

Determinants Of Home Delivery Among Childbearing Mothers in Anseba Region, Eritrea: A Facility Based Unmatched Case Control Study

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Abstract

Background

Maternal mortality is the leading problem of public health throughout the world. Most of the maternal mortality occurred in developing countries like Sub-Saharan Africa and it is associated with home deliveries. This study aimed to identify factors that initiated mother to deliver at home in Anseba region.

Methods

Facility based unmatched case control study was carried out among mothers delivered six months prior starting data collection in Anseba Region. The sample size was allocated to each HFs using probability proportional to size then systematic random sampling was used to select respondents at each health facility. Purposive sampling was used for the Focus Group Discussion (FGD) which was held in three subzones. Quantitative data was analyzed statistically using SPSS v.22 program whereas the qualitative data was analyzed using thematic frame work method.

Results

A total of 600 mothers (200 cases and 400 controls) participated in the study. Mothers travels > 2hrs (AOR: 12.37, 95%CI: 4.57-33.5), walk on foot (AOR: 3.1, 95%CI: 1.31-7.16), no pursuing or few ANC contacts 8.68(2.42-31.1), medium birth intervals (AOR: 1.93, 95%CI: 1.03-3.63), and poor knowledge of danger signs of pregnancy (AOR: 2.44, 95%CI: 1.16-5.14) were predictors of home delivery.

Conclusion

Even though the government of Eritrea offers free maternity services, long distance, means of transportation, maternal education and occupation and not attending to the ANC clinics were the major predictors of home delivery.

keywords: Determinants, Home Delivery, Maternal Mortality Rate and Skilled Birth Attendance

1. Introduction

1.1. Background

Home delivery is childbirth in non-clinical setting and not attended by skilled birth attendants. It has a significant role in increasing the incidents of maternal mortality due to direct obstetric causes such as hemorrhage, sepsis, eclampsia and pre-eclampsia (pregnancy induced hypertension), uterine rupture, abortion and others. Globally, in 2023 an estimated 260,000 maternal death occurs due to and shows a reduction

of 40% from 2000-2023. Maternal death is equivalent to 712 deaths each day. The highest maternal mortality ratio (MMR) was toll in the Sub-Saharan Africa region (SSA) which accounts 70% [6]. This needs critical attention in the SSA region, because the fertility rates and life time risk of maternal mortality is high with stagnation of poverty and lack of health seeking behaviour on maternal health problem reduction [7,8]. Most of the causes of maternal death are directly attributed to obstetric causes such as hemorrhage,

sepsis, unsafe abortion, obstructed labor, and hypertensive disorders [4]. The number of maternal deaths can be significantly reduced when deliveries are performed by Skilled Birth Attendants (SBAs) in a health facility, enabling the effective management of obstetric complications. The WHO advised every delivery should be take place at health facility by skilled birth attendants. Yet, high proportion of the delivery occur at home without any assistance of skilled birth attendants. Despite the high proportion of women attending Antenatal Care (ANC) in SSA, the number of deliveries performed by skilled attendants remains low, as a large majority of births still take place at home [1-10].

MMR is increasing in the SSA and it is due to the birth takes place at home and practiced in unhygienic environments without skilled health professionals. Several researches argued that home delivery is still widely practiced across SSA. High levels of maternal deaths in developing countries are widely attributed to low maternal health care-seeking behavior, which is evidenced by low rates of Antenatal Care (ANC) utilization and very low skilled birth attendance. Proper Antenatal Care (ANC) and the right choice of delivery location, as recommended by health authorities, can enhance the value of delivery outcomes. Furthermore, the place of delivery is also a key predictor of neonatal death. The World Health Organization (WHO) recommends at least eight antenatal care (ANC) contacts during pregnancy and that postnatal care should be provided at 6 hours, 6 days, 6 weeks, and 6 months after childbirth to ensure women's physical and mental wellbeing [27,28]. Mothers who give birth at home miss the important chance of receiving postnatal care from skilled birth attendants [11- 26].

Eritrea is one of the SSA countries and located in the horn of Africa with high MMR. A national quality assurance sampling (LQAS) reported 83.7% of mothers deliver their child at health facilities, this indicates home deliveries is still existing in the Eritrean. Moreover, findings were reported from a study done in rural communities of Eritrea 75.4% of the mothers deliver their child at home . Institutional delivery is widely disproportionate between rural and urban communities. Which means facility delivery is mostly practiced in urban due to easy access of health facility and transportation than rural communities. Though the facility delivery reaches 83.7% but postnatal care was low in Eritrea only 5% of mothers get care after their delivery by health care professionals. However, Home delivery is mostly associated with distance to health facilities, low or no ANC contact, low maternal education, maternal age, birth order, rural residence, costs of transportation and medication. Most causes of maternal death are preventable through timely and appropriate interventions, as demonstrated in many developed countries. To address the needed maternal services maternal mortality can be significantly reduced by equipping health facilities with skilled delivery attendants and implementing other necessary structural responses. The government of Eritrea is playing a great role in reducing delivery related complication since independence, as a result, the maternal mortality rate is going decreased from 1678

per 100,000 live birth in 2000 to 291 per 100,000 live births in 2023. Though the ANC coverage in Eritrea is sustain high the maternal death is still not met the ambitious SDGs goal-3 of maternal death to less than 70/100,000 per live births and to end preventable deaths of newborns and under-five children by the year 2030. The ANC coverage in Eritrea in 2023 was 99.5%% but only small proportion 38% of the mothers start their ANC contact during first trimester. This indicates the proportion of mothers reaching eight contact during her pregnancy period was negligible. Though The access and utilization of health facility is high the maternal delivery is still low, suggests that there are other factors play a role in the reduction of institutional delivery. The Eritrea MOH have articulated policies and strategies which have a great significance in reducing and prompt managing in child bearing related problems by introducing and strengthening maternity waiting home in area where pregnant mother travels more than an hour to the nearest health facility. e progresses are ensuring due to necessary maternal health services like quality ANC, institutional delivery, family planning, post-natal care and introduction of emergence obstetric services. Community based intervention which is easily managed like maternity waiting home in remote rural community is essential in the reduction of home delivery like in Eritrea [11]. Therefore, this study expected to dig out the main determinant factors of home delivery and its end consequences. In addition, the researchers tried to investigate the cultural or socio-economic backgrounds have contribution or not [27- 41].

