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Active Management of the Third Stage of Labour: Knowledge and Challenges of Obstetric Caregivers in Selected Health Facilities in Fako Division, Cameroon

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Abstract

Background: In Cameroon, the decrease in MMR (Maternal Mortality Ratio) from PPH (Postpartum Haemorrhage) despite the reported use of the Active Management of the Third Stage of Labour (AMTSL) is slower than what is required to achieve the Third Sustainable Development Goal (SDG3) hence the need to question obstetric caregivers' competence in AMTSL, as well as the factors hindering its proper use. We therefore aimed to assess obstetric caregivers' knowledge about AMTSL, as well as the determinants and barriers of AMTSL in selected hospitals in Fako Division, Cameroon. **Methods:** This was a hospital-based cross-sectional study of 150 participants recruited in 27 health facilities in Buea, Limbe and Tiko health districts from January 15, 2020, to March 31, 2020. Participants' socio-demographic and qualification characteristics, knowledge and challenges, and the references guiding their practice of AMTSL were collected using a structured questionnaire. AMTSL knowledge was categorized as poor or good and the determinants of good AMTSL knowledge were evaluated. The data was analyzed in SPSS version 25.0. **Results:** Of the 150 caregivers interviewed, only 48.7% had good knowledge of AMTSL. In logistic models, participants' use of AMTSL increased Good knowledge of AMTSL (AOR: 12.96, CI: 1.12 - 150.3, $p = 0.04$). Unavailability of drugs and/or equipment, insufficient staff coverage and lack of knowledge and training of the staff were the major challenges reported. **Conclusion:** Obstetric caregivers in Fako division have knowledge gaps and face numerous challenges in AMTSL use, which could account for the consistently high MMR from PPH. Filling this knowledge gap and mitigating the challenges of these caregivers would certainly accelerate progress towards the achievement of SDG3.

Keywords

Active Management of the Third Stage of Labour, Postpartum Haemorrhage, Obstetric Caregivers, Knowledge, Challenges, Determinants

1. Background

Despite the great role played by the Active Management of the Third Stage of Labour (AMTSL) over the years to reduce the burden of Postpartum Haemorrhage (PPH) and Maternal Mortality Ratio (MMR) [1], the MMRs in many low and middle-income countries are still quite high, for example, in Nigeria (814 per 100,000 live births), Tanzania (398 per 100,000 live births), Ethiopia (353 per 100,000 live births), Ghana (319 per 100,000 live births) in 2015 [2] and Cameroon (467 per 100,000 live births) in 2018 [3]. This high MMR in Cameroon concurs with the consistently high burden of PPH despite the utilization of AMTSL as demonstrated by studies conducted at the Douala General Hospital and the University Teaching Hospital Yaoundé in 2008 and 2013 which reported prevalences of primary PPH of 1.68% and 4.1% respectively [4]. A prevalence of primary PPH of 13.9% was reported at the University Teaching Hospital Yaoundé in 2014 [5] and 23.6% at the Bonassama District Hospital in 2015 [4] [6], which were quite high. Nevertheless, Cameroon has shown great improvement in their MMRs over the years as reported in the Demographic and Health Surveys (DHS); from 784 per 100,000 live births in 2014 [7] to 467 per 100,000 live births in 2018 [8]. However, in spite of this great improvement, these consistently high MMR and prevalences of PPH display slow progress towards achieving the Third Sustainable Development Goal (SDG3).

However, it has been shown that the practice of AMTSL by obstetric caregivers in Cameroon and other low and middle-income countries is not consistent with the recommendations of the International Federation of Obstetrics and Gynaecology (FIGO), especially keeping in mind that a satisfactory level of knowledge and skills, a critical judgment and access to good equipment are mandatory for every birth attendant to perform AMTSL [1]. Moreover, studies conducted in Ethiopia, Nigeria and Ghana highlighted inadequate knowledge, lack of training, communication difficulties between more- and less-experienced caregivers, inadequate staff coverage and other socio-demographic factors as some of the causes of these lapses [8] [9] [10]. This, together with the high MMR and prevalence of PPH in Cameroon despite the reported use of AMTSL, therefore, raised the argument that AMTSL may not be properly done by the obstetric caregivers. We thus hypothesized that the knowledge and practice of AMTSL by caregivers are low while the challenges are numerous in selected hospitals in Fako Division, Cameroon. This highlighted the necessity to study the AMTSL knowledge and practice of obstetric caregivers and their challenges to AMTSL use in selected hospitals in Fako Division, Cameroon.

This study aimed to assess obstetric caregivers' knowledge about AMTSL, as well as the determinants of and challenges to AMTSL use in selected hospitals in Fako Division, Cameroon.

2. Materials and Methods

This was a hospital-based cross-sectional study carried out from January 15, 2020, to March 31, 2020. Obstetric caregivers in selected health facilities in Buea, Tiko and Limbe health districts were enrolled in the study. A Two-stage cluster sampling method was used to select the health districts and health facilities under study. Simple random sampling by balloting was used to select the health districts among Buea, Limbe, Tiko and Muyuka health districts of the Fako division. Tiko, Buea and Limbe health districts were selected. A sampling frame of the health facilities under these health districts was drawn using information from the District Health Offices of the three respective health districts under the study.

Non-probability sampling (Purposive sampling) was done to select the health facilities (in both the private and public sectors) included in the study. The criteria for selection of health facilities were as follows; health facilities with a maternity unit, health facilities with registered information at the District Health Offices and health facilities with obstetric caregivers in greater numbers. A census approach, where all the obstetric caregivers approached in the health facilities under study were assessed and used to effectively meet our sample size (**Table 1**).

