

Facility-Based Delivery Service Utilisation Among Women of Childbearing Age in Nguti Health District, Cameroon: Prevalence and Predictors

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Abstract

Background: Maternal morbidity and mortality related to childbirth has remained a great challenge globally. One important strategy put in place to reduce maternal mortality related to childbirth is to increase number of women who deliver in a health facility. This study's objectives were to determine the proportion of women who deliver in a health facility, assess factors influencing facility-based delivery service utilisation and determine the relationship between facility-based delivery service utilisation and participant's socio-demographic characteristics in the Nguti Health District (NHD).

Methods: A community based cross-sectional study was carried-out among women who delivered at least once in NHD. Multistage sampling technique was used to select participants and data collected using a structured interviewer administered questionnaire. Data collected was analysed using Epi Info version 3.5.4.

Results: A total of 329 women took part in the study. The proportion of women who delivered in health facilities was 68.7%. Most women (59.0%) acknowledged having a health facility in their community with 145 (44.5%) women saying it takes more than 120 minutes to trek to the nearest health facility from their homes. The median monthly income of participants was 20,000FCFA (IQR: 15,000-40,000) and there was a statistical significant association with income and delivering in health facility.

Conclusion: Proportion of women using health facilities during delivery was above average, factors influencing health facility utilization during delivery include low average monthly income, traditional values associated with burying of placenta held by women, distance of health facilities from women's home, sudden onset of labour and availability of TBA's in communities. There was a statistically significant association between having high monthly income and delivering in health facility. Women need education on advantages of delivering in health facilities. Further studies need to be conducted for much longer durations and involving larger samples of women to determine other factors associated with health facility utilisation for deliveries.

Keywords: Delivery; Health facility; Women of child bearing age; Prevalence; Predictors; Cameroon

Abbreviations: ANC: Antenatal Care; Aor: Adjusted Odds Ratio; CI: Confidence Interval; DEFF: Design Effect; DMO: District Medical Officer; HF: Health Facility; IRB: Institutional Review Board; IQR: Inter Quartile Range; Mdgs: Millennium Development Goals; N: Frequency; No: Number; OR: Unadjusted Odds Ratio; Ref: Reference Variable Category; SD: Standard Deviation; S/N: Serial Number; Tbas: Traditional Birth Attendants; WHO: World Health Organisation; NHD: Nguti Health District

Background

The process of child birth (delivery) is not without complications. Some of the complications of delivery include foetal distress, breech presentation, placenta previa, nuchal cord and cephalopelvic disproportion [1]. While most pregnancies and births are uneventful, all pregnancies are at risk. In fact, about 15% of all pregnant women develop a potentially life-threatening complication that calls for skilled care and some will require a major obstetrical intervention to survive [2]. If a delivery complication is not or poorly attended to, it results in maternal and or child mortality and morbidity [2].

Pregnancy and childbirth related morbidity and mortality are serious problems worldwide especially in the less developed world [3]. Globally about 287000 maternal deaths occurred in 2010 and the less developed countries accounted for 99% of the global maternal death [4,5]. It has been documented that the life time risk of maternal mortality related to pregnancy and childbirth in the developed countries is 1 in

8000 compared to 1 in 76 in less developed countries [6]. In Cameroon, the maternal death ratio is approximately 670 deaths per 100,000 live births [7]. All these have led to the creation of many declarations on issues related to pregnancy and delivery such as the Millennium Development Goals (MDGs) in 2000. One of these MDGs (MDG 5) had as main goal to improve maternal health by three-quarters within 1990-2015 [7]. However, till now, MDG5 is yet to be achieved by many countries in the less developed world [7]. A WHO report estimated that Cameroon should reach the target of 168 maternal deaths per 100,000 live births by 2015 [8]. With the current maternal mortality rate of 670 deaths per 100,000 births, Cameroon is far from reaching this target.

Also, studies have shown that health facility-based delivery service utilisation is an important intervention that reduces maternal morbidity and mortality from delivery or child birth related issues

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[3,9,10]. Actually, maternal mortality reduces by 52 % worldwide when women deliver in health facilities [9]. Similarly, facility delivery service utilisation reduces morbidity and mortality related to pregnancy and childbirth by 13-33% and neonatal mortality by 20-30 % worldwide [10]. Facility-based delivery further ensures proper management of child birth complications and or timely referral of delivering women to higher levels where child birth complications can be better managed [3].