2. Methods

2.1. Study Design, Setting and Population

The study used a mixed study design employing unmatched case control health facility based study among childbearing age women combined with quantitative and qualitative approaches (focus group discussions (FGDs)). The study took place in all HFs of Anseba region, Eritrea. The region has 35 Health Facilities (HFs). Maternal and child health services offers in all of the HFs. The study area had an estimated population of 449,203 at the time of study. Among the total population, 20% (89,841) women were at child bring age and 3% (13,477) were estimated at delivery stage, which were the target population of this study. Finally, mothers who brought their children for routine immunization services and deliver within six months' prior the commencement of the study were selected as study populations. The outcome of interest was childbirth mothers either at home (cases) or at health facility (controls).

2.2. Sampling Technique And Sample Size Determination of the Study

Due to a lack of prior data on p1 and p0 required from previous study which is helpful for sample size determination, the research team conduct large size pilot study among 150 participants in three districts in order to determine the actual sample size of this study. Following the assumption were made in calculating the sample size: 95% confidence level and 80% power. General knowledge about obstetric complication was used as the exposure knowledge.

The proportion of cases with good knowledge was 71.8% and 82.5% controls. Sample size was calculated using Open Epi version 3.0.1 with a control to case the ratio of 1:2. After adding 5% non-response, total sample size was 599~600, including 200 for cases and 400 for controls. Simple random sampling was used to select study participants using the master family index as the sampling frame. Anseba region has a total of 35 health facilities. Purposive sampling was used for the Focus Group Discussion (FGD). FGD was held in three subzones and encompassed 24 mothers who deliver at home (cases), eight mothers from each subzone were selected. The participants for the FGD were mothers who gave birth at home (cases).

2.3. Data Collection and Tools

Face to face interview was used to collect the quantitative data. The questionnaire was modified from related literatures and minor changes was made to fit with objectives of the study. Data was collected using a pre-tested questionnaire from mothers who attended to health facilities for routine immunization services. Initially the questionnaire was developed in English and was translated to local language (Tigrigna). Pilot study was carried out for the quantitative questionnaire among 30 mothers seven days prior to the actual study and amendments was done accordingly. Respondents of the pilot study were not included in the actual study. Qualitative data was collected using open ended questionnaire discussion and FGD guidelines. Tape recording and note taking were used as tools of data collection for the qualitative data (FGD) [42].

2.4. Data Processing and Analysis

The quantitative data was analyzed statistically using SPSS v.22 statistical software. Descriptive results were presented in frequencies and proportions. A Chi-square (χ^2) test was used to compare the difference in proportions and $P < 0.05$ was considered as significant. The variables having an association in bivariate considered in to multivariate logistic regression analysis. Thematic frame work analysis was used to analyze the qualitative data. The research team tried to prevent errors by continuously discussing and negotiating the content of key words, broader concepts and units of meanings. Then, we have thoroughly discussed and clarified the content of each tape-recorded interview. Next,

we translated and transcribed verbatim of each interview and the discussions in the focus groups. The questions asked were reflecting in the data and themes. A list of all themes were prepared and the themes were abbreviated as codes, and then written next to the appropriate segments of the transcripts, where after subthemes were developed. Transcription of data was analyzed manually by using thematic framework procedures which involved three main stages; familiarization, coding and interpretation. The analysis summarizes and accounts for analyzing document that all group members commented on. Finally, we arranged a ranking and weighting methods for barriers and enablers according the respondents response. Then the research team notifies the factors according to their frequency.

2.5. Measurement

Knowledge about danger signs during pregnancy were measured by comparing means score responses to eight danger signs. Those with scores below the mean were classified as having “poor knowledge” while those with scores above the mean were categorized as having “good knowledge”. General knowledge of obstetric complications was measured by calculating mean scores to eight obstetric complications, which were then categorized into “good”, “fair” and “bad” levels of knowledge. Respondents with “good knowledge” included that scoring 75% and above; “moderate knowledge” included those with scores between 50 to 74% and; “poor knowledge” characterized those that scored less than 50%

3. Results

3.1. Results of the Quantitative Data

3.1.1. Socio Demographic Characteristics of The Respondents

A total of 600 respondents (200 cases and 400 controls) were participated in the study. The mean age of the cases and controls was 28.8 (SD ± 6.3) and 27.4 (SD ± 5.9) years respectively. Almost all of the respondents were married (567, 94.5%). One hundred fifty-nine (79.5%) of the cases and 287 (71.7%) controls were Muslim religion and Tigre ethnicity. Sixty-six (33%) of the cases and (17.8%) controls were illiterate. Approximately one-thirds of the cases' and one-sixth of the controls' husbands' were illiterate (see Table-1).

