

Competence and Performance of the Skilled Birth Attendants to undertake Normal Delivery and Emergency Obstetric Care in Eritrea.

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Abstract

**Objective:** to determine the competence and performance of the skilled birth attendants and the quality of normal delivery and emergency obstetric services in Eritrea.

**Methods:** All of the 17 hospitals that provide maternity services and all of the 46 health centers in the country were included in this study. Quality or Quality gap was assessed through measuring the percentage of clients who got a service in compliance with the standards described in the national safe motherhood protocol.

**Findings:** The study revealed gaps in the competence and performance of the skilled health workers as well as in the quality of normal delivery and emergency obstetric services in the country. Among the quality gaps identified were poor monitoring of normal and complicated labor and lack of use of partographs.

**Conclusion:** The study concluded that in order to reduce maternal mortality in developing countries like Eritrea; it is not adequate to just increase the percentage of women who are attended by health professionals, it is also at least equally important to improve the skills and performance of the available birth attendants.

**Keywords:** Skilled birth attendant, traditional birth attendants, Emergency Obstetric Care, normal delivery, eclampsia/pre-eclampsia, obstructed labor, competence, skill maintenance.

Introduction

Although there is now a general trend of shifting from traditional birth attendants to trained health professionals “Skilled Birth Attendants”, it is imperative to assess and understand the level of skill among the health workers.

A skilled birth attendant is defined as a health worker with midwifery skills providing care for normal deliveries and basic Emergency Obstetric Care (EmOC) 1,2,3. Research shows that women’s lives can be saved and their suffering reduced if health systems could address serious and life-threatening complications of pregnancy and child birth when they occur. One of the best ways to do this is to make sure that women receive skilled care at delivery. Providing skilled care means ensuring that health professionals such as midwives, nurses or doctors can manage normal deliveries and treat life-threatening complications of pregnancy and childbirth. With support from functioning health and transportation systems, these professionals can treat or stabilize women and refer them for appropriate care 1,4 .

Pregnancy and delivery are normal physiological processes and the outcome of most pregnancies is good. However, all pregnancies involve some risk to the mother or infant and it is important to prevent, detect and manage complications early before they become life-threatening emergencies. This requires attendance of every delivery by a trained health worker, which is very low (28 percent) in Eritrea, as either TBAs (43 percent) or relatives and friends (27 percent) attend the majority of deliveries 5.

Materials and methods

All of the 17 hospitals that provide maternity services in Eritrea and all of the 46 health centers in Eritrea

were included in this study. As all hospitals and all health centers were included in this study, there was no sample size calculation for the different types of hospitals and the health centers in the country.

All of the 17 hospitals that provide maternity services (1 National referral hospital, 6 Zoba (Zonal) referral hospitals and 10 community hospitals), and all of the 46 Health Centers in the country were included in the study. Among the 21 hospitals in the country, 4 hospitals do not provide maternity services and were not included in the study. These include the two specialized hospitals, St. Mary psychiatry hospital and Berhan ophthalmic hospital as well as two general hospitals, namely Halibet hospital and Hazhaz hospital.

All hospitals that provide maternity services and all health centers were included in the study because the number of hospitals and health centers is manageable and inclusion of all of them provides adequate number of facilities that could enable us to disaggregate findings by facility or by Zoba. Additionally as most obstetric complications are treated in either hospitals or health centers and not in health stations, studying all hospitals and health centers provides a possibility of capturing almost all cases of obstetric complications who seek medical care.

The following data collection techniques were utilized in the study.

**RecordCardReview:** Patient’s management information was drawn from the individual record cards of the clients/patients. These include: -

- Antenatal record reviews, which were conducted to identify which key services, were provided to antenatal clients.
- Normal delivery record reviews, which were conducted to

assess the quality of care provided for normal deliveries.

- Complicated delivery record reviews that were conducted to assess the quality of care provided to patients with delivery complications involving eclampsia and obstructed labour.

**Interview with maternity staff:** Structured interviews with maternity staff (midwives and maternity nurses) were conducted to collect data on the number, qualifications, training, supervision and practices of the providers of delivery care at each health facility. Maternity staff workers (midwives and maternity nurses) were also interviewed to collect data on their competence and practices.

