

Improving Practice of Institutional Delivery in Southern Ethiopia

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Abstract

Background Institutional delivery service utilization is one of the key and proven interventions to reduce maternal death. It ensures safe birth, reduces both actual and potential complications, and decreases maternal and newborn death. However, a significant proportion of deliveries in developing countries including Ethiopia occurs at home and is not attended by skilled birth attendants. This study aimed at determining the prevalence of home delivery and associated factors in three districts in Sidama Zone.

Methods A cross sectional survey was conducted from 15th- 20th October 2018. A multi-stage sampling design was employed to select 507 women who gave birth 12 months preceding the survey. Quantitative data were collected by using structured, interviewer administered questionnaires. Univariate and multivariate logistic regression models were run to assess factors associated with home delivery. Measures of association between factors and the outcome variable were reported using 95% confidence intervals (CIs) and adjusted odds ratios (aORs).

Results The response rate was 495(97.6%). The overall prevalence of home delivery was 113 (28%) with 95%CI (19%, 27%). Maternal rural residence, aOR=7.45(95%CI: 2.23-24.83); illiteracy of mothers, aOR=8.78 (95% CI: 2.33-33.01); those who completed grades 1-4, aOR =3.81(95% CI: 1.16-12.49); mothers who did not know the expected date of delivery, aOR=2.12 (95% CI: 1.21-3.71); mother being merchant, aOR=3.01(95%CI:1.44-6.3) and paternal illiteracy, aOR=3.27, (95% CI: 1.20-8.88) were predictors of home birth.

Conclusion The prevalence of skilled birth attendance in the study area has improved from the EDHS 2016 report of 26%. Uneducated, rural and merchant mothers were more likely to deliver at home. Interventions targeting rural and uneducated mothers might help to increase skilled birth attendance in the region.

Background

Maternal mortality is a major public health problem in developing countries particularly, in sub Saharan Africa (sSA) [1]. Every year, nearly half a million women and girls needlessly die as a result of complications during pregnancy or childbirth, and 99% of these deaths occur in developing countries of which 66% occur in sSA [1]. According to the joint WHO/UNICEF 2015 estimate, the global maternal death rate was 216/100,000 live births (LBs), while 436/100,000 LBs and 546/100,000 LBs maternal deaths were reported for least developed countries and sSA, respectively [2]. Based on a recent report, Ethiopia has one of the highest maternal, neonatal and infant mortalities with 412/100,000; 29 /1000 and 48/1000 LBs, respectively [3].

Most maternal deaths which occur in developing countries are due to complications during labor, delivery and the immediate postpartum period. WHO recommends for every delivery to be attended by skilled personnel. However, a significant proportion of women do not have this access during child birth [1,4].

The global skilled birth attendance estimate by 2015 revealed that 22% of deliveries did not get access to the service. In Eastern and Southern Africa, about 38% deliveries occurred at home [2]. In Ethiopia, community based surveys conducted in various regions of the country reported the magnitude of home deliveries to range from 31% to 96% [5-12]. Similarly, according to the Ethiopian Demographic Health Survey (EDHS) 2016, the prevalence of home delivery was reported to be 73% [3]. The consistently high prevalence of home deliveries in different parts of the country indicate that large proportion of pregnant mothers and their babies are at risk of complications including death related to child birth [1,2].

Available evidence revealed that several factors such as socio-economic status, maternal education, infrastructure, place of residence, women's experiences with healthcare providers and access to primary health care services significantly influence mothers' choice of place of delivery [13-16]. For example, a study from Nigeria and Ethiopia showed that women in the rural areas were more likely to regard facility delivery as unimportant and also complained about distance and inability to pay for the services [17].