Variables	Controls (%)	Cases (%)	P value (χ^2)
Residence of the Respondents			
Rural	290(72.5)	187(93.5)	0.000
Semi-urban	88(22)	8(4)	
Urban	22(5.5)	5(2.5)	
Age of the Respondents			
< 18	8(2)	9(4.5)	0.026
19-25	152(38)	57(28.5)	
26-35	203(50.7)	106(53)	
35+	37(9.3)	28(14)	

Marital status of the Respondents			
Married	373(93.2)	194(97)	0.247
Single	13(3.3)	4(2)	
Separated/widowed	14(3.5)	2(1)	
Religion of the Respondents			
Muslim	287(71.7)	159(79.5)	0.047
Orthodox	54(13.5)	25(12.5)	
Catholic	48(12)	10(5)	
Protestant	11(2.8)	6(3)	
Ethnicity			
Tigre	281(70.3)	162(81)	0.013
Tigrigna	85(21.2)	30(15)	
Blien	34(8.5)	8(4)	
Maternal education			
Illiterate	71(17.8)	66(33)	0.000
Primary	145(36.2)	93(46.5)	
Junior	105(26.3)	33(16.5)	
Secondary & above	79(19.7)	8(4)	
Husbands' education			
Illiterate	61(15.3)	60(30)	0.000
Primary	95(23.7)	58(29)	
Junior	100(25)	41(20.5)	
Secondary	103(25.7)	31(15.5)	
College level	41(10.3)	10(5)	
Family size			
<2	12(3)	4(2)	0.206
3-4	159(39.7)	66(33)	
5-6	124(31)	63(31.5)	
7+	105(26.3)	67(33.5)	

Relatives©;maternal parents, mother and father in-law.

Table 1

3.1.2. Economic and Intermediate Variables Related to Identifying and Reaching HF

Majority (94%) of the cases and 84.7% controls were house wives. Less than one-third of the cases and controls had close birth intervals. One-Fourth (25%) of the cases and 27.5% controls were from poor families. The median time to reach the nearest health facility for the cases and controls was 60-120minutes (IQR $\pm$ 60 minutes) and 21-60minutes

(IQR $\pm$ 60) minutes, respectively. Regarding, the means of transportation, 67% cases and 69% of the controls said that they travel to the HF on foot. About 78.5% of the cases and 87.2% controls had heard information regarding pregnancy and delivery. About 72.5% of the cases and 78.7% controls get the information from health workers, followed by Community Health Agent (HA), radio, TV, meeting and written material like newspaper and books (see table-2).

Variables	Category	Controls No (%)	Cases No (%)	P value(x ² test)
Maternal occupation	Housewife	339(84.7)	188((94)	0.000
	Farmer	21(5.3)	10(5)	
	Skilled employee	34(8.5)	1(0.5)	
	others@	6(1.5)	8(4)	
Husbands occupation	Farmer	212(53)	114(57)	0.002
	Skilled employee	54(13.5)	22(11)	
	Soldiers	78(19.5)	49(24.5)	
	Merchants	56(14)	15(7.5)	
Household wealth index	Poor	110(27.5)	50(25)	0.116
	Medium	194(48.5)	115(57.5)	
	Rich	96(24)	35(17.5)	
Distance to HF	2+	70(17.5)	97(48.5)	0.000
	1-2hrs	127(31.7)	78(39)	
	21-60 minutes	122(30.5)	18(9)	
	<20 minutes	81(20.3)	7(3.5)	
Means of transport	On foot	276(69)	134(67)	0.003
	Traditional transport	76(19)	56(23)	
	Vehicle	48(12)	10(5)	
Information hear	Hear	349 (87.2)	157(78.5)	0.005
	Not hear	51(12.85)	43(21.5)	
Types of information	ANC follow-up	278(69.5)	116(58)	0.023
	Place of delivery	257(64.2)	107(53.5)	
	Child vaccination	142(35.5)	49(24.5)	
	Nutrition	106(26.5)	30(15)	
	Bed net use	56(14)	17(8.5)	
	Exercise	40(10)	13(6.5)	
	Danger signs	93(23.3)	39(19.5)	
	HIV Testing	59(14.7)	17(8.5)	
	Iron folic acid	83(20.8)	39(19.5)	
	Others	40(10)	10(5)	
Source of information	Health workers	315(78.7)	145(72.5)	0.001
	CHA	53(13.2)	38(19)	
	TV	52(13)	4(2)	
	Radio	63(15.7)	23(11.5)	
	Meeting	40(10)	13(6.5)	
	Written materials	23(5.75)	2(1)	

Table 2: Others@: students, Shopkeepers and Women without Job. Traditional Transport*: Mule, Horse and Karieza.

3.1.3. Reproductive and Obstetric Related Characteristics of the Study Respondents

Sixty-seven (33.5%) of the cases and 105 (26.3%) of the controls had a parity of seven and above. Less than one-fourth (23%) of the cases and 13% controls had distant birth intervals. Minority (5%) of the cases and 29.3% controls had five and above antenatal care contacts and about 56.8% of

the cases and 53.6% controls start ANC follow up during the second trimester. More than half (55.5%) of the cases and 63.5% controls decide the place of delivery by themselves. Only sixteen (8%) cases and 22.3% controls had good knowledge of danger signs of pregnancy. Five (2.5%) cases and 14(3.5%) controls have good knowledge of obstetric complication, as shown in table-3.

Variables	Categories	Cases (%)	Controls (%)	P-value (χ^2)
Parity	<2	165(41.3)	67(33.5)	0.255
	3-4	129(32.3)	66(33)	
	5-6	73(18.2)	41(20.5)	
	7+	33(8.2)	26(13)	
Birth intervals	Close	110(27.5)	59(29.5)	0.021
	Medium	198(49.5)	114(57)	
	Distant	92(23)	27(13.5)	
Ever had abortion	No	191(95.5)	362(90.5)	0.162
	Yes	9(4.5)	38(9.5)	
Number of abortion	1 times	7(77.7)	30(80)	0.065
	>2	2(22.3)	8(20)	
Ever had still birth	No	180(90)	334(83.5)	0.289
	Yes	20(10)	66(16.5)	
Number of ANC contact	no contact	10(5)	7(1.8)	0.000
	1x	12(6)	16(4)	
	2-3x	110(55)	126(31.5)	
	4x	57(28.5)	135(33.7)	
	5x and above	11(5.5)	116(29)	
Timing of ANC follow up	<12 weeks (1 st trimester)	30(15.8)	102(26)	0.012
	12-24 weeks (2 nd trimester)	108(56.8)	211(53.6)	
	>24 weeks (3 rd trimester)	52(27.4)	80(20.4)	
Decision maker for place of delivery	Mother	254(63.5)	111(55.5)	0.061
	Mother and husband	40(10)	15(7.5)	
	Husband only	73(18.2)	53(26.5)	
	Relatives©	33(8.3)	21(10.5)	
Knowledge of danger signs of pregnancy	Poor knowledge	311(77.7)	184(92)	0.000
	Good knowledge	89(22.3)	16(8)	
General knowledge of obstetric complication	Poor	330(82.5)	184(92)	0.005
	Moderate	56(14)	11(5.5)	
	Good	14(3.5)	5(2.5)	

