Experience, knowledge, and attitude characteristics of patients who underwent traditional cervical cauterization (N = 328).

Variables	Cauterized %		Odd ratio	95% CI	P value
	Yes	No			
Maternal age					
< 30	106	279	2.27	1.46–3.53	*0.000
> 30	222	95			
Parity					
1	101	93	0.96	0.91–1.02	0.154
2	55	62			
≥ 3	172	219			
Educational status					
Uneducated	214	225	1.44	1.24–169	*0.000
Primary	43	67			
Secondary	46	63			
University	25	19			
Socioeconomic status					
Low income	246	199	0.67	0.51–0.88	*0.004
Middle income	75	134			
High income	7	41			
Residence					
Urban	242	285	1.14	0.81–1.60	0.459
Rural	86	89			
Gestational weeks					
Term (> 37)	143	298	2.64	2.15–3.33	*0.000
Preterm (24–37)	123	44			
Abortion (< 24)	62	32			
Mode of delivery					
Normal delivery	232	256	0.91	0.65–1.24	0.512
Cesarean section	96	118			

**Table 3.** Factors associated with traditional cervical cauterization. *CI* confidence interval. \*Significant at  $p < 0.05$ .



**Fig. 3.** Correlation between maternal gestational weeks (term, preterm, and abortion) and the number of cauterizations.

whether traditional cervical cauterization procedures were associated with adverse pregnancy outcomes in a tertiary hospital in Somalia.

The use of traditional cervical cauterization for therapeutic purposes is widespread among Somali people. This study found that the practice of traditional cervical cauterization was prevalent among patients visiting MSTREH (46.7%). As more than half of the participants in this study were illiterate, the higher prevalence of traditional cervical cauterization could be attributed to a lack of community awareness. Cultural and religious beliefs, the availability and popularity of an increased number of traditional healers in the community, and the population's belief that traditional cauterization is effective are all factors that could contribute to the high prevalence of traditional cauterization among the study population.

In addition to deeply ingrained beliefs, customs, and rational attitudes, a lack of knowledge and awareness of the consequences of these practices contribute to the persistence of these issues.

In the present study, we found that most women with prior traditional cervical cauterization were older, uneducated, and from low-income families. Berhe Tesfai et al. and Farid et al. stated that traditional cauterization was more common among non-educated and poor patients<sup>5,6</sup>. Another study carried out on Muslim Bedouin patients who visited clinics in southern Israel revealed that elderly members of the population (61 years of age and above) underwent traditional cauterization more than the younger ones<sup>9</sup>.

The majority of women in our study considered cauterization as harmful. According to a study conducted in Eritrea<sup>5</sup>, approximately one in ten traditional cauterization patients experienced treatment complications. Another study<sup>6</sup> discovered that 63.5% of participants experienced negative side effects and complications after cauterization. A more recent study about Traditional cauterization among children in Bint Al-Huda Hospital in Al-Nasiriya City, Iraq<sup>10</sup> found that approximately 59% of patients did not improve or worsened, 30% showed partial improvement, and 11% improved. The main indications for cauterization among the study population were infections of the uterine cervix and infertility. The belief that cauterization is effective against infections of the cervix and infertility is common among the Somali population. The belief is that intense heat destroys the harmful substances inside the body<sup>2</sup>.

Our study found that significant Association between prior traditional cervical cauterization and the risk of preterm birth. Our results showed that in patients with traditional cervical cauterization, particularly those with more than one session, the risk of preterm birth is higher than that of women without traditional cervical cauterization. Several studies found an association between procedures that breach the integrity of the cervix, including prior cervical excisional procedures, cauterization/ablation, and curettage, with adverse pregnancy outcomes, including preterm birth<sup>17–25</sup>. However, based on our data, we were unable to prove whether this risk of preterm birth in patients with prior traditional cervical cauterization is due to the cellular disruption caused by cauterization or other lifestyle factors.

Although the present study focused only on patients with a history of traditional cervical cauterization and its complications; however, we observed that most study populations had other body parts cauterized, including the upper extremities, head, lower extremities, and abdomen, for different reasons. Harmful traditional practices (HTP) continue to have a disastrous impact on Somalia, particularly on the health and social circumstances of mothers and children. These harmful traditional practices include female genital mutilation, early marriage, and cauterization<sup>2</sup>. Due to their low social status, women and girls in Sub-Saharan African countries, including Somalia, bear the brunt of the most harmful traditional practices. The socioeconomic status of women in society and poverty are both strongly correlated with all types of HTPs. Poor women and girls are typically more susceptible to HTPs and their harmful effects, including cauterization, and female genital mutilation<sup>1,25</sup>.

There are limitations to this study, although our study found an association between traditional cervical cauterization with adverse pregnancy outcomes, we could not prove whether this risk is due to the cellular damage caused by cauterization or other underlying factors, more research is needed to prove these findings. In addition, the study was carried out in a single facility, which lacks generalizability to the Somali population; also, our study has other limitations and a potential source of bias due to the interview-based data collection method. Conversely, it is important to highlight the strength that our study represents the first reported data regarding the association between traditional cervical cauterization and preterm birth in Somalia.

## Conclusion

Our study results suggest that traditional cervical cauterization procedures significantly increase the risk of preterm births, particularly when the number of cauterizations increases. Health professionals, especially those close to the community, should play a significant role in designing and implementing strategies to eradicate HTPs in Somalia to avoid and end this harmful traditional practice.

## Data availability

Data included in the manuscript.

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## Author contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

## Competing interests

The authors declare no competing interests.

## Institutional review board statement

The Mogadishu Somalia Turkish Training and Research Hospital Clinical Research Ethics Committee were approved for this study (approval number MSTH/7891). All methods were performed in accordance with the relevant guidelines and regulations.

## Informed consent statement

All study participants consented to use their medical and surgical data in this study.

## Additional information

**Correspondence** and requests for materials should be addressed to A.I.H.

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