According to the EDHS data – covering 2011 to 2015 – the prevalence of home birth in Southern Nations Nationalities and Peoples Region (SNNPR) was 74% [3]. However, as part of an ongoing implementation research of Kangaroo Mother Care (KMC) for low birth weight babies (weight less than 2000 grams) in Sidama zone, SNNPR, Ethiopia, the KMC Implementation Team (KIT) observed that there were very few home births which were reported by the health extension workers (HEWs), who are community health workers, – only 64 home births out of 31,000 (0.2%) (data not shown). While the low home birth rate which was observed by KIT could signal an improving health system in the region, it could also indicate poor tracking and reporting systems of home births by HEWs. To assess the real burden of home births in the area, we conducted a home survey in three districts of Sidama zone – Hawassa City Administration, Dalle and Shebedino districts. The aims of the survey were assessing the prevalence and determinants of home birth rate in three districts of Sidama zone, SNNPR.

Methods

Study setting

This survey was conducted at KMC implementation sites in SNNPR which included: Hawassa City Administration, Dalle and Shebedino districts in Sidama zone. Hawassa Comprehensive Specialized Hospital, Adare and Yirgalem General Hospitals, and Leku Primary Hospital serve as KMC implementation centers. Hawassa is the capital city of SNNPR and is located 275 km south of Addis Ababa, the capital of Ethiopia. Hawassa City Administration has eight sub-cities consisting of a total of 32 kebeles. The estimated total population size of Hawassa city in 2017 was 455,658 as projected from

the 2007 Ethiopian national census [18]. It is estimated that there are over 10,000 deliveries taking place in Hawassa every year. There are 3 public hospitals and 12 health centers in the city.

Shebedino district, the second study area is located 30km south of Hawassa city and has 32 Kebeles. Leku town is a capital of Shebedino district. There is one primary hospital, 9 health centers and 32 health posts in the district. An estimate of 121 deliveries is attended per month in Leku Primary Hospital.

The total population of Dalle district in 2017 was 317,246 with 11104 expected deliveries per year (18). Yirgalem town is the capital of the district and is located 45kms south of Hawassa. There is one General hospital, 10 health centers and 36 health posts in the district.

Study design and Population

A community based cross-sectional survey was conducted during 15th- 20th October, 2018. Randomly selected mothers who gave birth in the last one year and residing at least 6 months in the area were included in the study.

Sample size

The sample size was calculated using Epi info 7 Statistical software for population survey. The assumptions considered were: proportion of 72.5% home delivery in SNNPR based on EDHS 2016, confidence level of 95%, margin of error 5%, design effect of 1.5 with a cluster of 10 and 10% non-response rate. The final sample was calculated as 506[3].

Sampling procedures

A multistage sampling technique was used to reach to the study participants. There are 32 kebeles in Hawassa city, 35 in Dalte and 32 in Shebedino districts. We selected 11 kebeles [4 kebeles from Hawassa City, representing urban households (36%); 4 from Dalte and 3 from Shebedino Woredas, both representing rural households (64%)] using simple random sampling techniques. Then, households with mothers who gave birth during the last 12 months preceding the study were identified and listed with the help of family folder available at the health posts of the selected 11 kebeles. Finally, the calculated sample size was proportionally allocated to the kebeles based on identified number of eligible mothers. Mothers in each of the selected kebeles were randomly selected by simple random sampling technique using the list as a sampling frame.

Method of data collection

The questionnaire was primarily prepared in English and then translated to local languages: “Sidamu Afoo” for rural residents and “Amharic” for urban residents. Six data collectors who completed at least first degree in Public Health were recruited and one-day training was given. Face to face interview with structured questionnaire was used to collect data. Consent was obtained from the selected mothers. Evaluation team of KMC implementation project supervised the data collection.

Data analysis

The data were coded, entered and cleaned using Epi Info version 7.2 software package and exported to SPSS version 25 software for analysis. Descriptive, bivariate and multivariate analyses were done to assess for association between independent factors and place of delivery. Odds ratios and 95% CIs were computed. In multivariate analyses, variables having with p -value < 0.2 in bivariate analysis were re-entered in the model, such as place of residence, age, education and occupation of mothers, paternal education, distance of health center from home, family size, knowing the due date and birth order of the child (parity). Statistical significant association was declared with a p -value < 0.05 in the multivariate model.