Table 3: Relatives©: Maternal Parents, Mother and Father In-Law.

3.1.4. Reason Why Mothers Deliver at Home

The most commonly mentioned reason for mothers (cases) to deliver at home were no transportation services (19.7%), long distance (17.7%), abrupt delivery (14.8%), absence of

child care taker at home after mother (7.7%), not necessary (6%), no waiting home (2.3%) and others as shown in figure-1.

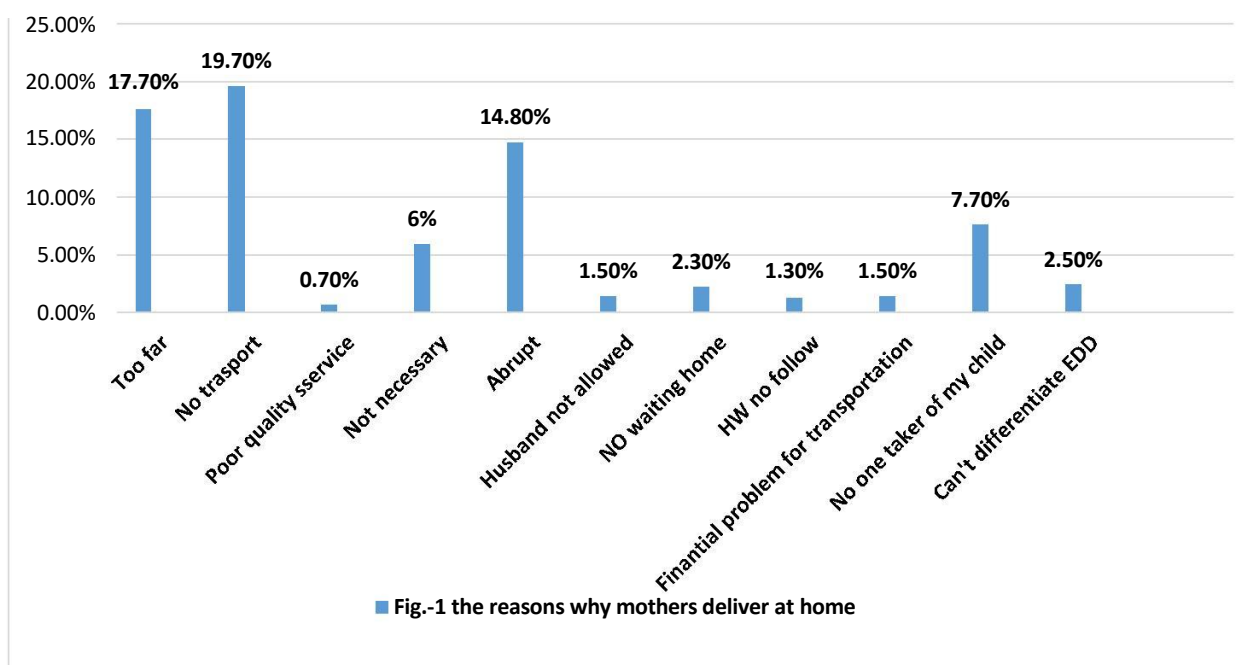


Figure 1: The Reason Why Mothers Deliver at Home

3.1.5. Mothers Knowledge of Danger Signs During Pregnancy

Most commonly mentioned danger signs during pregnancy by cases were vaginal bleeding (35%), severe anemia (22.5%), severe headache (16%), blurred vision (10%), gravidum emesis (10%), swelling of faces and limbs (9.5%),

loss of fetal movements (8.5%), Epi-gastric pain (5.5) and other (5%). Whereas controls cited as vaginal bleeding (47%), severe anemia (34%), severe headache (31%), blurred vision (23.5%), gravidum emesis (19%), loss of fetal movements (17.5%), swelling of face and limbs (17%), and epi-gastric pain (14%), (fig-2).