The Lorentz formula for estimation of minimum sample size for the study was used with a Confidence interval set at 95% and a five percent level of precision (standard error);

$$n = z^2 p(1-p)/d^2$$

where n = minimum sample size;

z = standard normal variant = 1.96 at a 95% confidence interval;

p = estimated proportion of the competent obstetric caregivers [11];

d = level of precision = 5% or 0.05.

A similar study was carried out in the Dar Es Salaam Municipal Hospitals of Tanzania in 2011 and the proportion of competent midwives on AMTSL was recorded as 10% [11]. Thus our p for this study was 10%.

Thus; the sample size $n = (1.96)^2 \times (0.1)\ (1 - 0.1)/(0.05)^2 = 138.2976$.

Therefore our minimum sample size of 139 obstetric caregivers was required for the study.

Those who gave written consent completed a self-administered semi-structured questionnaire to collect data on their knowledge of AMTSL, the challenges they faced concerning its use, the recommendations they had for better AMTSL practice and the references guiding their practice of AMTSL. The questionnaire was adapted from similar studies carried out in Nigeria (2015, 2018) and Ethiopia

Table 1. Health facilities and recruited participants under the study.

SN	Health facility	Level of hospital care	Health district	Number of caregivers recruited
1.	Limbe Regional Hospital (LRH)	Secondary	Limbe	7
2.	Limbe District Hospital (BOTA)	Primary	Limbe	10
3.	CMA Limbe	Primary	Limbe	11
4.	CMA Batoke	Primary	Limbe	4
5.	CMA Bojongo	Primary	Limbe	8
6.	Larosbi Maternity	Primary	Limbe	2
7.	Family Health Care Foundation	Primary	Limbe	6
8.	Buea Regional Hospital (BRH)	Primary	Buea	15
9.	CMA Muea	Primary	Buea	5
10.	CMA Mile 16	Primary	Buea	7
11.	CMA Buea Town	Primary	Buea	4
12.	CMA Buea Road	Primary	Buea	10
13.	Mount Mary Hospital	Primary	Buea	10
14.	Solidarity Health Foundation	Primary	Buea	11
15.	7th Day Adventist Health Center	Primary	Buea	11
16.	Dr Kahwa Health Center	Primary	Buea	8
17.	Molyko Integrated Health Center (IHC)	Primary	Buea	3
18.	Tiko District Hospital (TDH)	Primary	Tiko	9
19.	CDC Cottage Hospital Tiko	Primary	Tiko	10
20.	Regina Pacis Catholic Missionary Hospital Mutengene	Primary	Tiko	9
21.	CMA Mutengene	Primary	Tiko	10
22.	CMA Tiko Holforth	Primary	Tiko	9
23.	Atlantic Medical Foundation	Primary	Tiko	5
24.	St. Luke Medical Center	Primary	Buea	N/A
25.	Dr Chuwanga Clinic	Primary	Buea	N/A
26.	Dr Soliman Clinic	Primary	Buea	N/A
27.	Tiko Central Clinic (TCC)	Primary	Tiko	N/A

N/A: Excluded from the study, CMA: Centre Medical d'Arrondissement.

(2015, 2018) [9] [10] [11] [12] [13] and the standardized KAP (Knowledge, Attitude and Practice) questionnaire from KAP manual published in 2014 by Food and Agricultural Organization (FAO) [14]. The criteria for scoring obstetric caregivers' knowledge of AMTSL were adapted from a similar study in Ethiopia [10]. The maximum score was 25, and the knowledge was categorized as good or

poor (Table 2).

Data collected was entered in CSPro version 7.3 and analyzed using SPSS version 25. Categorical variables were presented as frequencies and percentages, while continuous variables were expressed as means and standard deviations. Chi-square or Fisher Exact test was used to compare categorical variables where appropriate and Logistic regression was used to identify factors independently associated with knowledge of AMTSL. *P*-values < 0.05 were considered statistically significant.

3. Results

The present study included 150 obstetric caregivers recruited from 27 health facilities in Buea, Limbe and Tiko health districts, of whom, 62 (41.3%) were nurses, 56 (37.3%) midwives, 26 (17.3%) general medical practitioners and 6 (4%) were obstetricians (Figure 1).

Participants' age ranged from 21 to 67 years with a mean age of 34.19 (±9.27) years. Most of the participants, 76 (50.7%) were in the age group 21 to 30 years.

Table 2. Criteria for scoring obstetric caregivers' knowledge on AMTSL [10].

Caregivers' Knowledge	Scoring (N)	Aggregate score (%)
Poor	<20	<80
Good	20 - 25	≥80

