





CLINICAL ARTICLE

Gynecology

Incidence and causes of severe maternal outcomes in Somaliland using the sub-Saharan Africa maternal near-miss criteria: A prospective cross-sectional study in a national referral hospital

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Abstract

Objective: To describe the incidence and causes of severe maternal outcomes and the unmet need for life-saving obstetric interventions among women admitted for delivery in a referral hospital in Somaliland.

Methods: A prospective cross-sectional study was conducted from April 15, 2019 to March 31, 2020, with women admitted during pregnancy or childbirth or within 42 days after delivery. Data were collected using the World Health Organization (WHO) and sub-Saharan Africa (SSA) maternal near-miss (MNM) tools. Descriptive analysis was performed by computing frequencies, proportions, and ratios.

Results: The MNM ratios were 56 (SSA criteria) and 13 (WHO criteria) per 1000 live births. The mortality index was highest among women with medical complications (63%), followed by obstetric hemorrhage (13%), pregnancy-related infection (10%), and hypertensive disorders (7.9%) according to the SSA MNM criteria. Most women giving birth received prophylactic oxytocin for postpartum hemorrhage prevention (97%), and most laparotomies (60%) for ruptured uterus were conducted after 3 h.

Conclusion: There is a need to improve the quality of maternal health services through implementation of evidence-based obstetric interventions and continuous in-service training for healthcare providers. Using the SSA MNM criteria could facilitate such preventive measures in this setting as well as similar low-resource contexts.

KEYWORDS

low-income country, maternal death, Sub-Saharan Africa criteria, WHO maternal near-miss

Jama Ali Egal and Jonah Kiruja are joint first authors.

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1 | INTRODUCTION

Reducing maternal morbidity and mortality remains one of the greatest challenges in low-resource settings, such as Somaliland. Despite progress made through programmes implemented by government ministries and private and non-governmental organizations to reduce maternal mortality ratios (MMRs) and achieve the United Nations' Sustainable Development Goal of fewer than 70 deaths per 100 000 live births by 2030, the MMR remains relatively high in sub-Saharan Africa (SSA).¹ In Somaliland, an estimated 732 maternal deaths occur per 100 000 live births, resulting in one of the highest MMRs in the world.^{2,3}

Women who fulfill the World Health Organization (WHO) and SSA maternal near-miss (MNM) criteria—that is, they develop severe complications during pregnancy or childbirth or within 42 days after the termination of pregnancy and nearly die—share many pathologic and circumstantial factors.^{4,5} Hence, much can be learned from them about the care of pregnant women. Consequently, WHO developed the MNM approach, a guide for monitoring the implementation of critical interventions in maternal health care and systematically assessing the quality of care.⁵ Studies conducted in Bolivia, Tanzania, and Ethiopia have shown that it is useful for identifying shortfalls in clinical practice and the referral system and can be used to improve quality of care and maternal and newborn outcomes.^{6–8}

A pilot study conducted in 2015 using a modified MNM approach showed that most of the women with severe complications were diagnosed with preventable and treatable conditions; however, a large proportion (one out of eight) of cases resulted in maternal death.⁹ The WHO MNM criteria have since been adapted for use in SSA,⁴ increasing their applicability in settings with low availability of blood transfusions, intensive care units (ICUs), and laboratory-testing equipment. These SSA criteria are used to accurately record near-miss cases and create comparable data sets in the region, especially in the fragile Somaliland context.⁴ Using both the WHO and SSA MNM criteria, the present study aimed to describe the incidence and causes of severe maternal outcomes and measure the unmet need for life-saving obstetric interventions among women admitted for delivery in a referral hospital in Somaliland.

2 | MATERIALS AND METHODS

A prospective cross-sectional study was conducted at the National referral hospital in Somaliland Hargeisa Group Hospital (HGH) from April 15, 2019 to March 31, 2020.