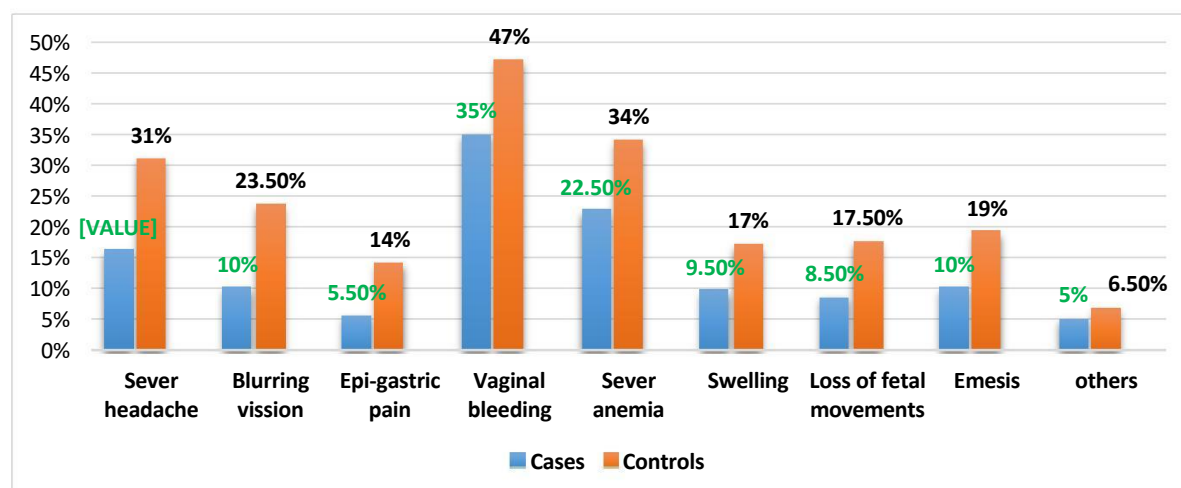


Figure 2: Case Control

3.1.6. Mother's Knowledge on Obstetric Complications

The most common obstetric complications stated by cases and controls were hemorrhage (53.5% and 67.5%), sepsis

(28.5% and 38.3%), still birth and neonatal death (10% and 16.5%), obstructed labour (9.5% and 14.5%), and pre-eclampsia and eclampsia (7% and 8.8%), (fig-3).

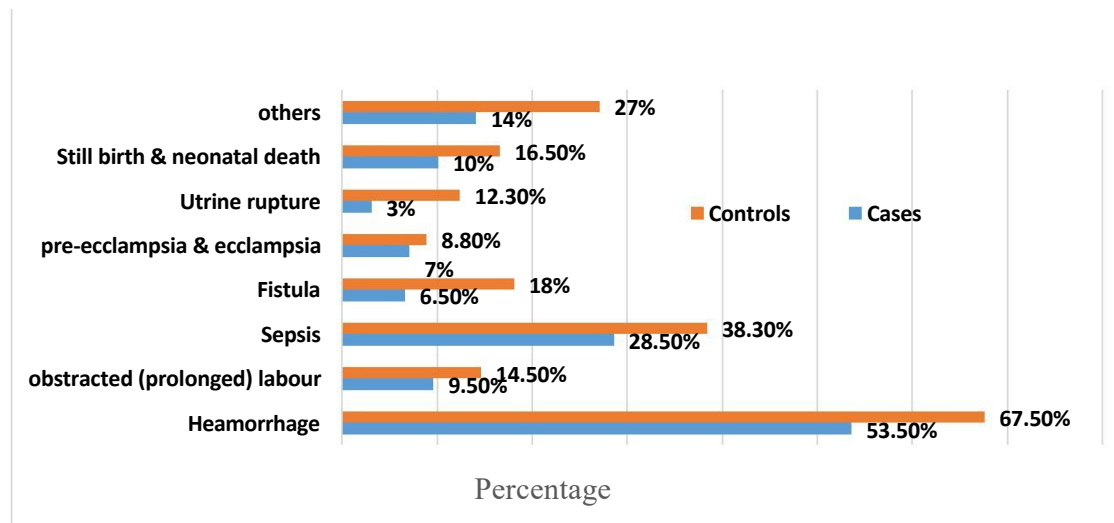


Figure 3: Percentage

3.1.7. Predictors of Place of Delivery

In the multivariate regression analysis, the odds of home delivery were 12 and 5 times greater among women who travels greater than 2 hours and 1-2 hours as compared with those who live nearer to the health facilities, (AOR:12.37, 95%CI: 4.57-33.5 and AOR: 5.38 95%CI: 2.11-13.74), respectively. Women who walk to the health facility on foot are 3 times greater to deliver at home as compared with counterparts (AOR: 3.1, 95%CI: 1.31-7.16). Skilled employers were 96% less likely to deliver at home as compared with women who are daily workers (AOR: 0.04, 95%CI: 0.003-0.53). The odds of medium birth interval were almost

2 times greater to give birth at home as compared with women who have distant birth intervals (AOR: 1.93, 95%CI: 1.03-3.63). Women with few or no ANC contact was strongly like to deliver at home. Women with “poor knowledge” of danger signs during pregnancy were 2 times greater to give birth at home as compared with those who had good knowledge (AOR: 2.44, 95%CI: 1.16-5.14). The odds of home delivery were 7.7 times greater among mothers with “poor knowledge” of obstetric complication as compared with mothers who had good knowledge (AOR: 7.7, 95%CI: 2.8-9.34) see Table-4.

Variables	Controls (%)	Cases (%)	COR(95%CI)	AOR(95%CI)
Residence				
Rural	290(72.5)	187(93.5)	0.356(0.12-0.95)*	0.75(0.21-2.75)
Semi-urban	88(22)	8(4)	2.19(0.67-7.21)	0.32(0.07-1.41)
Urban	22(5.5)	5(2.5)	1	1
Religion				
Protestant	11(2.7)	6(3)	0.98(0.37-2.79)	2.28(0.68-7.7)
Orthodox	54 (13.6)	25(12.5)	1.19(0.72-1.99)	1.1(0.24-4.52)
Catholic	48(12)	10(5)	2.66(1.31-5.40)*	0.57(0.18-1.86)
Muslim	287(71.7)	159(79.5)	1	1
Ethnicity				
Tigre	281(70.2)	162(81)	0.41(0.18-0.903)*	1.1(0.36-3.22)
Tigrigna	85(21.3)	30(15)	0.67(0.28-1.60)	0.67(0.18-2.45)
Blien	34(8.5)	8(4)	1	1
Maternal Education				
No education	71(17.7)	66(33)	0.12(0.06-0.27)**	1.12(0.39-3.18)
Primary	145(36.3)	93(46.5)	0.18(0.1-0.38)**	1.24(0.47-3.28)
Junior	105(26.2)	33(16.5)	0.36(0.17-0.81)*	0.75(0.28-2.03)