Normal delivery record cards from the health facilities were reviewed to assess the quality of care provided for normal deliveries. A rough assessment of the quality of care was made by comparing the actual practice as recorded in the cards with treatment norm or standard to actual practice as recommended in the national safe motherhood protocol. Quality gap is assessed through measuring the percentage of clients who got a service in compliance with the standards described in the national safe motherhood protocol, adapted from the WHO, Mother Baby package 1.

To assess the quality of the management of eclampsia/pre-eclampsia, Record cards that meet either of the following selection criteria were selected from the hospitals and the health centers for card review:

- eclamptic fits were recorded; or
- diastolic blood pressure (BP) was greater than or equal to 100 mmHg (for example 140/100 mmHg).

Hospital Delivery Records of clients who experienced obstructed labor were reviewed for indicators of good management of obstructed labor. The record cards selected meet either of the following selection criteria

- descent was static for three hours or more; or
- strong contractions with no progress for three hours.

### Description of the procedure of selection of Clients and Record Cards

First the minimum Required Number of Clients or record Cards (RNC) to be sampled from each individual health facility was calculated by dividing 153 to the number of health facilities in each type of facility (for national referral hospital  $153/1=153$ , for Zonal referral hospitals,  $153/6=25$ , for community hospitals  $153/10=15$ , for health centers  $153/46=4$  and for health stations  $86/41=4$ ). The sampling procedure is then followed as described for each item.

Record reviews: Patient/client record cards were reviewed for antenatal care and normal delivery in both hospitals and health centers while record cards for pre-eclampsia or eclampsia and obstructed labour among complicated deliveries were studied only in hospitals. Additionally register books or log books for antenatal, delivery, postpartum and family planning were also reviewed, as part of records review in both hospitals and health centers.

For the antenatal care record review, the Total Number of antenatal record Cards (TNC) available for visits that had taken place in the 12 months prior

to the study were counted. This number was then divided by the minimum Required Number of Cards (RNC) for the type of the facility, to get the sampling interval. One card was then pulled at each interval. For example, if a total of 300 cards were available for the year prior to the day of the visit in a Zonal Referral hospital, every twelfth card would be taken, after taking the first card at random (as RNC for Zonal hospital  $153/6=25$ , and  $300/25=12$ ). A separate data collection form was completed for each card and the relevant information for the most recent delivery on each card was recorded.

Data collectors were requesting the health facility staff to help them locate the delivery cards, "labourgraphs" or "partographs". The record cards for all deliveries that had taken place in the 12 months prior to the day of the study were then identified (found). Then for eclampsia the first records that meet either of the following selection criteria were selected (hence, no sampling interval was required in selecting the records): (1) eclamptic fits were recorded; or (2) diastolic blood pressure (BP) was greater than or equal to 100 mmHg (for example 140/100 mmHg). If less than the minimum Required Number of records (RNC) were available, then all available records that meet the selection criteria would be taken.

In the same manner for the record review of obstructed labour, the staff were asked to help locate the delivery cards, "labourgraphs" or "partographs". The record cards for all deliveries that have taken place in the 12 months prior to the day of the study were then identified (located). Then, the first records that meet either of the following selection criteria were selected (hence, no sampling interval was required in selecting the records): (1) descent was static for three hours or more; or (2) strong contractions with no progress for three hours. If less than the minimum Required Number of records (RNC) were available, all available records that meet the selection criteria would be taken.

If the number of clients on the day of the visit was less than or equal to double the minimum required number of clients, all of the clients were included, other wise a sampling interval (k) was calculated. The first client to be included among the first k clients was selected randomly, followed by every kth client. If the number of clients on the day of the visit was less than the minimum number required the interviewers had to come back to the health facility, until they got the minimum number required.

Interview with midwifery (maternity) staff: All midwives or maternity nurses/associate nurses present at each facility (the hospitals and the health centers) on the day of the visit were interviewed individually up to a maximum of five. If there were more than five maternity staff present (which was the case only in the national referral hospital), five of them were selected at random.