HGH is located in Hargeisa, the capital of Somaliland, and serves as the main tertiary and referral hospital for all Somaliland regions. The majority of the 3.5 million inhabitants have a low socioeconomic background. Around 48% of women receive antenatal care from a trained healthcare provider,¹⁰ but only 33% of deliveries are conducted by skilled birth attendants. Most women giving birth are supported at home by traditional birth attendants, who lack the competencies of formally trained maternity care providers.¹¹ HGH

provides delivery services to approximately 6000 mothers annually.³ The hospital has anesthetists, a blood transfusion center, a clinical laboratory, and an ICU. However, blood availability is insufficient, and family members are often requested to donate blood.³

All women admitted to the hospital's maternity wards during pregnancy or childbirth or within 42 days after delivery were included in the study. Women were screened using the SSA MNM criteria, which include cardiovascular, respiratory, renal, coagulation, hepatic, neurologic, and uterine dysfunction criteria as defined by WHO.⁵ They were also screened for severe pre-eclampsia upon ICU admission, eclampsia, sepsis, or severe systemic infections, pulmonary edema, transfusion of two or more units of red blood cells, uterine rupture, severe abortion complications, and laparotomy other than cesarean section.⁴ Moreover, women were included who had severe maternal outcomes, which is an extensive category of clinical conditions that includes diseases that can threaten a woman's life during pregnancy and labor and after the termination of pregnancy.⁴ All maternal deaths during the study period, as defined by WHO,⁵ were also included.

Women were recruited at the HGH labor ward, ICU, operating rooms, and two gynecology wards. The data collection tool was attached to each woman's medical file upon admission, the assigned midwife commenced documentation in the tool, and data were extracted from the medical file to the paper-based tool. At every stage of the woman's stay, a trained data collector updated the tool. J.E. and J.K. regularly reviewed all the completed tools and medical records to ensure completeness. Data collectors visited the wards at the start of every shift, checked that there were sufficient tools available, collected the completed tools, and double-checked them against the admission and discharge information in the hospital system. Data were entered into SPSS version 22 software (IBM) daily by J.E. and J.K., who were assisted by trained data entry persons. Interim analysis of entered data was performed on a quarterly basis. This provided opportunities to identify missing data and variables and to discuss with the data collector's ways to improve data quality.

Each medical record was assessed by an obstetrician/gynecologist and the data collectors to determine whether the woman fulfilled the WHO and/or SSA MNM criteria. The variables studied were sociodemographic characteristics, obstetric history, screening questions, process indicators on proportion of women receiving recommended evidence-based interventions, and underlying causes of MNM and death. The women were classified into the following categories: (1) women with complications (diagnosed with any disease or condition irrespective of its severity), (2) women with potentially life-threatening conditions (diagnosed with severe maternal complications that can threaten a woman's life during pregnancy, birth, and after the termination of pregnancy), (3) women with MNM (including both WHO and SSA criteria), and (4) maternal death.

Data were cleaned, checked for completeness and analyzed using descriptive statistics. The following MNM and mortality indicators were calculated as described by WHO⁴: MNM ratio (MNM/1000 live births), maternal death ratio (maternal deaths/100 000 live births), severe maternal outcomes (MNM+maternal deaths), severe

maternal outcome ratio (MNM+maternal deaths/1000 live births), MNM/maternal death ratio (MNM:1 maternal death), and mortality index (maternal deaths/(MNM+maternal death). The underlying causes of MNM and maternal mortality and the use of evidence-based interventions among women with severe maternal complications⁴ are described using percentages.

Permission to conduct the study was obtained from the Somaliland Ministry of Health Development. Ethical clearance was provided by the research ethics committee of the University of Hargeisa (Dr: CS/41105/18).

3 | RESULTS

A total of 6658 women were admitted to the obstetrics unit from April 15, 2019 to March 31, 2020. During the follow up from admission to discharge, 1864 women had complications and 923 women had potentially severe maternal complications. The WHO MNM criteria identified 79 women with MNM, and the SSA criteria identified 342 women with MNM (Figure 1). There were 28 maternal deaths, after excluding one maternal death that was the result of a road traffic accident.

The participants' sociodemographic and obstetric characteristics are presented in Table 1. With a total of 6055 live births during the study period, the MNM ratios were 56.5/1000 live births (SSA MNM criteria) and 13/1000 live births (WHO MNM criteria) (Table 2). The MMR was 462/100 000 live births. Figure 2 illustrates the distribution of women who met the SSA and WHO MNM criteria. Blood transfusion of two or more units ($n = 221$), eclampsia ($n = 54$), and cardiovascular dysfunction ($n = 44$) were the most common SSA MNM criteria fulfilled, while transfusion of more than five units ($n = 36$) of blood, cardiovascular dysfunction ($n = 44$), and neurologic dysfunction ($n = 23$) were the most common WHO MNM criteria fulfilled.