Results

Socio-demographic characteristics of the respondents

We interviewed 495(97.6%) out of the selected 507 mothers who had given birth 12 months preceding the survey. The mean (\pm SD) age of the participants was 25.85(\pm 4.95) years; 339 (68.5%) and 156 (31.5%) were rural and urban residents, respectively. Two hundred and seven (42%) respondents completed grades 5-8 while 61(12.3%) did not attend school. Majority, 377(76.2%) of mothers were housewives and less than half (45%) of them had at least five family members (Table 1).

Table 1: Socio-demographic characteristics of mothers with 0-12 month's old children at three sites in Sidama Zone, 2018

Characteristics	Frequency (%)
Age (years)	
<=20	92(18.6)
21-25	165(33.3)
26-30	169(34.4)
>30	69(14)
Level of education	
No class attended	61(12.3)
Grade 1-4 completed	90(18.2)
Grade 5-8 completed	207(41.8)
Grade 9-10 completed	71(14.30)
Higher than grade 10	66(13.3)
Occupation	
Housewife	381(78.1)
Merchant/Employed	107(21.9)
Fathers education	
No class attended	43(8.70)
Grade 1-4 completed	36(7.3)
Grade 5-8 completed	164(33)
Grade 9-10 completed	122(24.6)
Higher than grade 10	130(26.3)
Household's monthly income	
Low(<1000ETB)	170(34.3)
Medium (1000-1999 ETB)	132(26.7)
Higher income (>=2000ETB)	91(18.4)
Unknown income(unreported)	102(20.6)
Distance from HH to HC	
<30 minutes' walk	213(43)
30-<60 minutes' walk	282(57)

Total Family members	
<5 members	274(55.4)
>=5members	221(44.6)

Antenatal care follows up and plan of place of delivery

Out of 495 mothers, 473(95.6%) had ANC follow up; 244 (51.6%) had at least 4 visits during the whole pregnancy of the index child. Three hundred sixteen (64%) of the mothers attended ANC in health centers. Three hundred forty-seven (70%) mothers knew the due date of the index child. Four hundred eighty two (97.4%) mothers planned their place of delivery; 309 (63.2%) preferred health centers, 102 (21%) preferred government hospitals and 62 (12.5%) preferred to deliver at home. Concerning preference of birth attendants, 415 (83.8%) respondents wished their delivery to be attended by skilled health professionals while 80 (16.2%) wanted their mothers, relatives or traditional birth attendants to be their birth attendants.

Characteristics of deliveries

The overall prevalence of home delivery was 113 (22.8%, 95%CI: 19%, 27%). Home delivery rate among mothers from rural residence was 108(32%, 95%CI: 27.6-36%) while 5(3.2%) of mothers residing in urban settings delivered at home (Table 2). One hundred twelve (72%) of urban women gave birth at government hospitals while 166(49%) of the rural women delivered at health centers. Some of the reasons cited by participants for home births included: health facilities are inconvenient 44(40.7%), personal preference to deliver at home 39(36.3%), delivering at health facilities is unnecessary 20(18.5%), fear of delivering on the way to health facility 15 (14%) and lack of transportation (10%) (Table 2).