Despite this, facility-based deliveries are still very low in most countries especially in the less developed world [4,11]. Studies have shown that globally, about 60 million deliveries take place every year outside the health facility [12-14]. In some less developed countries, about 80% of women still do not deliver in a health facility [14].

Since health facility-based delivery service utilisation is an important intervention that reduces maternal morbidity and mortality from child birth related issues [3,9,10], we assessed the proportion of Facility-based deliveries among women, the factors (socio-economic, health facility and cultural) that influence health Facility-based delivery among women of childbearing age and investigated the relationship between facility-based delivery service utilisation and participant's socio-demographic characteristics in the Nguti Health District.

Methods

Study design and setting

The study was a community based cross-sectional study conducted among women who had delivered at least once in Nguti Health District (NHD).

The NHD is one of the eighteen health districts found in the South West Region of Cameroon. It has an estimated population of 21,125 inhabitants, 5,206 of whom are women of childbearing age and 1074 of whom are expectant pregnant women. The district consists of eight health areas namely; Ayong, Bakogo, Elumba Mbo, Eyany, Manyemen, Nguti I, Nguti II and Ntale. These health areas are found in three main subdivisions-Eyumjock, Upper- Bayang and Nguti and the district has ten health facilities.

Study population, participants and sampling

The study population was made up of women of child bearing age in the NHD. To be eligible for the study, a participant had to be of aged 21 or above, must have delivered at least once in NHD, a resident of the NHD and or must have been living permanently in the district for the past six months. Participants who had hearing problems, who were severely sick, suffering from mental health problems and who refused to give consent to participate were excluded from the study.

The sample size was calculated using the formula for estimating a single population proportion for an infinite population [15]. We took the prevalence of facility delivery to be 15.7% as identified in a study in Ethiopia [16]. We then used a margin of error of 5%, a 95% level of confidence and a design effect (DEFF) of 1.5 to calculate the required sample size of 305. We calculated a non-response rate of 10% and added to this sample size and had an overall sample size of 336. Despite this, we still had cases of non-response and ended up collecting data from 329 participants.

A multistage sampling method was used to select participants. In the first stage, all the 8 health areas of the district were included. Then we took the total population of each health area and divided by 5 (average number of persons per household in Cameroon [17]), to get the number of households in each health area. We further calculated

the number of households to be visited in each health area by dividing the total number of households in each health area by the total number of households of the district multiplied by the calculated sample size of 336 (Table 1). In the second stage, a list of all communities in each health area was got and balloting done to select three communities from each health area-giving a total of twenty-four communities for all eight health areas of the district from which data was collected. Finally, in the third stage at community level, we located a centre in the community, spun a bottle and visited all households to the left of the head of the bottle. We interviewed only one woman from each open household provided she met the inclusion criteria. This procedure continued until the required sample was reached for each health area.

Data collection and management

Data was collected by trained data collectors using a structured interviewer administered questionnaire adopted from studies done in Ethiopia and Tanzania [18,19]. The adopted questionnaire was first pretested in one community of the NHD which was not one of the study communities and then modified before being used to collect data. The questionnaire was divided into four sections as follows: Section A; socio-demographic characteristics (age, marital status, education level and parity), Section B; socio-economic characteristic such as occupation and income level, Sections C and D comprised of cultural and health facility factors respectively. To control data quality, researchers supervised daily collection of data. The data collected on the printed questionnaire was checked daily for completeness and entered into an electronic questionnaire created in an EPI Info database for onward analysis. The electronic data was saved in a folder in the computer with a password known only to the researchers and hard copies of the questionnaires were securely kept in a cupboard accessible only to the researchers.

Data analysis

Data was analysed using the statistical software program EPI Info version 3.5.4. The socio-demographic characteristics were described using frequencies and percentages for categorical variables and means, standard deviation or range and inter-quartile ranges for continuous variables.

To determine the proportion of facility-based deliveries among women and the factors (socio-economic, health facility and cultural) that influence health facility-based delivery among women, we grouped items in the questionnaire under health facility delivery, socio-economic, and cultural factors and computed the frequencies and percentages of each item.