The mortality index according to the SSA MNM criteria was highest among those with medical complications (8; 63%) considered indirect obstetric causes, such as pneumonia and severe hypothyroidism, followed by obstetric hemorrhage (104; 13%), pregnancy-related infections (29; 10%), and hypertensive disorders (89; 7.9%) (Table 3). The use of evidence-based obstetric interventions varied depending on the type of intervention (Table 4). Almost all women giving birth received prophylactic oxytocin for prevention of postpartum hemorrhage (6268; 97%), but only half of the women who underwent cesarean section received prophylactic antibiotics within the recommended time. Likewise, all women with eclampsia received magnesium sulfate, but the majority of laparotomies (12; 60%) for ruptured uterus were conducted after 3 h of hospital stay.

4 | DISCUSSION

This is the first study in the Somali region that has assessed and shown that the SSA MNM criteria identify more MNM cases than the WHO MNM criteria. In an international comparison, we found a high incidence of severe maternal outcomes and a high MMR and maternal mortality index. The findings showed high use of evidence-based interventions, such as the use of oxytocin for the prevention of postpartum hemorrhage and magnesium sulfate in eclampsia, which was optimal. However, immediate laparotomies were not performed in cases of ruptured uterus because of delays.

The SSA MNM ratio reported here is similar to those reported in Namibia, Tanzania, and Ethiopia¹¹⁻¹³; however, it is higher than in studies conducted in Kenya, Nigeria and Suriname.¹⁴⁻¹⁷ The variation could be the result of differences in study populations or the types of healthcare facilities in which the studies were conducted.

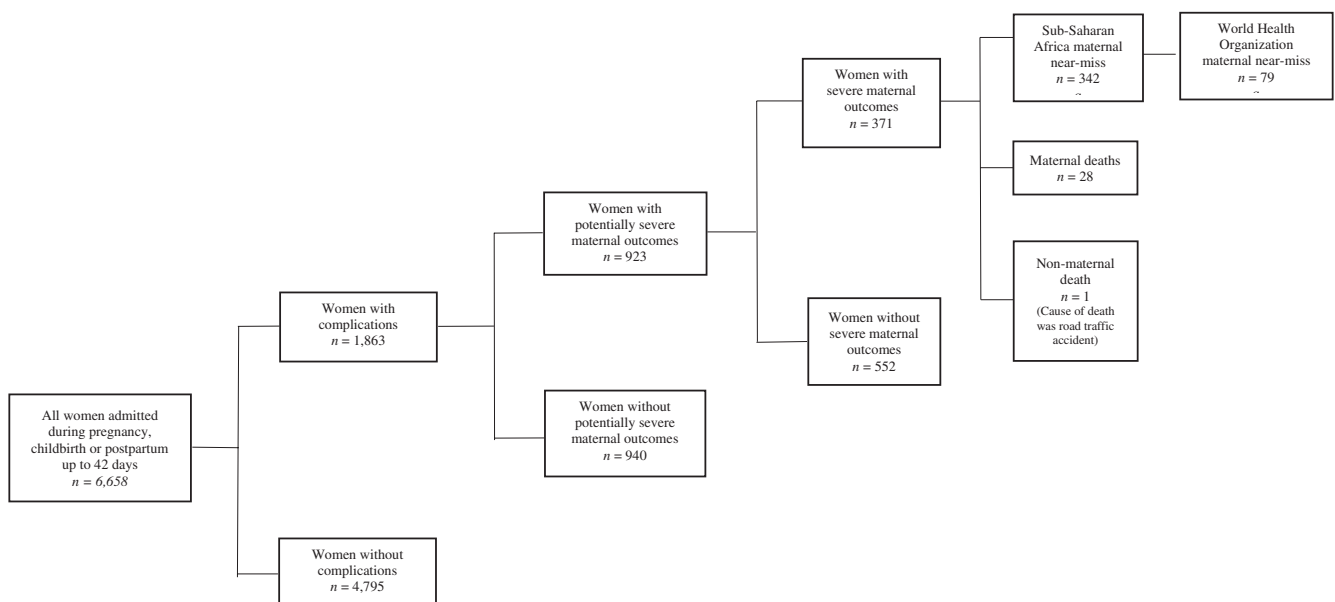


FIGURE 1 Flow chart of inclusion of study participants using sub-Saharan Africa criteria for maternal near-miss.