Secondary & above	79(19.8)	8(4)	1	1
Husband's Education				
No education	61(15.3)	60(30)	0.25(0.11-0.54)**	0.84(0.27-2.6)
Primary	95(23.7)	58(29)	0.40(0.19-0.86)*	0.41(0.13-1.23)
Junior	100(25)	41(20.5)	0.59(0.27-1.29)	0.5(0.17-1.48)
Secondary	103(25.7)	31(15.5)	0.81(0.036-1.8)	0.48(0.16-1.42)
College level	41(10.3)	10(5)	1	1
Time to reach to HF in minutes				
2+	70(17.5)	97(48.5)	0.06(0.03-0.15)**	12.37(4.57-33.5)**
1-2hrs	127(31.7)	78(39)	0.14(0.06-0.32)**	5.38(2.11-13.74)**
21-60min	122(30.5)	18(9)	0.58(0.23-1.47)	1.76(0.65-4.82)
< 20min	81(20.3)	7(3.5)	1	1
Means of transport				
On foot	276(69)	134(67)	0.43(0.21-0.87)*	3.1(1.31-7.16)*
Traditional transport	76(19)	56(28)	0.28(0.13-0.61)**	1.59(0.63-4.05)
Vehicle	48(12)	10(5)	1	1
Maternal occupation				
Housewife	339(84.7)	181(90.5)	2.49(0.85-7.31)	0.25(0.06-1.1)
Farmer	21(5.3)	10(5)	2.8(0.76-10.26)	0.19(0.03-1.01)
Skilled employee	34(8.5)	1(0.5)	45.33(4.76-431.29)**	0.04(0.003-0.53)*
Daily workers@	6(1.5)	8(4)	1	1
Birth intervals				
Close	110(27.5)	59(29.5)	0.55(0.32-0.93)*	1.6(0.79-3.21)
Medium	198(49.5)	114(57)	0.51(0.31-0.83)*	1.93(1.03-3.63)*
Distant	92(23)	27(13.5)	1	1
Number of ANC contacts				
<1x	16(4)	12(6)	0.13(0.05-0.33)**	8.68(2.42-31.1)**
2-3x	126(31.5)	110(55)	0.11(0.06-0.21)**	8.54(3.81-19.45)**
4x	135(33.7)	57(28.5)	0.23(0.11-0.45)**	3.91(1.79-8.51)**
>5x	116(29)	10(5)	1	1
Timing of ANC follow-up started				
1st Trimester (<12 weeks)	102	30	2.21(1.29-3.78)*	1.59(0.71-3.59)
2nd Trimester (12-24 weeks)	211	108	1.27(0.84-1.93)	1.63(0.87-3.03)
3rd Trimester (>24 weeks)	80	52	1	1
Knowledge of danger signs				
Not knowledgeable	311(77.7)	184(92)	0.3(0.17-0.53)**	2.44(1.16-5.14)*
Knowledgeable	89(22.3)	16(8)	1	1

Knowledge of obstetric complications				
Poor	330(82.5)	184(92)	0.64(0.23-1.81)	7.7(2.8-9.34)*
Moderate	56(14)	11(5.5)	1.81(0.54-6.08)	0.35(0.07-1.78)
Good	14(3.5)	5(2.5)	1	1

Table 4: knowledge of Obstetric Complications

3.2. Results of the Qualitative Data

3.2.1. Socio Demographic Characteristics of the FDG Respondents

Sociodemographic data of the FGD participant indicated that the majority of respondents were Muslim (66.6%) and of Tigre ethnicity (70.8%). Over half of the mothers

(58.4%) possessed a primary level education, while 37.5% of husbands had completed primary or junior levels. Approximately 45.6% of respondents reported a parity of five or more, and a significant proportion (45.8%) had family sizes exceeding seven members (see Table-5).

Variables	Cases (%)	Variables	Cases (%)
Residence of the Respondents		Maternal education	
Rural	6(25)	Illiterate	5(20.8)
Semi-urban	5(21)	Primary	14(58.4)
Urban	13(54)	Junior	5(20.8)
Age of the Respondents		Husbands' education	
< 18	0	Illiterate	2(8.3)
19-25	5(20.8)	Primary	9(37.5)
26-35	11(45.8)	Junior	9(37.5)
35+	8(33.3)	Secondary	4(16.7)
Marital status of the Respondents		Parity	
Married	23(95.8)	<2	4(16.7)
Single	0	3-4	9(37.5)
Separated/widowed	1(4.2)	5+	11(45.6)
Religion of the Respondents		Family size	
Muslim	16(66.6)	<2	0
Orthodox	4(16.7)	3-4	2(8.3)
Catholic	4(16.7)	5-6	11(45.8)
Protestant	0	7+	11(45.8)
Ethnicity			
Tigre	17(70.8)		
Tigrigna	5(20.8)		
Blien	2(8.3)		

Table 5: Marital Status of the Respondents

3.2.2. The main Findings of the FGD

Six women reported challenges related to maternal and child health that they faced during pregnancy and delivery in remote communities of the Anseba region were difficulties of transportation. My village is too far from the nearest HF and there is no transportation service" Home delivered women from Gheleb subzone. "There is a lack of transportation in

our village, and taxi or private car fees are prohibitively expensive. My relatives attempted to secure more affordable transportation options, but their efforts were unsuccessful due to time constraints. Consequently, I experienced a home delivery." (home delivery women in Hagaz subzone.) Among the twenty-four participants, seven women independently stated that inadequate transportation was the primary