S/N	Health Areas	*Total Population	No of Households	No. of Households to be sample
1	Ayong	1811	362	29
2	Bakogo	3652	730	58
3	Elumbo Mbo	2544	509	40
4	Eyang	4575	915	73
5	Manyemen	3415	683	54
6	Nguti 1	1260	252	20
7	Nguti 2	1183	237	19
8	Ntale	2685	537	43
	Total	21,125	4,225	336

*Health area population figures obtained from the Regional Delegation of Public Health for the South West Region, Buea-Cameroon; S/N-Serial Number, No-Number.

Table 1: Number of households sampled in each health area of the Nguti Health District.

To assess the relationship between facility-based delivery service utilisation and participant's socio-demographic characteristics, bivariate and multivariate analysis was done. The bivariate analysis comprised of using delivery in health facility as a binary outcome variable and women's socio-demographic characteristics as predictors. Unadjusted odds ratios, 95% confidence intervals and P-values were computed and all variables having P-values ≤ 0.25 in the bivariate analysis were considered as appearing to have an association with delivering in health facility and were included in the multivariate logistic model [20]. The multivariate analysis considered delivering in health facility as a binary outcome variable and all the variables with P-values ≤ 0.25 in the bivariate analysis as predictors. Adjusted odds ratios, 95% confidence intervals and p-values were computed. Variables with p-values < 0.05 were considered to have a statistically significant association with delivering in a health facility.

Ethical considerations

Ethical approval to conduct the study was obtained from the IRB of the Faculty of Health Sciences of the University of Buea and administrative authorization was obtained from the Dean of the Faculty of Health Sciences of the University of Buea, the Regional Delegate of Public Health for the South West Region and the District Medical Officer (DMO) of the Nguti health district. All participants provided written informed consent and apart from the inconvenience of taking time to answer the questionnaire, participants were not exposed to any undue risk. All information collected from participants was used only for the purpose of this study.

Results

Demographic characteristics

Table 2 shows the socio-demographic characteristics of the 329 study participants who were included in this study. The mean age of participants was 30 years (SD: 6.25) and a greater proportion of the participants (73.86%) were married. The median age of participants at first delivery was 19 years (IQR: 18-21). One hundred and ninety (57.9%) of the participants had earned only the primary level of education and most of their husbands (62.1%) equally had only primary education. Majority of the participants (97.9%) were Christians most of whom (38.0%) were from the Banyan tribe. As concerns decision making in the house, most participants (73.3%) said their husbands were the ones in charged. The median number of children participants had was 3 (IQR: 2-5) while the median number of people living in participants homes was 6 (IQR: 4-7).

Proportion of health facility-based delivery service utilisation

Out of the 329 women sampled, 103 (31.3%) delivered their last child out of the health facility while 226 (68.7%) delivered their last child in a health facility (Figure 1). In those who delivered out of the health facility, 68 (66.0%) delivered at home, 32 (31.0%) delivered in a Traditional Birth Attendant's (TBA) home while the remaining 3 (3.0%) delivered in the house of a retired nurse.

Factors influencing women's utilisation of health facilities

Table 3 shows the socio-economic, health facility and cultural factors influencing health facility-based delivery service utilisation. One hundred and fifty women had housewife as occupation with 20,000FCFA (IQR: 15,000-40,000) being their median monthly income. Majority of the women's husbands (82.6%) were peasant farmers. More than half of the women (59.0%) admitted that they had health facilities in their areas with most of them (53.1%) saying that they have at least one health facility in their area. However, 145 (44.5%) of participants

Characteristics	N or Mean or Median	% or SD or IQR
Age (years)	30	6.25
Age (years) at 1 st Delivery	19	18-21
Marital status		
Single	68	20.67
Married	243	73.86
Divorced	6	1.82
Separated	2	0.61
Widowed	10	3.04
level of education of husband		
No formal Education	11	4.4
Primary education	154	62.1
Secondary education	76	30.6
University	7	2.8
Religion		
Christian	319	97.9
Muslim	2	0.6
Others'	5	1.5
Husbands religion		
Christian	238	96.7
Others	8	3.3
Tribe of origin		
Bakossi	33	10.0
Banyan	125	38.0
Bassossi	69	21.0
Mbo	84	25.5
Others**	18	5.5
Person who takes decision		
The woman herself	48	14.6
The husband	241	73.3
Others***	40	12.2
Number of children	3	2-5
Household size	6	4-7