TABLE 1 Sociodemographic and obstetric characteristics of women with no maternal near-miss or death, women with maternal near-miss and women who were maternal deaths at the national referral hospital, Somaliland^a

Characteristic	No maternal near-miss or death (n = 6287)	Sub-Saharan Africa maternal near-miss (n = 342)	Maternal death (n = 28)	Total cohort (n = 6657)
Age, years				
<20	1151 (18.3)	69 (20.2)	2 (7.1)	1222 (18.4)
20–34	3976 (63.2)	206 (60.2)	19 (67.9)	4201 (63.1)
≥35	1160 (18.5)	67 (19.6)	7 (25.0)	1234 (18.5)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Education				
No formal education	3816 (60.7)	246 (71.9)	21 (75.0)	4083 (61.3)
Primary and secondary school	2233 (35.5)	89 (26.0)	7 (25.0)	2329 (35.0)
University	238 (3.8)	7 (2.1)	0 (0.0)	245 (3.7)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Residence				
Rural area	428 (6.8)	58 (17.0)	6 (21.4)	492 (7.4)
Urban area	5859 (93.2)	284 (83.0)	22 (78.6)	6165 (92.6)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Gestational age at delivery, week				
<22	174 (2.8)	39 (11.4)	0 (0.0)	213 (3.2)
22–36	284 (4.5)	57 (16.7)	8 (28.6)	349 (5.2)
37–42	5828 (92.7)	246 (72.9)	20 (71.4)	6094 (91.6)
>42	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Parity				
0–para	1035 (16.5)	54 (15.8)	6 (21.4)	1095 (16.3)
1–4	3750 (59.6)	184 (53.8)	12 (42.9)	3946 (59.4)
>4	1502 (23.9)	104 (30.4)	10 (35.7)	1616 (24.3)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Previous cesarean section (among multipara)^b				
Yes	669 (11.2)	72 (25.0)	4 (18.1)	745 (13.4)
No	4583 (88.8)	216 (75.0)	18 (81.8)	4817 (86.6)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Female genital cutting				
Pharaonic	2948 (46.9)	229 (67.0)	23 (82.1)	3200 (47.9)
Sunna and other types and no female genital cutting	3339 (53.1)	113 (33.0)	5 (17.9)	3457 (52.1)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Referral				
Traditional birth attendant	11 (0.2)	10 (2.9)	1 (3.6)	22 (0.3)
Healthcare providers at maternal and child health centers	106 (1.7)	38 (11.1)	5 (17.9)	149 (2.2)
Self-referred	6170 (98.1)	294 (86.0)	22 (88.6)	6486 (97.5)
Missing	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mode of delivery				
Vaginal delivery	4914 (78.1)	121 (35.6)	13 (46.4)	5048 (76.0)

(Continues)

TABLE 1 (Continued)

Characteristic	No maternal near-miss or death (n = 6287)	Sub-Saharan Africa maternal near-miss (n = 342)	Maternal death (n = 28)	Total cohort (n = 6657)
Cesarean section	1088 (17.3)	158 (46.2)	9 (32.2)	1255 (18.8)
Discharged/died while still pregnant ^c	139 (2.2)	24 (7.0)	6 (21.4)	169 (2.5)
Laparotomy for ectopic pregnancy	0 (0.0)	7 (2.0)	0 (0.0)	7 (0.1)
Dilatation and curettage	32 (0.5)	20 (5.8)	0 (0.0)	52 (0.8)
Complete spontaneous abortion	114 (1.8)	126 (3.5)	0 (0.0)	240 (1.9)

^aData are presented as number (percentage).

^bNulliparous not included in the analysis.

^cThese women recovered and were sent home.

TABLE 2 Maternal near-miss and maternal death indicators^a

Indicator	Incidence according to sub-Saharan Africa maternal near-miss criteria	Incidence according to World Health Organization maternal near-miss criteria
Live births	6055	6055
Maternal near-misses	342	79
Maternal near-miss ratio	56.5 per 1000 live births (95% CI 50.8–62.8)	13 per 1000 live births (95% CI 10.3–16.2)
Maternal deaths	28	28
Maternal death ratio ^a	462 per 100000 live births (95% CI 310–670)	462 per 100000 live births (95% CI 310–670)
Severe maternal outcomes (maternal near-misses and maternal deaths)	370	107
Severe maternal outcome ratio	61.1 per 1000 live births (95% CI 55.2–67.4)	17.7 per 1000 live births (95% CI 14.5–21.3)
Maternal near-miss/maternal death ratio	12.2:1	2.8:1
Mortality index ^b	7.6% (95% CI 5.1–10.7)	26% (95% CI 18.4–35.6)

Abbreviation: CI, confidence interval.