factor leading to their most recent home delivery. "When my labour started, I couldn't find any private or governmental transportation. I couldn't even walk to the health facility because the baby was already engaged. These kinds of problems are what we face in our village." Home delivered women from Gheleb subzone. "I delivered my last child at home because of transportation difficulties to reach the nearest health facility" Home delivered women from Keren subzone "I delivered my baby at home. It was in the middle of the night, making it difficult to find any transportation service, and I couldn't get a ride to the maternity hospital." Home delivered women from Keren subzone. Five women narrated that distance, coupled with limited transportation access, was the reason for their home deliveries. "Our village is distant from the HF and has limited transportation. My husband wasn't at home, and I didn't get any person who could carry me to the HF. Even though I could reach the HF, no one would provide me water and food." Home delivered women from Gheleb subzone "My village is far from the health facility and lacks transportation. These reasons compelled me to deliver at home." Home delivered women from Hagaz subzone My village is remote and lacks transportation. When my labour started, my husband was not at home, and I couldn't find anyone or any vehicle to take me to the health facility." Home delivered women from Hagaz subzone A financial constraint was mentioned as predictors of home delivery. Among of the twenty-four women three were delivered at home due to unable to pay the taxi or transportation fee. "I have financial difficulties. I wasn't able to pay the taxi fee to take me to the maternity hospital. That's why I delivered at home" Home delivered women from Keren subzone "I have nothing at home so I couldn't afford to pay fee for transportation. Finally, I deliver at home" Home delivered women from Hagaz subzone "I wasn't able to pay the expenses of transportation. And the foods couldn't be divided with my children remained at home" Home delivered women from Hagaz subzone Some of the women delivered at home were initiated by relatives, elders, TBA and cultural beliefs of the communities they live. "An elder mother initiated me to deliver at home. She said to me, travelling to the HF was not necessary and I could give the services as the health professionals might give you" Home delivered women from Hagaz subzone "TBA advised me to deliver at home by her support. She said, 'I can help you in your home as the doctors can help you at the health facility'" Home delivered women from Hagaz subzone The un-well coming acceptance of the health professional or birth attendants triggers the delivering women to practice home delivery to their last child. "When I arrived at the health facility to deliver my first child, the nurse was not pleasant. He examined me once and said, 'Your cervix is not dilated.' He then left, telling me, 'Call me when your water breaks.' After he first saw me, I received no further examination or follow-up. I left the health facility and delivered my child on the way to my home, assisted by the women who were with me. From that day on, I decided to deliver my children at home." Home delivered women from Gheleb subzone "During an ANC follow-up, 8 pregnant mothers attended the ANC ward at 10:00 AM. I was one of them, and the nurse said, 'Since you are late, I am not going

to give you any services.' One of us replied, 'This might be our last contact, and we want to know our status and the progress of the fetus, please examine us.' He told us, 'Turn back, and it is good if you deliver at home.'" Home delivered women from Gheleb subzone "When I went to the health facility for my first delivery, the health professional seemed uninterested. He examined me only once upon admission. I remained at the facility for two days without receiving any further examination or follow-up. Feeling that my presence at the health facility was futile, I returned home and delivered with the help of a Traditional Birth Attendant (TBA). The placenta was retained. The TBA instructed me to jump to help expel it, but instead, I experienced heavy bleeding." Home delivered women from Hagaz subzone "For my first child, I couldn't find any transportation or anyone to take me to the health facility. Even though I somehow managed to reach the HF, I couldn't find any health personnel who would examine me or follow up with genuine interest. Consequently, I ended up giving birth to this child at home." Participant from Gheleb subzone Women's lack of knowledge in addition to long distance imposes them to practice home delivery in far rural communities. "My home is far from the health facility. I don't have any knowledge on the complication and harms that may arise during and after delivery on me and my baby" Home delivered women from Hagaz subzone "Our village is distant from the HF and has shortage of transportation. Health education by health professional concerning the complications and harms of home delivery on the mothers and baby health didn't hear before. So I haven't any experience before and I delivered at home" Home delivered women from Hagaz subzone The women who gave birth at home had a fair level of knowledge about the complications that can occur during home deliveries. Hemorrhage (37.5%) was the most commonly mentioned obstetrical complication. The second most mentioned condition was maternal death (29.2%), followed by retained placenta (24%), neonatal death (16.7%), missed first vaccination dose for the baby (16.7%), fistula (8.3%), infection (8.3%), abnormal fetal presentation (8.3%), and anemia (4.2%). Various home remedies were used to address the obstetrical complications or challenges encountered during home deliveries. "When the placenta didn't expel out, they kneel down and ate Ounqi. After I coughed the placenta started to expel" Home delivered women from Gheleb subzone "When I got infection, the women assisted me, they gave me tush (a small pieces burning wood) to smoke my body" Home delivered women from Gheleb subzone "After I deliver in my home, I have complained abdominal cramp and pain. The elderly women gave me leaves of Gered boiled with water to drink" Home delivered women from Hagaz subzone "Hemorrhage couldn't stop after I delivered; the elderly sited me in short and wide metal vessel (t'sti) and poured cold water on my head to stop the bleeding" Home delivered women from Hagaz subzone. during my labour the baby came by his foot. They made me upside down on the bed so that the baby can go back in and return with his head" Home delivered women from Hagaz subzone

4. Discussion

This study seated to dig-out factors influencing mother delivered at home in Anseba Region, Eritrea. In this study mothers who walks on foot and travels long distance to the nearest HF, low or no ANC contacts and mothers with poor knowledge of danger signs all had higher odds of home delivery as compared with mothers who had institutional delivery. However, the odds of facility delivery among mothers who had > 5ANC contacts, travel less than 60 minutes to the nearest HF, got vehicle transportation access and own good knowledge of pregnancy danger signs and obstetrical complication was significantly greater. ANC contact is a key aspect of maternal health, providing essential information about the risks and potential complications that may arise during pregnancy and delivery. The World Health Organization (WHO) 2016 recommends that every pregnant woman should have eight ANC visits during her pregnancy. Early initiation of ANC visits helps to reduce the risks associated with pregnancy, such as hypertension, anemia, congenital abnormalities, and HIV infection. This is achieved through interventions like iron and folic acid supplementation, as well as early screening and testing for HIV, hypertension, fetal heart beat and preparation for delivery. This study found a strong association between low or no ANC visits and home deliveries. Similar findings have been reported in studies conducted in Ethiopia, Malawi, and Nepal. Furthermore, research has shown that the proportion of facility deliveries increases as the number of ANC visits increases. This is because mothers who attain best information during ANC follow-up from health professionals about place of delivery, risks and problems of home delivery. And also, mother who start early ANC follow-up have a chance of early detection and treatment of pregnancy related problems which attributes to facility delivery [43-49].