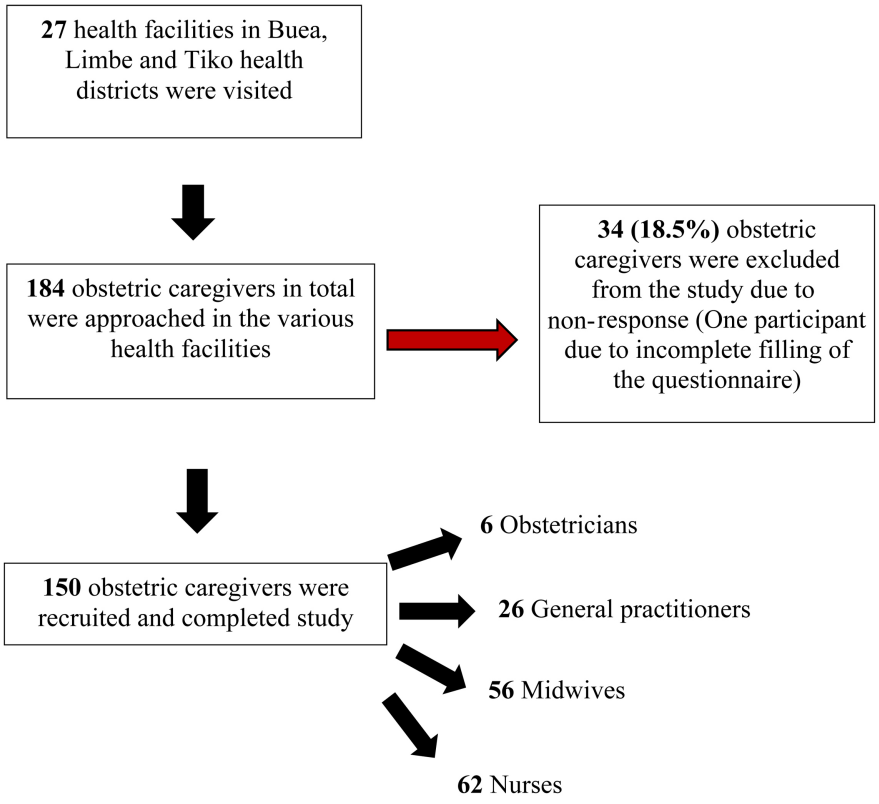

Figure 1. Study consort.

A great majority of the participants were females, 121 (80.7%). The mean work experience was 7.77 (±7.52) years with 50 (33.3%) caregivers having between one to two years of work experience and 43 (28.7%) having more than 10 years of work experience. Furthermore, a majority of the caregivers, 91 (60.7%) worked in unclassified healthcare facilities (Health centres), 46 (30.7%) in Primary healthcare facilities (District hospitals) and 13 (8.6%) in a Secondary healthcare facility (Regional Hospital) (Table 3).

Table 3. Socio-demographic characteristics of the study population (n = 150).

Variables	Frequency	Percentage (%)
Age groups		
21 - 30 years	76	50.7
31 - 40 years	40	26.7
41 - 50 years	25	16.7
>50 years	9	6.0
Mean (±SD) years	34.19 (±9.27)	
Sex		
Female	121	80.7
Male	29	19.3
Marital status		
Married	74	49.3
Single	76	50.7
Profession		
General medical practitioner	26	17.3
Midwife	56	37.3
Nurse	62	41.3
Obstetrician	6	4.0
Work experience (years)		
1 - 2 years	50	33.3
3 - 5 years	32	21.3
6 - 10 years	25	16.7
>10 years	43	28.7
Mean (±SD) years	7.77 (±7.519)	
Workplace		
Health centre (Unclassified)	91	60.7
District hospital (Primary care centre)	46	30.7
Regional hospital (Secondary care centre)	13	8.6

AMTSL: Active Management of the Third Stage of Labour SD: Standard deviation.

Also, the majority of caregivers, 146 (97.3%) knew about AMTSL, 141 (94.0%) reported using AMTSL, and 126 (84.0%) had received training on AMTSL, notably with 73 (58.9%) at the Medical/nursing/midwifery School and 38 (30.6%) at job training workshops (Table 4).

Globally, only 73 (48.7%) caregivers had good knowledge of AMTSL (Figure 2), of whom 22.7% (34/150) were midwives, 12% (18/150) were general medical practitioners, 12% (18/150) were nurses and 2% (3/6) were Obstetricians (Figure 3).

Table 4. Training information of participants on AMTSL.

Variables	Frequency	Percentage (%)
Do you know AMTSL		
No	4	2.7
Yes	146	97.3
Have you ever received training on AMTSL		
No	24	16.0
Yes	126	84.0
If yes where (n = 124)		
At Jobsite training workshop	38	30.6
When observing my colleague performing it	7	5.6
From job aid references	6	4.8
At medical/nursing/midwifery school	73	58.9
Do you use AMTSL		
No	9	6.0
Yes	141	94.0

AMTSL: Active Management of the Third Stage of Labour.

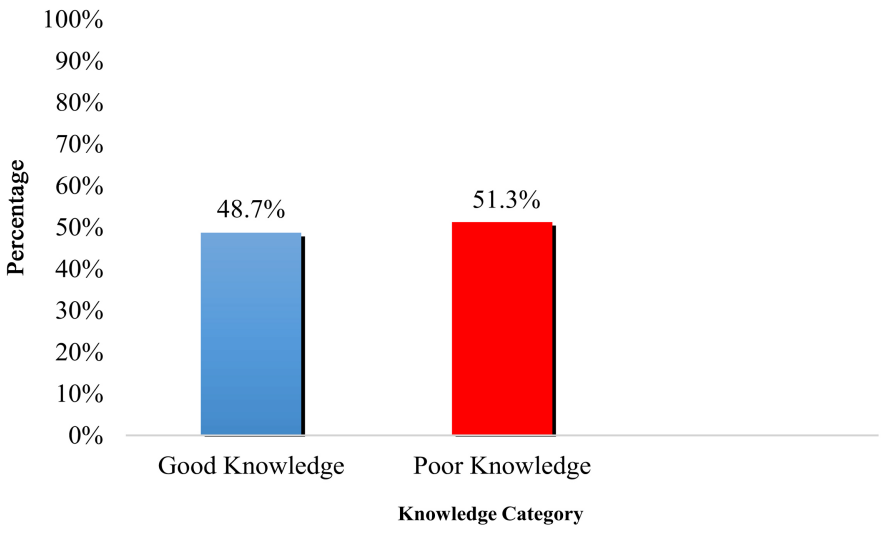

Figure 2. Global or overall knowledge level on AMTSL.