Note. Data are presented as number (percentage).

^aThere were 29 maternal deaths; however, one maternal death was excluded (cause of death was road traffic accident).

^bMortality index = Maternal death/maternal near-miss+maternal death.

In our study setting, the SSA MNM criteria identified more MNM cases than the WHO MNM criteria. The major reasons for this disparity are the different thresholds for blood transfusion units and the additional criteria of eclampsia and sepsis. This finding is in line with that of a previous study conducted in Ethiopia.⁷ Using a lower threshold for blood transfusion units is appropriate in low-resource settings, given the blood shortages often reported in such contexts.¹⁸ The SSA criteria were developed to address the WHO's inclusion of criteria that require sophisticated laboratory equipment and management, which are unfeasible factors in many low-resource settings in SSA. As such, the SSA MNM criteria allow identification of prognostic factors as a foundation to intervene earlier and prevent severe morbidity and mortality⁴ in settings such as Somaliland. Arguably, using the SSA MNM criteria as a tool for analyzing maternal near-miss cases identifies a larger proportion of women with life-threatening conditions and so captures a more accurate picture of maternal morbidity in this setting than using the WHO criteria.¹⁸ As such, this higher ratio of MNM should be used for identifying MNM cases and implementing

preventive measures to improve quality of care in a low-resource setting such as Somaliland. For example, the present study reports more women with eclampsia and hemorrhage using the SSA MNM criteria, which calls for hospital management to allocate resources for the implementation of evidence-based obstetric interventions through reviewing and updating care guidelines and continuous in-service training for healthcare providers.¹⁸

In terms of intrahospital evidence-based interventions for preventing maternal morbidity and mortality, we found that the use of oxytocin to prevent obstetric hemorrhage was remarkably high: 97% of women giving birth at the health facility received oxytocin prophylaxis. Moreover, all women with eclampsia received magnesium sulfate as an anticonvulsant. The Somaliland Ministry of Health Development has been scaling up evidence-based interventions through training of healthcare providers in the referral hospital, providing a new building for the obstetrics department and allocating resources for emergency obstetric care. In comparison to our previous findings,⁹ more effort has been made in terms of drugs, equipment, and staff. The effective management

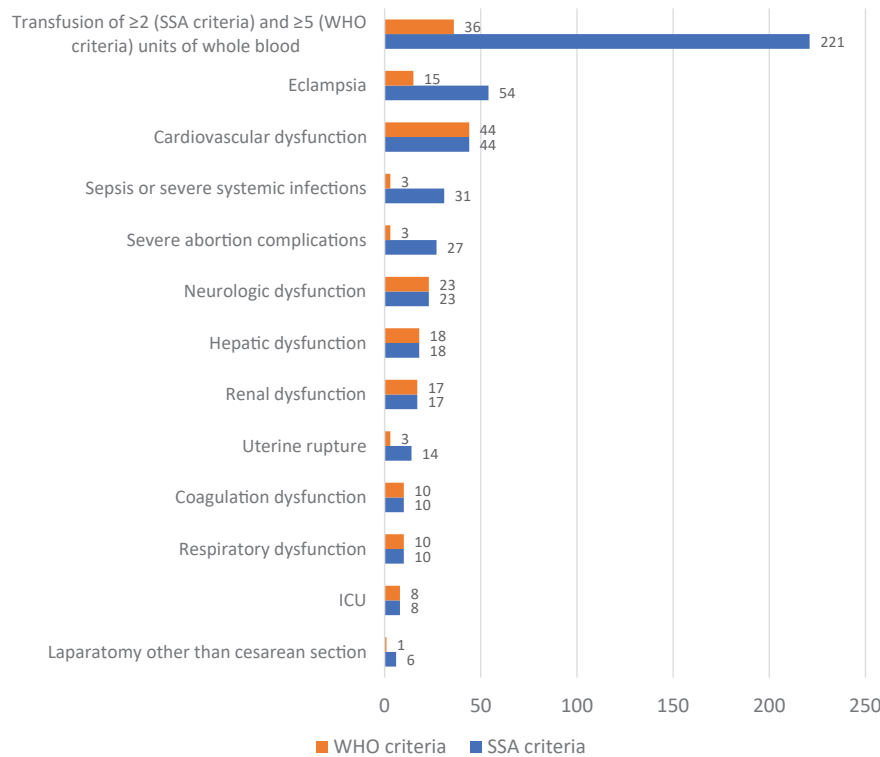
Inclusion criteria according to the SSA^a and WHO criteria