Table 2:Delivery characteristic of participants at KMC implementation sites, Sidama Zone

Variables	Categories	Frequency (%)
Birth place of the index child	HC	193(39)
	Hospital	175(35.4)
	Home	113(22.8)
	Private clinic/hospital	14(2.8)
Reasons for home births, n=113)	HFs are inconvenient	45(40)
	Personal preference	41(36.3)
	Unnecessary to give birth at HFs	20(18)
	Fear of delivering on the way to HF	16(14)
	No transportation	11(10)
	Health Professionals (HPs) are not friendly	3(0.6)
Mode of delivery of the index child	SVD	448(90.5)
	CS	47(9.5)
Attendant of the delivery of the index child	Doctors	56(11.3)
	Nurses/Midwifery	203(41)
	unknown health	132(26.7)
	Female relatives/friends	57(11.5)
	TBA	28(5.7)
	No one (mother herself)	9(1.8)
	Others	25(5.1)

The proportion of home delivery significantly varied by districts ($X^2=63$, $DF=2$, $p.value<0.001$). In Shebedino district, majority of the mothers gave birth at home compared to Dalle and Hawassa districts (fig 1)

Figure 1: Place of delivery cross tabulated by the study districts

Factors associated with Home delivery

Rural residents, merchants(traders), mothers with no education or attended grades 1-4, uneducated fathers, knowledge of due date of their index child and planned place of delivery are factors statistically associated with home delivery.

Mothers residing in rural areas were 7.45 times more likely to deliver at home as compared to urban dwellers, aOR=7.45(95%CI:2.23-24.83). Similarly, the odds of home birth among uneducated mothers and those completed grades 1-4 was, aOR=8.78(95% CI: 2.33-33.01) and 3.81(95% CI: 1.16-12.49) times higher than those who completed at least grade 9, respectively. The odds of home birth among mothers who did not know the due date of their index child was two folds higher compared to those who knew it, aOR=2.12(95%CI: 1.21-3.71). Furthermore, mothers whose husbands did not go to school were about 3 times more likely to deliver at home compared to their counter parts, aOR=3.27, 95% CI: 1.20-8.88)(Table 3).

Table 3: Bivariate and multivariate analyses of factors associated with home deliveries at KMC implementation sites, Sidama Zone, -2018

Variables	Categories	Place of delivery		COR	AOR
		Home (%)	Health facility (%)	(95%CI)	(95% CI)
Place of residence	Rural	108(95.6)	231(60.5)	14.12(5.63-35.42)	5.28(1.25-22.16)
	Urban	5(4.4)	151(39.5)	1.0	1.0
Age of mothers	<=20 years	12(10.6)	80(20.9)	1.0	1.0
	21-25 years	33(29.2)	132(34.6)	1.67(0.81-3.41)	1.34(0.49-3.55)
	26-30 years	46(40.7)	123(32.2)	2.49(1.24-4.99)	1.32(0.40-4.32)
	>30 years	22(19.5)	47(12.3)	3.12(1.42-6.88)	0.96(0.24-3.95)
Maternal education	No class attended	33(29.2)	28(7.3)	31.11(11.16-86.73)	8.78(2.33-33.01)
	Grade 1-4 completed	32(28.3)	58(15.2)	14.56(5.4-39.27)	3.81(1.16-12.49)
	Grade 5-8 completed	43(38.1)	164(42.9)	6.92(2.67-17.97)	2.09(0.70-6.24)
	Grade 9-10+ completed	5(4.4)	132(34.6)	1.0	1.0
Maternal Occupation	Housewife	89(80.2)	292(77.5)	1.0	1.0
	Employed/Merchant	22(19.8)	85(22.5)	1.18(0.69-1.99)	3.01(1.44-6.3)
Fathers' education	No class attended	25(22.1)	18(4.7)	19.19(8.79-41.91)	3.27(1.20-8.88)
	Grade 1-4 completed	15(13.3)	21(5.5)	9.87(4.32-22.54)	2.63(0.99-6.98)
	Grade 5-8 completed	56(49.6)	108(28.3)	7.17(3.98-12.91)	2.15(1.04-4.45)
	Grade 9-10+ completed	17(15.0)	235(61.5)	1.0	1.0