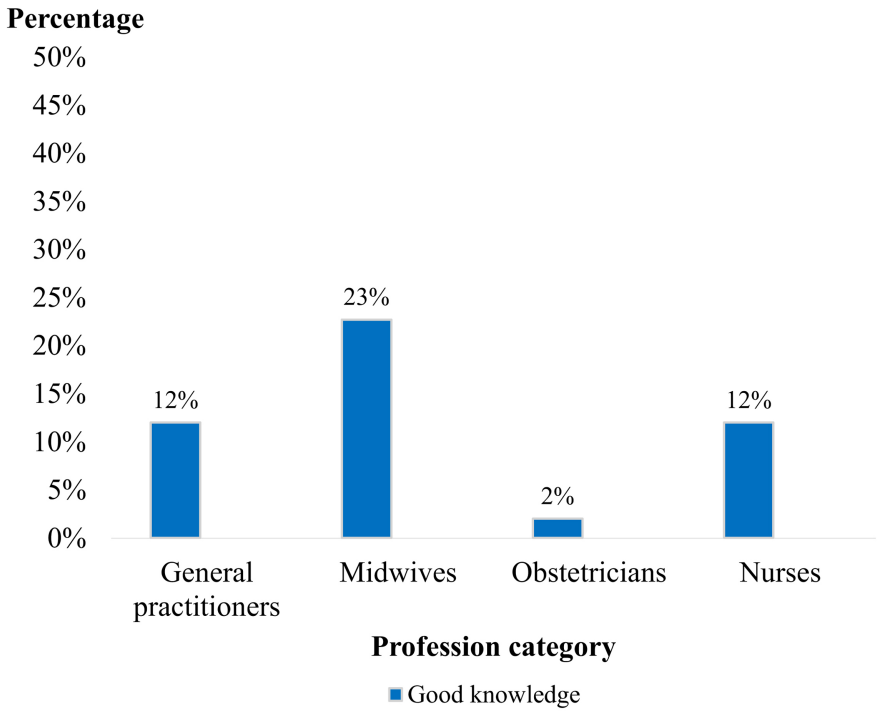

Figure 3. Distribution of good knowledge level on AMTSL per profession.

Only 45.3% of the caregivers knew all the three components of AMTSL (66.7% of obstetricians, 55.4% of midwives, 46.2% of general medical practitioners and 33.9% of nurses). However, up to 94.6% of the caregivers knew of oxytocin as the first line uterotonic drug recommended for AMTSL, 91.1% knew that the recommended dose of the uterotonic of choice for AMTSL was 10 IU (of oxytocin) and 77.9% of them reporting IM route as the recommended route to administer the drug during AMTSL.

Only 45.3% of the caregivers knew all the three components of AMTSL (66.7% of the obstetricians, 33.9% of the nurses, 55.4% of the midwives and 46.2% of the general medical practitioners).

Besides, 72.4% of the caregivers knew that AMTSL was to be completed in 5 to 10 minutes and 64.8% thought that the main goal of AMTSL was to increase the ability of the uterus to contract, facilitate separation of the placenta and to prevent PPH (corresponding to the option "All" on the questionnaire). In addition, 61.6% of the caregivers disagreed with the administration of 10 IU of oxytocin after delivery of the anterior shoulder. Only 31.4% of the caregivers agreed with the administration of 10 IU of oxytocin after delivery of the placenta. As much as 87.8% of the caregivers agreed with the administration of 0.5 mg of ergometrine IM if oxytocin is not available and 64.3% of caregivers agreed with the administration of 600 μg of Misoprostol PO if oxytocin is not available. Clamping and cutting the cord after 1 to 3 minutes following delivery of the baby (Delayed cord clamping) was supported by 79.1% of the caregivers. About two-thirds of the caregivers (67.9%) agreed with waiting for a gush of blood before applying CCT and 72.7% agreed with CCT being done during the contraction. Up to

94.5% of the caregivers agreed with performing UM immediately after delivery and 74.8% agreed with UM being every 15 mins in the first hour, then every 30 mins in the next hour following delivery of the placenta (Table 5).

Following univariate analysis, good knowledge level on AMTSL was significantly associated with profession ($p < 0.001$), whether they had ever received training on AMTSL ($p = 0.037$) and whether they used AMTSL or not ($p = 0.034$). No statistically significant association was found between caregivers' years of work experience and a good knowledge of AMTSL.

In multivariate analysis, caregivers who reported using AMTSL were 13 times more likely to have good knowledge of AMTSL compared to those who reported not using it (AOR: 12.96, 95% CI: 1.12 - 150.3, $p = 0.04$). The profession and training on AMTSL were confounders (Table 6).

Insufficient staff coverage, 31 (22.8%), unavailability of drugs and/or equipment, 23 (19.9%) and lack of knowledge and training of the staff, 17 (12.5%) were the major challenges reported. Furthermore, the challenges varied significantly between caregivers ($p = 0.013$) (Table 7).

Organization of training programs, seminars and workshops on AMTSL following the standard and updated guidelines was the major recommendation proposed by caregivers, 61 (45.9%). Provision of an adequate supply of oxytocin and other delivery equipment, 21 (15.8%) as well as improvement in staff coverage, 21 (15.8%) were both greatly recommended too (Table 8).

The use of Standard Operating Procedures (SOPs), charts and/or posters on AMTSL, 76 (69.7%) pasted on the walls in the maternity ward was the main reference guiding the caregivers' practice of AMTSL. Only six per cent of caregivers reported using WHO or evidence-based practice guidelines to guard their practice of AMTSL. That notwithstanding up to 12 (11%) of respondents did not have any reference guide of their practice of AMTSL (Table 9).