N=frequency, %=frequency in percent, SD=Standard deviation and IQR=Inter quartile range, No formal education = participants cannot read and write, Primary education involves at most seven years of school, secondary-at most twelve of school, high school- at most fourteen years and university above fourteen years of education. Other*= Traditionalist, Others**= participants not from any of the four tribes in the Nguti Health District, Other***= Family Members.

Table 2: Socio-demographic characteristics of study participants.

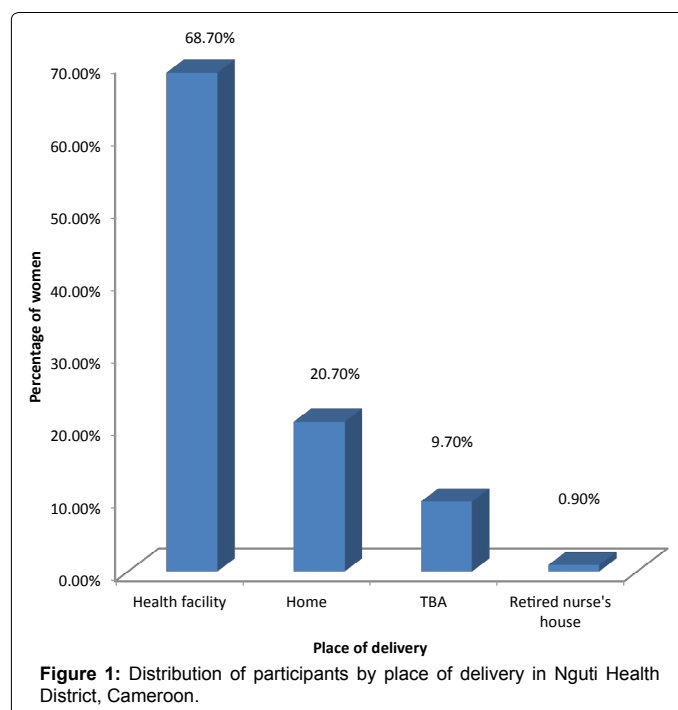


Figure 1: Distribution of participants by place of delivery in Nguti Health District, Cameroon.

Characteristics	N or Mean or Median	(%) or SD or IQR
Average monthly income	20,000	15,000-40,000
Occupation		
Housewife	150	47.2
Farmer	95	29.9
Self employed	55	17.3
Government	2	0.6
Others	16	5.0
Husband's occupation		
Farmer	205	82.6
Self employed	33	13.4
Government	10	4.0
Availability of health facility in the community		
Yes	193	59.0
No	134	41.0
Time to reach nearest Health Facility		
Less than 30 Minutes	66	20.2
Between 31 and 60 minutes	61	18.7
Between 61 and 120 minutes	54	16.6
Greater than 120 minutes	145	44.5
Satisfaction with health services		
No	14	4.8
Yes	280	95.2
Attendance of ANC		
No	24	7.3
Yes	304	92.7
Number of ANC visits	3	1.47
Education on maternal health		
No	26	8.4
Yes	284	91.6
Belief and practice		
Herbs must be taken orally or as an enema to enhance delivery	24	7.3
Placenta needs to be handled in a special way (like burying it under a plantain)	36	10.9
Neutral	269	81.8
Preferred place for next deliver		
Participant's own home	9	2.7
TBA's home	2	0.6
Health facility	317	96.6

N=frequency, %=frequency in percent, ANC=Antenatal Care, SD=Standard Deviation, IQR=Inter quartile range

Table 3: Factors influencing women's utilisation of health facilities during delivery (N=%) Or Mean(SD) or Median(IQR).