Distance of HH from HC	<30 minutes' walk	36(32)	177(46.3)	1.0	1.0
	30-<60 minutes' walk	77(68)	205(53.7)	1.85(1.18-2.88)	0.76(0.42-1.40)
Total number of Family members	<5 members	52(46)	222(58)	1.0	1.0
	>=5members	61(54)	160(42)	1.63(1.10-2.48)	0.83(0.41-1.66)
No of ANC Visits (n=474)	1 ANC	4(4.2)	6(1.6)	4.42(1.18-16.51)	-
	2 ANC	26(27)	49(13)	3.51(1.92-6.43)	-
	3 ANC	34(35.4)	111(29.4)	2.03(1.19-3.46)	-
	4+ ANC	32(33.3)	212(56.2)	1.0	-
Knew the due date for the index child	Yes	59(52.2)	288(75.4)	1.00	1.00
	No	54(47.8)	94(24.6)	2.80(1.81-4.34)	2.12(1.21-3.71)
Planned place of delivery for the index child	Yes	101(89.4)	381(99.7)	1.0	1.0
	No	12(10.6)	1(0.3)	45.26(5.82-352.25)	64.5(6.54-635.8)
Birth order of the child	First order	23(20.4)	146(38.2)	1.0	1.0
	2-3 rd order	53(46.9)	171(44.8)	1.97(1.15-3.37)	1.44(0.61-3.41)
	4 th or more order	37(32.7)	65(17.0)	3.61(1.99-6.56)	1.91(0.61-6.24)

Discussion

In the current study, the proportion of mothers who gave birth at home was 22.8% (32% and 3.2% among mothers from rural and urban areas, respectively). The prevalence of home delivery observed in this study is comparable with figures reported by a study conducted in Bench Maji Zone (21.7%) of southern Ethiopia [19].

On the other hand, the prevalence of home delivery reported in this study is much lower than the figures reported by studies conducted in different parts of Ethiopia. For instance, 66% and 74.1% home deliveries were reported, respectively from Bambia and Liban districts [20, 21]. This difference might be attributed to various factors. First, the current study area has better access to infrastructures such as roads and means of transportation which is likely to decrease home delivery [22]. A relatively higher prevalence of home delivery observed in Shebedino district is likely affected by other socio-cultural factors that need to be further explored. Overall, access to local mass media in local languages, access to health infrastructure and leadership, efforts of public institutions in promoting institutional delivery and factors related to demographic and socioeconomic characteristics could also be among the anticipated factors leading to low prevalence of home delivery in the study area.

More than two-thirds of respondents participated in this survey fell in the age range of 21-30 years implying that the study included mothers in high age-specific fertility rate. In terms of illiteracy rate, only one in ten mothers did not attend any formal education. This indicates that, women in the study area are well educated compared to figures reported by similar surveys [16,17]. These are additional factors that are likely to attribute to the observed remarkable decline of home delivery in the study area compared to figures reported by EDHS 2016 [3].

Our findings showed that mothers residing in rural areas were five times more likely to give birth at home compared to those living in urban areas. The difference could be attributed to better access to information for mothers living in urban settings. Several similar studies reported that place of residence and distance from health facilities are among common predictors of home birth [21, 4, 17, 23]. Our study calls for better strategies to reach the rural community to avert home births.

Level of maternal education and type of occupation as determinant factors of home delivery were well demonstrated in the current study. Uneducated mothers are less empowered and are unable to make use of multiple sources of information related to complicated pregnancies [15]. Moreover, uneducated mothers are also more likely to be influenced by socio-cultural phenomena which discourage institutional delivery thus, increasing proportion of uneducated mothers who prefer home birth. This was well demonstrated by this study and consistently supported by similar surveys [15, 21, 23]. Paternal education demonstrated similar effect as maternal education. Mothers from uneducated male partners are more likely to deliver at home compared to those who are married to educated male partners. Existing evidence from similar studies have reported consistent findings [21, 24]. Educated male partners are well informed

risks related to home birth and thus, are more likely to encourage and financially support their wives to deliver at health facilities.