4. Discussion

4.1. Knowledge of Caregivers on AMTSL

In our study, we observed an overall good knowledge level on AMTSL in 48.7% of caregivers. This was very high compared to 7.0% and 10% of caregivers reported in separate studies in Tanzania and 37.7% reported in Ethiopia [10] [11] [13]. Our finding was, however, lower than the 51.5% reported in Ethiopia and 57.8% and 66.7% reported in studies carried out in Nigeria [9] [10] [15]. In that line, midwives were the most knowledgeable group with 22.7% of them with good knowledge of AMTSL. They were followed by general medical practitioners (12%), nurses (12%) and lastly obstetricians (2%). Despite having comparable MMRs to, and better MMRs than some of the countries in the studies aforementioned, this low knowledge level of caregivers on AMTSL is worrisome indicating that AMTSL practice may not be adequate. A possible explanation could be the lack of workshops on AMTSL and/or inadequate pre-service and/or in-service training on AMTSL. Also, the studies carried out in Nigeria, Ethiopia

Table 5. Knowledge of caregivers on AMTSL (MCQs and Likert scale) (n = 150).

Variable	General medical practitioner n (%)	Midwife n (%)	Nurse n (%)	Obstetrician n (%)	Total n (%)
The first line uterotonic recommended for AMTSL is (n = 149)					
Others	1 (4.0)	2 (3.6)	5 (8.1)	0 (0.0)	8 (5.4)
Oxytocin**	24 (96.0)	54 (96.4)	57 (91.9)	6 (100.0)	141 (94.6)
The recommended dose of that drug during AMTSL is (n = 146)					
Others	5 (19.2)	2 (3.6)	5 (8.6)	1 (16.7)	13 (8.9)
10 IU**	21 (80.8)	54 (96.4)	53 (91.4)	5 (83.3)	133 (91.1)
The recommended route to give that drug during AMTSL is (n = 149)					
Others	4 (15.4)	12 (21.4)	15 (24.6)	2 (33.3)	33 (22.1)
Intramuscular**	22 (84.6)	44 (78.6)	46 (75.4)	4 (66.7)	116 (77.9)
Three main components of AMTSL (n = 150)					
Not aware	14 (53.8)	25 (44.6)	41 (66.1)	2 (33.3)	82 (54.7)
Aware**	12 (46.2)	31 (55.4)	21 (33.9)	4 (66.7)	68 (45.3)
Within how long should AMTSL be completed (n = 134)					
Others (<5 mins and >10 mins)	3 (13.0)	17 (30.8)	15 (28.9)	2 (50.0)	37 (27.6)
5 to 10 minutes**	20 (87.0)	38 (69.1)	37 (71.2)	2 (50.0)	97 (72.4)
The main goal of AMTSL is to (n = 145)					
Increase uterine contractility	0 (0.0)	2 (3.7)	1 (1.6)	0 (0.0)	3 (2.1)
Facilitate placental separation	1 (4.2)	3 (5.6)	6 (9.8)	1 (16.7)	11 (7.6)
Prevent PPH	4 (16.7)	14 (25.9)	16 (26.2)	3 (50.0)	37 (25.5)
All**	19 (79.2)	35 (64.8)	38 (62.3)	2 (33.3)	94 (64.8)
Administer 10 units of IM oxytocin after delivery of the anterior shoulder (n = 143)					
Disagree	20 (76.9)	27 (50.9)	37 (63.8)	4 (66.7)	88 (61.6)
Agree**	6 (23.1)	26 (49.1)	21 (36.2)	2 (33.3)	55 (38.5)
Administer 10 units of IM oxytocin immediately after delivery of the placenta (n = 140)					
Agree	9 (36.0)	13 (24.5)	21 (37.5)	1 (16.7)	44 (31.4)
Disagree**	16 (64.0)	40 (75.5)	35 (62.5)	5 (83.3)	96 (68.6)
If oxytocin is not available, administer 0.5 mg of Ergometrine IM (n = 131)					
Agree	19 (82.6)	50 (92.6)	42 (87.5)	4 (66.7)	115 (87.8)
Disagree**	4 (17.4)	4 (7.4)	6 (12.5)	2 (33.3)	16 (12.2)
If oxytocin is not available, administer 600 micrograms of Misoprostol (PO) (n = 123)					
Disagree	12 (54.6)	14 (28.0)	15 (32.6)	3 (60.0)	44 (35.8)
Agree**	10 (45.4)	36 (72.0)	31 (67.4)	2 (40.0)	79 (64.2)
Clamp and cut the cord after 1-3 minutes following delivery of the baby (n = 139)					
Disagree	7 (28.0)	9 (16.4)	12 (22.2)	1 (20.0)	29 (20.9)

Continued

Agree**	18 (72.0)	46 (83.6)	42 (77.8)	4 (80.0)	104 (79.1)
Wait for a strong uterine contraction (2-3 minutes) before delivering the placenta (n = 143)					
Disagree	2 (7.7)	17 (32.0)	9 (15.5)	1 (16.7)	29 (20.2)
Agree**	24 (92.3)	36 (68.0)	49 (84.5)	5 (83.3)	114 (79.8)
Wait for a gush of blood before applying controlled cord traction CCT (n = 140)					
Disagree**	6 (25.0)	14 (26.0)	22 (39.3)	3 (50.0)	45 (32.3)
Agree	18 (75.0)	40 (74.0)	34 (60.7)	3 (50.0)	95 (67.9)
Controlled cord traction (CCT) is done during the contraction (n = 139)					
Disagree	6 (24.0)	16 (19.7)	16 (29.6)	0 (0.0)	38 (27.3)
Agree**	19 (76.0)	38 (70.3)	38 (70.4)	6 (100.0)	101 (72.7)
Uterine massage is done immediately after delivery of the placenta (n = 145)					
Disagree	2 (8.0)	1 (1.8)	5 (8.5)	0 (0.0)	8 (5.5)
Agree**	23 (92.0)	54 (98.2)	54 (91.5)	6 (100.0)	137 (94.5)
Uterine massage is done every 15 mins in the first hour, then every 30 mins in the next hour following delivery of the placenta (n = 139)					
Disagree	6 (26.0)	18 (33.3)	10 (17.2)	1 (25.0)	35 (25.2)
Agree**	15 (74.0)	36 (66.7)	48 (82.8)	3 (75.0)	104 (74.8)