### Results

All of the 17 hospitals that provide maternity services and all of the 46 health centers in Eritrea were included

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Table 1: Number of different health providers interviewed and record cards reviewed and health facilities studied by facility type

Record cards or health providers	Total number studied
Antenatal record cards from hospitals and health centers	456
Normal delivery record cards from hospitals and health centers	701
Complicated delivery (Pre-eclampsia-Eclampsia) record cards from hospitals and health centers	165
Complicated delivery (Obstructed labor) record cards from hospitals only	347
Midwifery (Maternity) staff (nurses/midwives) in hospitals and health centers	170
Number of facilities sampled (n)	63 (17 hospitals and 46 health centers)

Normal Delivery: In order to assess the quality of care provided in health facilities for normal delivery, five indicators that were described in the Eritrean National safe motherhood protocol were used as depicted in Table 2. The table reveals serious deficiency in quality of care provided to women who deliver in health facilities.

As depicted in Table 2, vaginal examination was undertaken at least once every 4 hours only in 43 percent of the clients, while in 31 percent no vaginal examination was performed (or not recorded in the card) and only in 16 percent was fetal heartbeat monitored at least hourly, while in 32 percent it was not monitored (or not recorded) at all. Only in 6 percent was blood pressure monitored at least hourly, while in 30 percent it was not measured at all (or not recorded in the card). However, in the majority of the clients record cards birth weight (94 percent) and the

condition of the baby (90 percent) were recorded.

Table 2: Assessment of overall quality of normal delivery practice, using five indicators of performance

Action	Norm	According to norm	Not performed
Vaginal examination	At least once every 4 hours	43.1%	31.1%
Fetal heartbeat monitoring	At least hourly	16.0%	31.5%
Blood pressure monitoring		6.1%	30.2%
Birth weight recorded on card	Should always be recorded on card	93.7%	7.3%
Assessment of condition of baby recorded on card		90.1%	9.9%
Number of cards sampled	777		

Emergency Obstetric Care: As seen in Table 3, although both antihypertensive and sedative or anticonvulsive drugs were administered in almost all eclamptic patients (96.2 percent), use of drugs in pre-eclampsia mothers was low, no drug was administered in 32 percent of them. Monitoring of eclampsia and pre-eclampsia patients is found to be poor, as only in one fifth (22.3 percent) of patients was blood pressure monitored hourly, and in only 14 percent was fetal heart beat measured hourly.

Table 3: Indicators of good management of eclampsia –pre-eclampsia cases in hospitals and health centers

Indicator	
<b>Use of drugs in managing severe pre-eclampsia</b>	
Antihypertensive administered	74.4%
Sedative or anticonvulsive administered	51.9%
Antihypertensive and sedative or anticonvulsive administered	68.0%
No drugs administered	32.0%
Number of records with severe pre-eclampsia sampled (n)	133
<b>Use of drugs in managing eclampsia cases</b>	
Antihypertensive administered	90.6%
Sedative or anti-convulsive administered	84.4%
Antihypertensive and sedative or anti-convulsive	96.2%
No drugs administered	3.8%
Number of records with eclampsia sampled (n)	32
<b>Monitoring of eclampsia and severe pre-eclampsia cases</b>	
Blood pressure checked hourly	22.3%
Fetal heart beat checked hourly	14.2%
Both blood pressure and fetal heart beat checked hourly	14.4%
Neither blood pressure nor fetal heart beat checked hourly	81.8%
Number of records with severe pre-eclampsia or eclampsia sampled (n)	<b>165</b>

*N.B data includes data from hospitals and health centers.*

An attempt was made to determine the timing of the caesarian section in relation to the action line in the partograph, but it was not successful because almost all hospitals do not use partograph, except the national referral hospital. In case of obstructed labor Caesarian section should be done within an hour after the action line is passed. However, due to lack of use partograph it was not possible to determine the proportion of obstructed labor where this was fulfilled.

Among the 347 hospital record cards with obstructed labor reviewed, Caesarian section was performed in 190 (54.7 percent) of the cases. However, due to the absence of partograph, it was not possible to determine in how many of the remaining 157 (45.2 percent) of the cases, a caesarean section should have been performed. No other information was also gathered that might have indicated the severity of the condition of the mother or the fetus to indicate need of caesarian section.

Table 4 reveals that there were 24 (7 percent) stillbirths, out of which one third were among those

with C/S and the remaining two third among those with no C/S. There were 47 (13.5 percent) where the baby was live birth but not in good condition (Apgar score 6 or less). About one third of these were from patients delivering by with C/S and the remaining two third from those with no C/S, in 175 (50 percent) of the cases the baby was well, from which 54 percent were from those with C/S and the remaining 46 percent from those with no C/S. In 99 (29 percent) of the cases the condition of the baby was not recorded in the card, 70 percent of which were from those with C/S, while the remaining 30 percent from those with no C/S.