acknowledged that it takes more than 120 minutes to trek from their houses to the nearest health facility. Despite this, 203 (62.1%) of the participants said most women in their community deliver at the health facilities. Also, 145 (44.6%) women had their last deliveries within the past 2-5 years and 99.2 % of them said they were happy with health services offered them during delivery. Three hundred and four (92.7%) of participants attended ANC services during their last pregnancy while 24 (7.3%) did not. Nonetheless, 317 (96.6%) of the participants preferred that when next they are pregnant, their next place of birth will be a health facility. Considering reasons for non use of health facilities during delivery, 60 (18.2%) women upheld traditional beliefs associated to child bearing at home such as burying placenta after birth

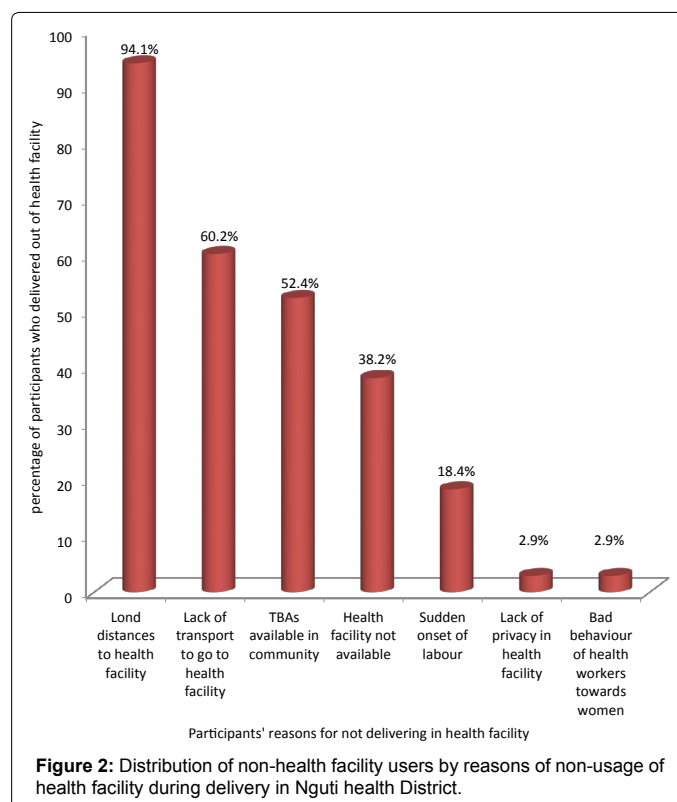
themselves at home rather than giving birth in a health facility where they don't have access to the placenta.

For participants who actually delivered their last child out of a health facility, most of them (94.1%, 60.2% and 52.4%) said long distances of health facilities from their homes, lack of transport to go to health facility during labour and availability of TBAs to deliver them in community respectively were their reasons for avoidance of health facilities (Figure 2).

Predictors of health facility-based delivery service utilisation

The socio-demographic correlates of women's utilisation of health facility are presented in Tables 4 and 5. In the bivariate analysis, the factors that appeared to have an association with health facility utilisation during delivery included having education more than primary level when compared to having primary or less level education, having religion as Muslim or others when compared to being a Christian, having delivered more than two children when compared to two or lesser deliveries, being self-employed or working with government or another person when compared to being just a housewife and having greater than 20,000FCFA monthly income when compared to having less than or equal to 20,000FCFA monthly income.

In fact, the odds ratio of delivering in a health facility in women who had greater than primary level of education was 2.41 times (95% CI: 1.40- 4.14) that in participants who had less than primary level of education. Also, the odds ratio of delivering in health facility in women who were Muslim or others in religion was 0.33 times (95% CI: 0.07- 1.51) that in women who were Christians. The odds ratio of delivering in a health facility in women who had delivered more than twice was 0.72 times (95% CI: 0.43-1.20) that in women who had delivered twice or less. Again, the odds ratio of delivering in a health facility in women who were self-employed was 1.57 times (95% CI: 0.77-3.19) than in women who were just house wives. Lastly, the odds ratio of delivering