FIGURE 2 Maternal near-miss criteria fulfilled according to the sub-Saharan Africa (SSA) and World Health Organization (WHO) criteria. Inclusion criteria were according to the SSA^a and WHO criteria. ^aTotal number of SSA maternal near-miss events exceeds 342 because some women fulfilled more than one criterion; number of women with maternal near-miss ($n = 342$) and number of maternal near-miss events ($n = 483$); number of women with WHO maternal near-miss ($n = 79$) and number of maternal near-miss events ($n = 191$).

TABLE 3 Causes of maternal near-miss and death and mortality index^a

Cause of maternal near-miss and mortality	Sub-Saharan Africa criteria			World Health Organization criteria		
	Maternal near-miss ($n = 342$)	Maternal death ($n = 28$)	Mortality index ^b	Maternal near-miss ($n = 79$)	Maternal death ($n = 28$)	Mortality index ^b
Direct obstetric causes						
Obstetric hemorrhage	91 (26.6)	13 (46.4)	12.5%	30 (38)	13 (46.4)	30.2%
Hypertensive disorders in pregnancy, childbirth, and the puerperium	82 (24)	7 (25)	7.9%	40 (51)	7 (25)	14.9%
Pregnancies with abortive outcome	32 (9.4)	0 (0)	0.0%	3 (4)	0 (0)	0.0%
Pregnancy-related infection	26 (7.6)	3 (10.7)	10.3%	3 (4)	3 (10.7)	50.0%
Indirect obstetric causes						
Severe anemia	108 (31.6)	0 (0)	0.0%	0 (0)	0 (0)	0.0%
Medical complications ^c	3 (0.9)	5 (17.9)	62.5%	3 (4)	5 (17.9)	62.5%

^aData are presented as number (percentage).

^bMortality index = $([\text{Maternal death}/(\text{Maternal near-miss} + \text{Maternal death})])$ expressed as a percentage.

^cMedical complications diagnosis for maternal near-miss = pneumonia (2) and severe hypothyroidism, medical complications for maternal deaths = pulmonary embolism, postpartum psychosis, acute pyelonephritis, human immunodeficiency virus infection, and pneumonia.

of obstetric hemorrhage and hypertensive disorders is evidenced by lower mortality indexes from these direct obstetric causes of maternal death.

In contrast, only half of the women who delivered through cesarean section received prophylactic antibiotics, as recommended by WHO. Prophylactic antibiotics are a key intervention in preventing

TABLE 4 Process and outcome indicators associated with specific conditions

Indicator	n	%
1. Prevention of postpartum hemorrhage		
Target population: women giving birth in healthcare facilities (22 weeks of pregnancy or more)	6442	100
Oxytocin use ^a	6268	97.3
Use of any uterotonic (including oxytocin)	6442	100
2. Treatment of severe postpartum hemorrhage		
Target population: women with severe postpartum hemorrhage	98	100
Oxytocin use ^a	83	84.7
Use of any uterotonics (including oxytocin)	98	100%
Tranexamic acid	14	14.3
Removal of retained products	3	3.1%
Proportion of cases with severe maternal outcome ^b	57	58.2%
Mortality	7	7.1%
3. Anticonvulsants for eclampsia		
Target population: women with eclampsia	57	100.0%
Magnesium sulfate ^a	57	100.0%
Other anticonvulsant	17	29.8%
Use of any anticonvulsant	57	100.0%
Proportion of cases with severe maternal outcome ^b	57	100.0%
Mortality	3	5.3%
4. Prevention of cesarean section-related infection		
Target population: women undergoing cesarean section	1246	100.0%
Prophylactic antibiotic during cesarean section ^a	628	50.4%
Prophylactic antibiotic after cesarean section	618	49.6%
5. Treatment for sepsis		
Target population: women with sepsis	35	100.0%
Parenteral therapeutic antibiotics ^a	35	100.0%
Proportion of cases with severe maternal outcome ^b	29	82.9%
Mortality	3	8.6%
6. Ruptured uterus		
Target population: women with ruptured uterus	20	100.0%
Laparotomy	19	95.0%
Laparotomy after 3 h of hospital stay	12	60.0%
Proportion of cases with severe maternal outcome ^b	20	100.0%
Mortality	6	30.0%

^aPrimary indicator, based on the first option evidence-based intervention for the target population.