Table 4: Outcome of obstructed labor cases in Hospitals when Caesarian Section (C/S) was and was not performed

Whether caesarean section was performed in hospitals.	All cases	Still-birth	Live birth, but not well (Apgar score 6 or less)	Live birth breathing well (Apgar score 7-10)	Condition of baby Not Recorded
C/S performed	54.7%	33.3%	31.9%	54.3%	70.0%
C/S not performed	45.5%	66.7%	68.1%	45.7%	30.0%
Number of records sampled (n)	347	24	47	175	99

*N.B data only for hospitals*

**Competence and skills maintenance:** The assessment of knowledge of maternity staff (midwives and nurses) of warning signs and symptoms of pregnancy, delivery and puerperium, revealed that many of the warning signs were not mentioned by majority of health providers as warning signs that would prompt them to refer. Although additional and more thorough investigation may be required in this area, the findings suggest poor knowledge of health providers, in all types of health facilities.

As a measure of skills maintenance of maternity/midwifery staff, the maternity staff were asked whether they were provided with training in midwifery skills and if so when was the last time the training provided as well as when was the last time they attended a delivery.

Tables 5 presents the findings on when last time nurse/midwife received training in midwifery skills by facility type. The table reveals that only 10 percent of the midwifery staff had received training in midwifery skills in the 6 months prior to the study and only a cumulative of 19 percent in the past year, while a cumulative of 45 percent in the past five years. More than half of the maternity staff either never (27 percent) received training in midwifery skills (other than their pre-service training) or they received it 5 or

	Type of health facility						
	National referral hospital	Zonal referral hospital	Community hospital	Health center	Health station	Total	Cumulative %
In the past week	0.0%	0.0%	4.2%	0.0%	2.2%	1.2%	1.2%
In the past month	11.1%	0.0%	0.0%	1.4%	0.0%	1.2%	2.4%
In the past 6 months	11.1%	11.8%	4.2%	5.4%	8.7%	7.1%	9.5%
In the past year	11.1%	11.8%	12.5%	8.1%	8.7%	9.4%	18.9%
In the past 5 years	44.4%	17.6%	29.2%	25.7%	21.7%	25.3%	44.8%
5 years ago or longer	22.2%	35.3%	25%	23	28.3%	25.9%	70.7%
Never	0.0%	23.5%	16.7%	36.5%	23.9%	27.1%	97.8%
Number of midwives/nurses sampled (n)	9	17	24	74	46	170	---

Last delivery	Type of health facility						
	National referral hospital	Zonal referral hospital	Community hospital	Health center	Health station	Total	Cumulative %
In the past week	77.8%	70.6%	54.2%	51.4%	15.2%	45.3%	45.3%
In the past month	0.0%	11.8%	33.3%	32.4%	21.7%	25.9%	71.2%
In the past 6 months	0.0%	5.9%	8.3%	13.5%	43.5%	19.4%	90.6%
6 months ago or longer	22.2%	5.9%	0.0%	2.7%	8.7%	5.3%	95.9%
Never	0.0%	0.0%	4.2%	0.0%	10.9%	3.5%	99.4%
Number of nurses/midwives sampled (n)	9	17	24	74	46	170	-

Table 6 presents last time attended delivery by the health personnel. The majority of the maternity staff (71 percent) had attended delivery in the month prior to the study, while 5 percent attended only 6 months or longer before the survey and 3.5 percent had never attended a delivery.

### Discussion

Historically it was not that that women were less likely to develop obstetric complications, or more likely to survive complications in the absence of medical care, that led to low levels of maternal mortality in high-income countries. Rather, it was the fact that women

had access to treatment for complications 7,8.

Mother Baby package states that most interventions related to care of the mother and newborn are within the capacity of a person with midwifery skills. Mother Baby package further states that upgrading the skills of midwives to enable them to respond to obstetric emergencies can reduce maternal mortality. However, additional support is needed from doctors and obstetricians for the management of certain complications and the provision of surgical interventions. Special skills training in essential obstetric care should be available for those categories of health care providers". Given such importance, the number of maternity staff provided with recent training (45 percent within five years) is grossly inadequate.