Socio-demographic characteristics	N	%	OR*	95%CI	P-value
Age					
21-30	131	68.6	Ref		
31-40	85	70.8	1.11	0.68-1.53	0.68
>40	10	55.6	0.57	0.22-1.52	0.26
Marital Status					
Single	47	69.1	Ref		
Married	172	68.0	0.95	0.53-1.69	0.17
Divorced/Separated	7	87.5	3.13	0.35-27.05	0.30
Education Level					
≤Primary	136	62.7	Ref		
>primary	89	80.2	2.41	1.40-14	0.001
Religion					
Christians	221	69.3			
Muslim/Others*	3	42.9	0.33	0.07-1.51	0.14
Tribe					
Bakossi	25	75.8	Ref		
Banyan	95	76.0	1.01	0.41-2.48	
Bassossi	44	63.8	0.56	0.22-1.44	2.98
Mbo	45	53.8	0.37	0.15-0.91	0.03
Others**	17	53.6	5.44	0.62-47.55	0.13
Parity					
≤2	80	73.4	Ref		
>2	146	66.4	0.72	0.43-1.20	0.20
Age at 1 st Delivery					
≤ 21	183		Ref		
>21	43	69.4	1.04	0.57-1.90	0.90
Household Size					
≤5	110	70.5	Ref		
>5	114	66.7	0.84	0.52-1.34	0.45
Decision maker					
Self	31	64.6	Ref		
Husband	165	68.5	1.19	0.62-2.28	0.60
Others**	30	75.0	1.65	0.65-4.16	0.29
Occupation					
Housewife	101	67.3	Ref		
Farmers	61	64.2	0.87	0.51-1.49	0.61
Self employed	42	76.4	1.57	0.77-3.19	0.21
Gov't	16	88.3	3.88	0.86-17.55	0.08
Household income					
≤20,000FCFA	95	60.5	Ref		
>20,000FCFA	117	76.5	2.12	1.30-3.47	0.003

OR*=Unadjusted odds ratio, Ref= reference variable category, CI=confidence interval, P-value<0.25 suggests possible association to facility-Based delivery Service utilisation, other*=Traditionalist, =other**= participants not from any of the four tribes in the Nguti Health District, Other***Family members.

Table 4: Predictors of Health Facility Based-Delivery Service Utilisation.

in a health facility in women who have a monthly income of more than 20,000FCFA was 2.12 times (95% CI: 1.30-3.47) that in women who had 20,000FCFA or less monthly income (Table 4).

However, after controlling for potential confounding factors in each of the socio-demographic characteristics, only having monthly income of more than 20,000FCFA had a statistically significant association to delivering in a health facility. Actually, the odds ratio

of delivering in health facility in women with monthly income greater than 20000FCFA was 1.78 times (95% CI: 1.03-3.08) that in women with monthly income of less than or equal to 20,000FCFA (Table 5).

Discussion

Health facility-based delivery service utilisation is an important intervention that reduces maternal morbidity and mortality due to child birth related issues [1,8]. Non-Facility-Based delivery service utilisation is related to high maternal mortality [21].

In this study, to appraise the level of utilisation of health facilities by women during delivery, we assessed the proportion of women who delivered their last child in a health facility, factors that influenced delivery in a health facility and the relationship between women's socio-demographic characteristics and the utilisation of health facility services during delivery. We document that the proportion of women who deliver in a health facility is above average (68.7%). However, factors such as few or no availability of health facilities, long distances between health facilities and women's homes, availability of TBA's or people who can deliver women at home, sudden onset of labour, no transport to go to a health facility when in labour, bad behaviours of health workers and the lack of privacy in a health facility are also documented as factors influencing maternal deliveries out of a health facility. In this study, participants' socio-demographic characteristics did not accurately distinguish women who deliver in health facility and those who did not.

While women's level of utilisation of health facilities during delivery in this study is above average (68.7%), it contradicts what other studies elsewhere have stated that facility-based delivery service utilisation is still very low in most under developed countries [11,22,23]. Ironically,