Distance was found to be a significant predictor of home delivery. Women who must travel more than two hours to the nearest health facility are 11 times more likely to deliver at home than women who live less than one hour away from a health facility. Distance plays a key role in influencing institutional treatment-seeking behavior. It directly affects facility delivery, especially when combined with limited accesstotransportation. In Eritrea, the averaged distance to the nearest primary health facility in many rural communities' ranges from 10 km to 18 km. This finding is strikingly similar to the Eritrean Population and Health Survey (EPHS) 2010. and other studies The mode of transportation to the nearest health facility also significantly affects the likelihood of home delivery. This study found that mothers who travel on foot are 3.1 times more likely to give birth at home than those who travel by vehicle. These findings align with a study conducted in rural communities of Eritrea. The barriers of distance and lack of transportation should be addressed by implementing maternal waiting homes at remote health facilities, which can provide sustainable solutions. Over the last decade, several maternal waiting homes have been established in remote health facilities across the country. Maternal waiting homes are designed to reduce the challenges faced by mothers in reaching health facilities

during delivery. Mothers stay in these waiting homes for less than a month, receiving logistical and moral support from health facilities and local authorities. These initiatives should be expanded to all remote rural communities, with an evaluation of their efficacy and cost-benefit in the context of Eritrean communities. Although maternal waiting homes play a crucial role in reducing home deliveries, about 41.3% of the mothers in this study were unaware of the existence of maternal waiting homes at nearby health facilities. Birth interval was a good predictor of home delivery. Women with medium birth intervals were two times more likely to deliver at home than with distant birth spacing. The result of this study is contradicted with studies done in developing countries. Previous studies done in Eritrea revealed that child spacing is affected by shortage of contraception and lack of knowledge on the methods. But a study done in sub-Saharan African revealed the birth interval do not have effect on place of delivery [50-57].

Maternal occupation had effects on the place of delivery. Mothers who are skilled employees were 96% less likely to deliver at home than mothers who are daily workers. Studies revealed that maternal occupation has great demand in place of delivery. Because mothers who are skilled employees and have higher educational attainment develop self-autonomy and confidence. Moreover, skilled employees create potential of decision making for their health as well as their child so that at last will use facility delivery. Women who are skilled employees are free of financial dependence needed for transportation fees and others from their Knowledge about danger signs during pregnancy has been recognized as the predictors of home delivery. Mothers who have not awareness on the danger signs encountered during the pregnancy period are 2.4 times more likely to give birth at home as compared the mothers who are knowledgeable. The finding of this study is in agreement with studies done in different setting of Ethiopia Knowledge about danger signs during pregnancy has been recognized as the predictors of home delivery. Mothers who have not awareness on the danger signs encountered during the pregnancy period are 2.4 times more likely to give birth at home as compared the mothers who are knowledgeable. The finding of this study is in agreement with studies done in different setting of Ethiopia More than half of the participants from both of the quantitative and FGD, mentioned hemorrhage was the principal obstetric complication of home delivery. And also minority proportion of the cases from both types of study designs cited fistula, infection and anemia as complication happened when a mother practices home delivery. The finding of this study is consistent with studies done by The triangulated result of this study was revealed long distance to the nearest health facility, lack of transportation, low or no ANC contacts, poor knowledge of danger signs and obstetric complications were pin out as the main determinant causes of home delivery in Anseba region, Eritrea [58-61].

5. Conclusion

Home delivery in Eritrea's Anseba Region is primarily driven by poor geographic access, limited service utilization, low

socioeconomic status, and inadequate maternal knowledge. Women facing long travel distances or lack of transportation, poor ANC attendance and a lack of awareness regarding pregnancy danger sign and obstetrical complications are significantly more likely to deliver at home, a trend further exacerbated by low occupational status and short birth intervals. To address these challenges, the Ministry of Health and local governments must prioritize the establishment of maternity waiting homes in remote areas to eliminate transportation and distance barriers and costs. Strengthening community awareness through early ANC contact and the formation of local reproductive health committees can further bridge the gap between rural women and health services. Ultimately, delivering targeted health education through mass media and at ANC clinics is essential to promote the life-saving advantages of facility-based delivery.

Limitation of the Study

Due to a lack of baseline data from prior studies concerning communities in Eritrea, the research team unable to calculate the required sample size. Consequently, it was necessary to conduct a large sample size pilot study.

Abbreviations

ANC: Antenatal care; AOR: Adjusted odds ratio; CHA: community health agents; EPHS: Eritrean Population and Health Survey; FGD: Focus group discussion; LQAS: National lot quality assurance survey; MMR: Maternal mortality ratio; SSA: Sub-Saharan Africa; HF: health facility.

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Availability Of Data and Materials

The data supports the findings of this study are available from corresponding authors and can be accessed upon reasonable request.

Authors' Contributions

MWW designed and conceptualized the study, analyzed and interpreted the final manuscript for publication. MWW, BF, FG and ST are participated in the data collection. All authors have read and approved the manuscript.

Ethics Approval and Consents to Participate

Ethics approval was obtained from the Health Research and Ethics Committee, Ministry of Health, The State of Eritrea.

Consent For Publication

All participants gave consent for their direct quotes to be used in this final manuscript and agreed for its publication.

Competing Interests

The authors declare that they have no competing interests.

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