^bInclusion criteria of the cases as per the definition of severe maternal outcome = maternal near-miss plus maternal death.

surgical-site infections that can lead to severe sepsis and death.⁶ This finding shows the need for healthcare providers to be trained on the importance of administering prophylactic antibiotics in cesarean section and following guidelines as part of regular care.

Moreover, most women with ruptured uteruses underwent laparotomy after 3 or more hours of hospital stay, which is in contrast to the findings of an Iraqi study.¹⁹ The delay in service provision, which poses a threat to women's health, may be associated with the consent process. In Somaliland, consent for interventions, such as laparotomy and cesarean section, must be obtained from both the woman's husband and father. This can delay the provision of medical care according to healthcare providers at the referral hospital (J. Kiruja, B. Essén, K. Erlandsson, M. Klingberg-Allvin, & F. Osman, unpublished data).

The present study has shown that at HGH, around 70% of women gave birth without complications and that most women bypassed the primary healthcare level (self-referred) during the study period. In Somaliland, most women (80%) deliver at home supported by a traditional birth attendant and the rest deliver at a healthcare facility.²⁰ This indicates that a considerable proportion of women with normal pregnancies and uncomplicated deliveries attend the referral hospital instead of a primary healthcare center, resulting in overcrowding and suboptimal care. A recent qualitative study among multiparous women in Somaliland found that a lack of reproductive agency in facility-based births makes home births their first choice, regardless of medical need.²⁰ Inadequate quality of care for women and neonates in low- and middle-income countries is evident, and different solutions have been proposed, such as scaling up access to hospital care.²¹ However, to meet women's needs and preferences in Somaliland, further investments are needed to strengthen the midwifery profession and to define and test a scalable, context-specific, midwife-led continuity of care model.²² A model that integrates women's needs and continuity of care through pregnancy and delivery led by midwives working in interprofessional teams is a cost-effective solution.^{23,24}

The strengths of the present study include its large sample size. The present study applied a quality data control mechanism during data collection, and the prospective approach enabled any vital data not captured in the MNM tool to be included by the time of discharge. However, a limitation of the present study is that the findings might not be generalizable to the population of Somaliland, as the study was conducted in the national referral hospital, which has highly trained healthcare professionals. As such, interpretation of the findings might be limited to facilities managing high-risk patients in Somaliland. Moreover, given that the country has a low rate of hospital deliveries (33%) and home births were not included in this analysis, the indicators of maternal health (e.g. the MMR and MNM ratio) are not representative at the population level.

In the present study, the SSA MNM criteria identified more MNM cases than the WHO MNM criteria. Hence, they are an appropriate tool for accurate figures, analyzing near-misses and identifying new preventive measures. Progress has been made in the provision of intrahospital evidence-based obstetric interventions;

however, there is still a need to improve the overall quality of care to reduce maternal morbidity and mortality. The health authorities need to consider redesigning the healthcare system to increase antenatal care uptake and facility-based deliveries at primary healthcare centers with a functional referral system to higher-level care when needed. Evidence-based obstetric interventions provided by interprofessional teams are vital for reducing maternal mortality and morbidity, and the present study shows the need for continuous in-service training and a review of guidelines used at referral hospitals.

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Hargeisa Group Hospital staff in the obstetrics department and management. We declare that this is a plagiarism free article, and the present study was supported by the University of Hargeisa, Dalarna University and Uppsala University.

CONFLICT OF INTEREST

The authors have no conflicts of interest.

AUTHOR CONTRIBUTIONS

All the authors, JE, JK, HL, FO, KE, and MK, participated in the conception and design of the present study. JE and JK were responsible for training the data collectors, supervising the data collection, the initial data analysis, and the writing of the manuscript with support and guidance from HL, FO, KE, and MK. JE and JK cleaned the data file and contributed to the data analyses under supervision. All authors contributed to the interpretation of the results, to the revision of the manuscript and approval of the final manuscript.

DATA AVAILABILITY STATEMENT

Research data are not shared.

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