The main role of the health sector in reducing maternal mortality is to ensure the availability of good-quality essential services to all women during pregnancy and childbirth. With a minimum of good care most women will complete their pregnancies uneventfully; without it, many women suffer avoidable complications, which are sometimes life threatening and often have long-lasting consequences. There is a growing understanding that while certain pregnancy complications can be prevented, a large proportion that occur particularly around the time of birth can be neither prevented nor predicted 3,7,8.

However, not only the health sector have to provide and advocate for attendance of delivery by trained health workers, it also needs to ensure that the health professionals are really skilled with adequate competence and performance to provide quality maternal care. As revealed from the card review of normal and complicated deliveries in health facilities, the performance of the health workers studied was grossly deficient as measured against the national standards described in the national safe motherhood protocol. For instance, vaginal exam was performed every 4 hourly in only 43 percent of normal deliveries, fetal heart beat was monitored hourly in only 16 percent of normal deliveries. The card review of complicated delivery in health facilities also revealed that Blood Pressure was monitored hourly in only 22 percent of pre eclamptic and eclamptic patients.

Only the national referral hospital was using partograph to monitor labor, which is the only reliable way to timely detect and monitor obstructed labor. Hence, both detection and monitoring of obstructed labor is deficient in all other health facilities

There were 24 (7 percent) stillbirths among mothers who were managed for obstructed labor in hospitals, out of which one third were among those to whom a caesarian section (C/S) was performed and the remaining two thirds among those with no C/S. These data suggest that, the chance of stillbirth and baby not in good condition decreases by at least half (from two thirds to one third) when caesarian section was performed as compared to when it was not. However, the findings need to be interpreted with caution because as the main purpose of the data collected was to assess the overall quality of management of obstructed labor rather than to compare the outcome of

caesarian section, some of the precautions that should have been taken to control confounding factors were not taken. The two conditions, namely the timing of the caesarian section and the condition of the mother could definitely affect the outcome independently, but no information was available to measure their effect or to control them. However, in the Eritrean setting one can safely assume it is likely the mothers with more severe complication or condition that might end up with caesarian section. Hence, the effect of the caesarian section in terms of saving fetal life or condition might have been more, if the severity of the condition of the mother was controlled.

It was interesting to see that the condition of the baby is less likely to be recorded when C/S is performed than when it was not. But, it was also not possible to determine whether those with baby's condition not recorded were random or selective. It is possible those who ended up in bad outcome might have been more likely not to be recorded.

As conclusive remarks are difficult to make from the findings, we think that the issue of obstructed labor and caesarian section needs further investigation using more robust study design and more specific study objectives.

More than half of maternity staff either never received training in midwifery or life saving skills or received it more than five years prior to this study. The knowledge of maternity staff on danger signs that would prompt them to refer is generally poor among maternity staff in health facilities that are expected to refer many obstetric complications (staff in health stations and health centers).

The skills acquired during training should be practiced and retained. When the skilled birth attendant delivers 100-200 births a year (8-16 babies a month), he or she is likely to retain the skills needed to provide basic essential obstetric care. But when the attendant delivers fewer than 3 births a month, then specific skills requiring more practice, such as manual procedures for placental removal or breech presentation, may be lost over time 7,8. The skill level of the attendant needed at the most peripheral setting also depends on the readily accessibility and acceptance of referral care.

A health worker with midwifery skills present at childbirth, supported by transport in case emergency referral is required, is perhaps the most critical intervention for making motherhood safer 3,8,9. However, besides adequate competence, to be highly effective, the skilled attendant needs to have an enabling environment that includes drugs, medical supplies, and a referral system with doctors providing emergency obstetric care 3,7,10,11.

## Conclusion

Although the importance of attendance of delivery by skilled birth attendants is now recommended as perhaps the most important strategy to reduce maternal mortality, it is imperative to ensure that the skilled birth attendants are really skilled and perform up to their competence. As the data from this study clearly indicate, in order to reduce maternal mortality

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in developing countries like Eritrea, it is not adequate to just increase the percentage of women who are attended by health professionals, it is also at least equally important to improve the competence and performance of the available birth attendants.

Among other things, training in life saving and other midwifery skills should be provided to midwives and nurses to improve the competence and performance of birth attendants and to improve the quality of care provided to mothers delivering in health facilities and for early detection and management and/or referral when and if obstetric complications develop.

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