**: Correct response; AMTSL: Active Management of the Third Stage of Labour; PPH: Postpartum Haemorrhage.

Table 6. Determinants of good knowledge of AMTSL (n = 150).

Variables	Knowledge on AMTSL n (%)			Univariate analysis	Multivariate analysis	
	Poor	Good	Total	*p*-value	AOR (95% CI)	*p*-value
Profession (n = 150)						
General medical practitioner	8 (10.4)	18 (24.7)	26 (17.3)	**<0.001**	0.28 (0.04 - 1.85)	0.187
Midwife	22 (28.6)	34 (46.6)	56 (37.3)		0.65 (0.12 - 3.50)	0.611
Nurse	44 (57.1)	18 (24.7)	62 (41.3)		2.17 (0.39 - 12.03)	0.374
Obstetrician	3 (3.9)	3 (4.1)	6 (4.1)		1	
Have you ever received training on AMTSL (n = 150)						
Yes	60 (77.9)	66 (90.4)	126 (84.0)	**0.037**	1.05 (0.34 - 3.26)	0.932
No	17 (22.1)	7 (9.6)	24 (16.0)		1	
Do you use AMTSL (n = 150)						
Yes	69 (89.6)	72 (98.6)	141 (94.0)	**0.034**	12.96 (1.12 - 150.30)	**0.040**
No	8 (10.4)	1 (1.4)	9 (6.0)		1	

AMTSL: Active Management of the Third Stage of Labour, AOR: Adjusted Odds ratio; CI: Confidence interval.

Table 7. Challenges of caregivers to AMTSL practice (n = 136).

Variables	General medical practitioner n (%)	Midwife n (%)	Nurse n (%)	Obstetrician n (%)	Total n (%)	*p*-value
Challenges on the implementation of AMTSL (n = 136)						
Unavailability of drugs/equipment	5 (21.7)	11 (20.8)	5 (9.3)	2 (33.3)	23 (16.9)	**0.013**
Mother's refusal to cooperate	0 (0.0)	5 (9.4)	6 (11.1)	0 (0.0)	11 (8.1)	
Placenta accreta/retention	0 (0.0)	9 (17.0)	8 (14.8)	0 (0.0)	17 (12.5)	
Insufficient staff coverage	7 (30.4)	9 (17.0)	15 (27.8)	0 (0.0)	31 (22.8)	
Complications such as bleeding	1 (4.3)	1 (1.9)	5 (9.3)	0 (0.0)	7 (5.1)	
Lack of knowledge and training of staff	6 (26.2)	2 (3.8)	6 (11.1)	3 (50.0)	17 (12.5)	
No challenge	4 (17.4)	16 (30.2)	9 (16.7)	1 (16.7)	30 (22.1)	

Bold, statistically significant, AMTSL, Active Management of the Third Stage of Labour. *p*-values from Chi-square and fisher exact test.

Table 8. Recommendations to improve AMTSL practice (n = 133).

Variable	General medical practitioner n (%)	Midwife n (%)	Nurse n (%)	Obstetrician n (%)	Total n (%)
Suggestions for reinforcement of AMTSL (n = 133)					
Perform abdominal massage and controlled cord traction	1 (4.0)	1 (2.0)	1 (1.9)	0 (0.0)	3 (2.3)
Proper health education and adequate assessment of women before delivery	0 (0.0)	4 (8.2)	5 (9.4)	0 (0.0)	9 (6.8)
Trainings//Workshops and seminars/Update of information	17 (68.0)	22 (44.9)	17 (32.1)	5 (83.3)	61 (45.9)
Adequate supply of oxytocin and other delivery equipment	4 (16.0)	8 (16.3)	9 (17.0)	0 (0.0)	21 (15.8)
Improve staff coverage	2 (8.0)	6 (12.3)	13 (24.5)	0 (0.0)	21 (15.8)
None	1 (4.0)	8 (16.3)	8 (15.1)	1 (16.7)	18 (13.4)

AMTSL, Active Management of the Third Stage of Labour.

and Tanzania [9] [10] [11] [13] [15] principally assessed midwives and nurses, meanwhile our study assessed physicians, midwives and nurses. Besides, physicians in the studied health facilities are usually called up to manage complicated third stages of labour and hence take less part in uncomplicated deliveries [16].

Table 9. Reference guide of AMTSL practice (n = 109).

Variable	General medical practitioner n (%)	Midwife n (%)	Nurse n (%)	Obstetrician n (%)	Total n (%)
Reference at workplace on how to perform AMTSL (n = 109)					
Use of partograph	1 (4.3)	7 (16.3)	2 (5.3)	0 (0.0)	10 (9.2)
Presence of charts, SOPs and posters in the maternity	18 (78.4)	28 (65.1)	25 (65.7)	5 (100.0)	76 (69.7)
WHO/Evidence based practice	3 (13.0)	1 (2.3)	2 (5.3)	0 (0.0)	6 (5.5)
From experienced staff	0 (0.0)	0 (0.0)	2 (5.3)	0 (0.0)	2 (1.8)
Capacity building programs and hospital meetings	0 (0.0)	3 (7.0)	0 (0.0)	0 (0.0)	3 (2.8)
None	1 (4.3)	4 (9.3)	7 (18.4)	0 (0.0)	12 (11.0)

AMTSL, Active Management of the Third Stage of Labour, SOPs, Standard Operating Procedures.