Socio-demographic characteristics	N	%	aOR*	95%CI	P-Value
Parity					
≤2	80	73.4	Ref		
>2	146	66.4	0.94	0.51-1.74	0.85
Occupation					
Housewife	101	67.3	Ref		
Farmer	61	64.2	1.12	0.61-2.05	
Self Employed	42	76.4	1.46	0.65-3.25	0.36
Government	16	88.9	0.79	0.14-4.50	0.79
Education Level					
≤ Primary	136	62.7	Ref		
> primary	89	80.2	1.78	1.00-3.64	0.05
Religion					
Christian	221	69.3	Ref		
Muslim/Others*	3	42.9	0.35	0.07-1.80	0.21
Tribe					
Bakossi	25	75.8	Ref		
Banyan	95	76.0	0.91	0.34-2.43	0.85
Bassossi	44	63.8	0.57	0.29-1.60	0.29
Mbo	45	53.6	0.37	0.29-1.60	0.05
Others**	17	94.4	4.17	0.44-39.44	0.21
income					
≤ 20,000CFA	95	60.5	Ref		
>20,000CFA	117	76.5	1.91	1.03-3.08	0.04

aOR*= adjusted odds ratio, CI=Confidence interval, P-value <0.05 are statistically significant, Ref=reference variable category, Others*= Traditionalist, Others**=Participant not from any of the four tribes in the Nguti Health District.

Table 5: Association between Socio-Demographic characteristics and choice of place of delivery (Multivariate analysis).

this high facility utilization rate does not explain or affect the still very high maternal mortality of over 800 per 100,000 pregnant women in Cameroon. We found no studies done in Cameroon on health facility delivery service utilisation before this one but a high level (95.9%) of non-health facility utilisation during delivery has been reported in a study done in Ethiopia [3]. Also, the factors influencing health facility delivery service utilisation in this study though varying in proportions are similar to factors influencing health facility-based deliveries as reported in studies conducted elsewhere [3,5]. In fact, some of the factors documented in this study as influencing maternal deliveries out of health facility (few or no availability of health facilities, long distances between health facilities and women's homes, sudden onset of labour, no transport to go to a health facility when in labour, bad behaviours of health workers) have also been reported in other studies elsewhere [4,9,10].

The level of health facility delivery utilisation reported in this study could be influenced by participants not reporting right information on where they seek delivery services. Though we sampled participants in the Nguti Health District, the sample may also not have been representative of the population of women delivering in the Nguti Health District. We do not however, expect the difference in health facility utilization to be significant as our study was a community based study. Potential errors in data collection could also mean that our level of health facility utilisation in the Nguti Health District is overestimated and that our results are misleading. Nonetheless, the quality of our data was assured by using trained data collectors and monitoring of the data collection by the investigators.

We are not aware of any studies done in Cameroon that have assessed the level of health facility utilisation during childbirth and the associated socio-demographic factors to health facility utilisation. Most studies in this area were done only to estimate the proportion of women not using health facilities during delivery without assessing the association of women's socio-demographic characteristics with health facility utilisation [3,13,14].

While our sample size was adequate for determining factors influencing health facility utilisation, only a few covariates appeared to have an association with health facility delivery utilisation. After controlling for confounding by adding the covariates to the logistic regression model, only one variable (having monthly income greater than 20,000FCFA) had a statistical significant association to health facility delivery utilisation. Our not finding an association with many of the socio-demographic variables is dissimilar with the study that found associations between health facility utilisation and some socio-demographic characteristics-level of education, high cost of health facility services, distance from health facility, living in rural areas [4].

Considering that participants highlighted sudden labour, poor behaviours of health workers and availability of TBA's or people to deliver them at home as some of the reasons for not using health facilities during delivery, this shows a lack of knowledge on the importance of seeking quality delivery services on the part of the women. As such, there is a need for education of women on the importance of health facility utilisation during delivery and also a need for health workers to improve their interaction and behaviour with women during delivery.

Conclusion

The proportion of women using health facilities during delivery is just above average and the factors that influence health facility utilization during delivery include low average monthly income, traditional values of burying placenta upheld by some women, long

distances of health facilities from women's homes, sudden onset of labour and the availability of TBA's in communities. There was only a statistically significant association between having monthly income greater than 20,000FCFA and health facility delivery service utilisation. Other studies need to be conducted for much longer durations and involving larger samples of women to determine other factors associated to health facility utilization.

Conflicts of Interests

The authors declare no conflict of interest.

Authors' Contributions

CSA, BAW, NPF, JA conceived, designed and revised the article, CSA designed the study protocol and collected data; BAW and JA analysed data and assisted with data interpretation; CSA, KKI, SNA, NPF and JA assisted with study design. All authors wrote and or reviewed the manuscript.

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