One unique observation of the current study is that merchant mothers were found to be more likely to deliver at home compared to housewives. Merchant mothers are considered to be more mobile because of the nature of their work, more likely to use contraceptives and have better awareness compared to housewives. The finding of this study is contrary to this reality requiring further investigation. Lack of early plan of place of delivery and lack of preparedness for institutional delivery are among the factors that increase the probability that mother could give birth at home.

Limitations Of The Study

Being a cross-sectional, this study may not give picture of trends in home delivery status among the study population. However, this survey is the first of its type for the site to reveal reasons for home births and assists policy makers and health system leadership to design ways of handling the case.

Conclusions And Recommendations

The prevalence of home birth has significantly dropped in the study setting compared to figures reported in 2016. Parental and maternal education, mother's occupation, and place of residence and planned place of delivery were found to be predictors of home delivery.

We recommend interventions targeting rural and uneducated parents to further reduce home births.

Declarations

Abbreviations

aOR: Adjusted odds ratio; CHW: community health worker; CI: confidence interval; EDHS: Ethiopian Demographic and Health Survey; KIT: KMC implementation team; KMC: Kangaroo Mother Care; LBs: Live births; SD: Standard deviation; SNNPR: Southern Nations Nationalities and Peoples Region; ;sSA: sub-Saharan Africa; UNICEF: United Nations International Children's Fund ;WHO: World Health Organization

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Availability of data and material

Full range of data analyzed and questionnaire used in the study can be provided up on request.

Authors' contribution

All authors listed have contributed in initiating and refining the research idea through a series of discussions, development of protocol, data collection, analysis and write up of the findings.

Authors's information

All authors participated in this study are academic staff at the College of Medicine and Health Sciences at Hawassa and Addis Ababa Universities, Ethiopia. The academic ranks of the authors range from a lecturer to associate professors.

Competing interest

The authors have no any competing interest

Ethics approval and consent to participate

The Hawassa University Institutional Review Board approved the study. Consent was obtained from all mothers participated in the survey and local health authorities gave permission for the conduct of the study.

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Figures

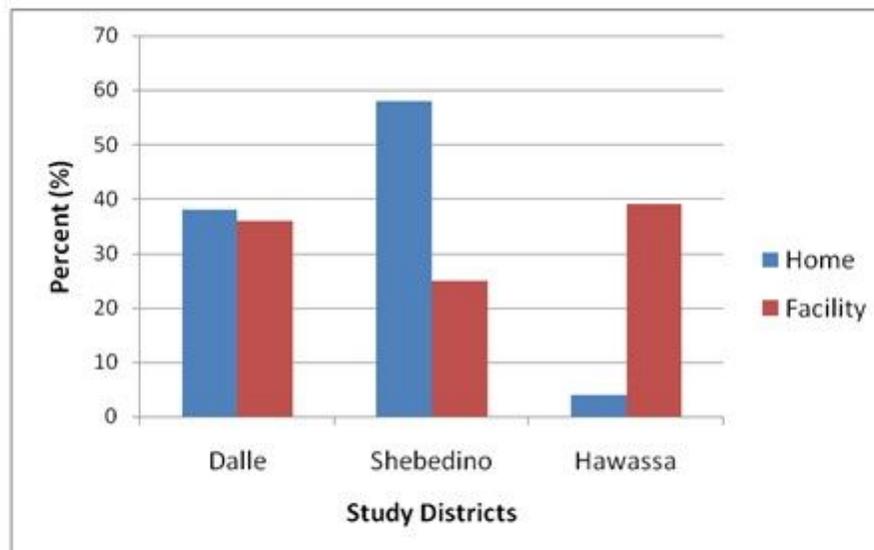


Figure 1: Place of delivery cross tabulated by the study districts

Figure 1

Place of delivery cross tabulated by the study districts