When assessing the caregivers' knowledge of the components of AMTSL, we observed that less than half of the caregivers (45.3%) knew all the three main components of AMTSL. Our finding was higher than that reported in South Africa (36.0%) [17] but was however very low compared to findings in Tanzania (70.1%), Ethiopia (63.2% and 58.0%) and Lesotho (62.2%) [10] [11] [16] [18]. The majority of respondents were able to state at most 2 of the components correctly. A possible explanation could lie in the difference in the questionnaire used in our respective studies. Ours had open-ended questions while theirs had multiple choice questions for one to select the right answer. This reduced the chance of guess work.

The Guideline Development Group (GDG) of WHO considered the use of uterotonics as the main intervention within AMTSL, and, in our study, administration of uterotonics was the most frequently reported AMTSL component by the caregivers. This shows that despite not knowing all the components of AMTSL, many knew the most important component.

4.2. Determinants of Knowledge of Caregivers on AMTSL

The fact that caregivers' use of AMTSL was the only factor independently associated with good knowledge of AMTSL in our study contrasted with a similar study carried out in Ethiopia [16] where the profession of the caregivers was the only independently associated factor to a good knowledge of AMTSL. Caregivers who reported using AMTSL were more likely to have good knowledge on it as compared to those who reported not using it. This can be explained by the saying practice makes perfect, as their regular use of AMTSL has urged them to know all about it to ensure adequate practice and thus has improved their knowledge on the subject.

4.3. Challenges to AMTSL Utilization

Insufficient staff coverage (22.8%) was the major challenge to the use of AMTSL faced by caregivers. This challenge was also reported by caregivers interviewed in similar studies carried out in Ghana and Tanzania [8] [11]. Unavailability of drugs and equipment, as well as lack of knowledge and training on AMTSL, were also major challenges reported in Tanzania, Ghana and Nigeria [8] [11] [15].

The recommendations for better practice of AMTSL proposed by the caregivers under study were in line with the challenges they reported; with the organization of training programs, seminars and workshops on AMTSL following the standard and updated guidelines, provision of an adequate supply of oxytocin and other delivery equipment as well as improvement of staff coverage being the major recommendations they proposed.

Our study also revealed that 11% of caregivers did not have any reference guiding their practice of AMTSL. Moreover, only six per cent of the caregivers reported using guidelines from international bodies like WHO or evidence-based practice to guide their practice of AMTSL. The Majority of them used standard operating procedures (SOPs), charts and/or posters on AMTSL (69.7%) pasted on the walls in the maternity ward as the main reference guiding their practice of AMTSL confirming the hypotheses that most caregivers rely more on standard operating procedures (SOPs) (usually pasted on the walls of maternity units) rather than actual (updated) guidelines or directives on AMTSL [19]. Therefore, there was no scientific backing of their practice [20].

4.4. Strengths and Limitations

A qualitative arm of this study could enlighten us more on the challenges faced by caregivers on the practice of AMTSL.

Our study included physicians (obstetricians and general medical practitioners), which only a few studies in sub-Saharan Africa have done.

Finally, our study was the first to assess obstetric caregivers' knowledge on AMTSL, the challenges they face in its use and the determinants of good knowledge on AMTSL in Cameroon.

5. Conclusions

There is a knowledge gap in AMTSL among obstetric caregivers in Buea, Limbe and Tiko health districts with less than half having good knowledge.

Caregivers' use of AMTSL was the only determinant of good knowledge of AMTSL identified in these health districts.

Challenges reported by the caregivers in the practice of AMTSL included the lack of training and workshops, insufficient staff coverage and the unavailability of drugs and/or equipment.

These challenges could account for the high MMR from PPH in Cameroon despite AMTSL use as well as the slow progress towards achieving SDG3.

Ethical Approval and Consent to Participate

Approvals for this study were obtained from the Institutional Review Board (IRB) of the Faculty of Health Sciences of the University of Buea (FHS-UB), [Ref. No. 2020/1057-01/UB/SG/IRB/FHS]; the Regional Delegation of Public Health for the South West Region [Ref. No. R11/MINSANTE/SWR/RDPH/PS/496/786], the District Medical Officers (DMOs) of Buea [Ref. No. FVol2/L/MINSANTE/RDPH SW/DHS Buea/159], Limbe [Ref. No. 413B/SWR/RDPH/DMOL/33] and Tiko Health Districts, [Ref. No. 2020/28II/MINSANTE/RDPHSW/THD-65] and the Directors of the selected health facilities.

All eligible participants were informed on the aim and objectives of the study and possible adverse effects (time-consuming to fill questionnaires) after which the information sheet was given to each of them. Participants were given opportunities to ask questions for clarity. Participants who accepted to be part of the study gave written consent. No material or financial incentives were given to encourage participation in the study. Confidentiality was ensured by coding and keeping the data collected very securely through the use of passwords only accessible to the principal investigator. No information on identification such as names was obtained from the participants, rather codes were used to make sure it could not be traced back to them.

Availability of Data and Materials

The authors declare that data sufficient to produce the presented results will be made available on reasonable request to the Department of Obstetrics and Gynaecology, Faculty of Health Sciences, University of Buea. Data requests can be submitted through the corresponding author.

Authors' Contributions

Tih William Ntchompbopughu: Conception of the topic, designed the protocol, carried out data collection, drafted the manuscript.

Egbe Obinchemti Thomas: Conception of the topic, Supervised, interpreted the results, revised and edited the manuscript.

Tendongfor Nicholas: Data analysis, review and editing of the manuscript.

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Conflicts of Interest

The authors declare having no conflict of interest.

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Appendix: Data Collection Form (English Version)

Active Management of the Third Stage of Labour (AMTSL) Competency Assessment Questionnaire

TITLE: Active Management of the Third Stage of Labour (AMTSL): Knowledge and Challenges of Obstetric caregivers in selected health facilities in Fako division, Cameroon.

Participants: Obstetricians, General practitioners, Midwives and Nurses in the maternity ward.

Section One: Socio-demographic data.

Instructions: Please fill the blank spaces and encircle/tick the single most correct answer in each multiple-choice question.

Participant Code …….. (For Investigator use only)

1) Age……..

2) Sex…….. F/M

3) Marital status

(a) Single

(b) Married

(c) Divorced

4) Profession

(a) Obstetrician

(b) General medical practitioner

(c) Midwife

(d) Nurse

5) For how long have you been practising? …… (Years of experience)

6) Where do you work?

(a) Health centre

(b) District Hospital

(c) Regional Hospital

(d) Reference Hospital

Training information on AMTSL.

7) Do you know AMTSL?

(a) Yes

(b) No

If yes continue to question (8) below, if no please give reasons ……

8) Have you ever received any training on AMTSL?

(a) Yes

(b) No

If no, continue to question (9) below, if Yes then where?

(a) At medicine/midwifery/nursing school

(b) At job training workshop

(c) When observing my colleagues performing it on a woman

(d) From job aid references

(e) Other (Please specify)……

9) Do you use AMTSL?

(a) Yes

(b) No.

If no, please give reasons……..

Section Two: Knowledge of AMTSL

Instructions: Please circle the single most correct answer in each multiple-choice question.

1) Postpartum haemorrhage (PPH) is blood loss of about

(a) 1000 ml

(b) 800 ml

(c) 500 ml

(d) 400 ml

(e) 1000 ml and 500 ml

2) How do you routinely measure postpartum blood loss?

(a) Estimated blood loss

(b) Blood indices (Haemoglobin, Haematocrit)

(c) Other (please specify)……..

(d) Estimate blood loss and Blood indices

3) How do you recognize PPH?

(a) Estimated blood loss

(b) Symptoms and signs of cardiovascular compromise

(c) All

(d) Others (Please specify)……..

4) Causes of immediate postpartum haemorrhage

(a) Uterine atony

(b) Retained placenta and/or membranes

(c) Traumatic delivery

(d) Bleeding disorders

(f) All

(g) Others (Please specify)……..

5) The first line uterotonic recommended for AMTSL is

(a) Ergometrine

(b) Oxytocin

(c) Misoprostol

(d) Other (Please specify)……

6) The recommended dose of that drug (selected in Question 5 above) during AMTSL is

(a) 5 IU

(b) 10 IU

(c) 2.5. IU

(d) Other (Please specify)……

7) The recommended route to give that drug (selected in Question 5 above) during AMTSL is

(a) Oral

(b) Intramuscular (IM)
(c) Intravenous (IV)
(d) Other (Please specify)……
8) What are the three main components of AMTSL?
a)……..
b)……..
c)……..
9) Within how long should AMTSL be completed?
(a) 1 minute, if relaxed within 3 minutes
(b) 5 minutes
(c) 5 - 10 minutes
(d) Other (Please specify)……
10) The main goal of AMSTL is to:
(a) Increase the ability of the uterus to contract
(b) Facilitate separation of the placenta
(c) Prevent PPH
(d) All
(e) Other (Please specify)……..

Section Three: Practice of AMTSL

Instructions: place a tick in the box corresponding to the option of your choice.

	Procedure: Active Management of the Third Stage of Delivery	Strongly Agree (S/A)	Agree (A)	Strongly Disagree (S/D)	Disagrees (D)	No Decision (N/D)
1.	After delivering the first baby, palpate the abdomen and rule out the presence of another fetus before continuing?					
2.	Administer 10 units of IM oxytocin after delivery of the anterior shoulder					
3.	Administer 10 units of IM oxytocin immediately after delivery of the placenta					
4.	If oxytocin is not available, administer 0.5 mg of Ergometrine IM					
5.	If oxytocin is not available, administer 600 µg of Misoprostol per os (PO)					
6.	Clamp and cut the cord after 1 - 3 minutes following delivery of the baby					

Continued

7.	Clamp and cut the cord in less than 1 minute if the baby is asphyxiated
8.	Wait for a strong uterine contraction (2 - 3 minutes) before delivering the placenta
9.	Wait for a gush of blood before applying controlled cord traction (CCT)
10.	Controlled cord traction (CCT) is done during the contraction
11.	The placenta is supported with both hands following its delivery
12.	Extraction of the placental membranes is done gently with lateral (clockwise) movements
13.	Uterine massage is done immediately after delivery of the placenta
14.	Examine the placenta for completeness following its delivery
15.	Uterine massage is done every 15 mins in the first hour, then every 30 mins in the next hour following delivery of the placenta

Section Four: Challenges faced in the implementation of AMTSL.

Instructions: Fill the spaces provided below

1) What challenges do you face in the implementation of AMTSL in your setting?

……
……...……

2) What would you like to suggest to improve AMTSL implementation?

……
……

3) List at least one reference at your workplace that guides how to perform AMTSL

.....
.....