

Original Article

Stillbirth and associated Factors among Women Who Gave birth at Dore-Bafano Primary Hospital, Southern Ethiopia, 2023, Facility Based Cross Sectional Study

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Abstract

Background: Over 2 million babies (1 every 16 seconds) are stillborn each year, of which 84% are in low- and middle-income countries. The global incidence of stillbirth ranges from 3.4-36/1000 total births in high-income countries and in the Sub-Saharan and Asia regions. In Ethiopia, despite the governmental and non-governmental efforts to reduce the rate of stillbirth, prevention of stillbirth has remained largely unaddressed. This research aims at narrowing the gap on understanding the magnitude and possible factors of stillbirth.

Objectives: To assess the magnitude of stillbirth and associated factors among women who gave birth at Dore-bafano Primary Hospital 2023.

Methods: Facility based cross-sectional study was conducted by reviewing medical records of 518 randomly selected births at Dore-bafano Primary Hospital from May 3 to 18, 2023. The data were extracted using a structured checklist by trained data retrievers and checked for its completeness, edited, cleaned and entered into Epi data version 4.7 and exported to SPSS version 29. Bivariable and multivariable binary logistic regression analysis were done to identify associated factors of stillbirth. Associations were measured using both crude and adjusted odds ratios. Finally p-value < 0.05 together with 95% confidence interval were used to determine statistical significance.

Results: The prevalence of stillbirth was 3.38% (95% CI: 2%-5.4%) or 33.8 cases/1000 live births within the sample. Several factors were identified as independently associated with stillbirth, including gestational age less than 37 weeks [AOR=0.024 (95% CI: 0.002-0.37)], obstructed labour [AOR=30.26 (95% CI: 1.14-804.20)], duration of labour exceeding 18 hours [AOR=17 (95% CI: 1.23-253.35)] and congenital anomalies [AOR=19 (95% CI: 1.33-295.02)].

Conclusions: The prevalence of stillbirth in this study was high as compared to the global as well as the national stillbirth rate. Factors such as gestational age less than 37 weeks, obstructed labor, duration of labor exceeding 18 hours and congenital anomalies were found to be independently associated with stillbirth. Therefore, it is crucial for healthcare providers at Dore-bafano Primary Hospital to prioritize early detection and management of these risk factors to reduce the occurrence of stillbirths.

Keywords: Stillbirth, Associated factors, Gave Birth, Dore-bafano, Primary Hospital

Introduction

According to World Health Organization (WHO), the birth of a new born after twenty-eight completed weeks of gestation weighing 1,000gm or more, with baby showing no signs of life after delivery is a still born (1-3). Stillbirths (SBs) can be classified based on either physical appearance as macerated and fresh or time to death as death before labour and death occurs during labour. Conducting a complete and careful evaluation is one of the most important ways to identify a cause for the stillbirth. Even when the cause may seem obvious, additional tests may provide information useful for counseling purposes. Many SB evaluation protocols have been published, all of which include a careful medical history, a post-mortem autopsy, an evaluation of the placenta, and genetic testing (typically a chromosomal microarray) (4). Despite the advancement in diagnostic tools and autopsy, the cause of a large proportion of SB is not known (5,6). Globally two-thirds to three-quarters of SBs may occur during the antenatal period before labour begins, which are often associated with insults that occur in-utero during the antenatal period. These SBs are due to a variety of factors including bacterial infection, birth defects especially pulmonary hypoplasia, maternal diabetes, hypertensive diseases in pregnancy, maternal alcohol consumption, cigarette smoking, post term pregnancy, abruption placentae, radiation

poison, physical trauma, rhesus disease, umbilical cord accidents and intra uterine growth restriction. Intra partum SBs are usually the result of fetal distress and or obstructed labour and often reflect poor quality of clinical care during labour and at delivery (7-9). The most significant biomedical causes of SB include antepartum haemorrhage, maternal conditions affecting placental sufficiency and fetal growth (e.g., hypertension and diabetes), infections (e.g., syphilis and group B streptococcus), complications during childbirth, and genetic conditions (10). SBs are often referred to as the invisible death (11). It is an adverse pregnancy outcome and tragedy, which causes a substantial psychological burden to the mother and the families (1,2).

Over 2 million babies are stillborn each year (1 every 16 seconds), of which 84% are in low- and middle-income countries (LMICs), notably in south Asia and sub-Saharan Africa (SSA). In 2019, 3 in 4 SBs occurred in SSA or southern Asia (2,12). In Ethiopia, the world health statistics in 2013 revealed a stillbirth rate of 26/1000 deliveries which is the third highest in the eastern Africa countries, next to Djibouti and Somalia (with SB rates of 34 and 30 per 1000 births, respectively) and seventh among the ten countries that account for two-thirds of all third trimester SBs in the world (13).

Currently evidence strongly recommended 10 for implementation: Preconception folic acid fortification, insecticide-treated bed nets or intermittent preventive treatment for malaria prevention, syphilis detection and treatment, detection and management of hypertensive disease of pregnancy, detection and management of diabetes in pregnancy, detection and management of fetal growth restriction, routine induction to prevent post-term pregnancies, skilled care at birth, basic emergency obstetric care and comprehensive emergency obstetric care (14). Assessment of the burden of SB and associated factors in health care setup is important for developing strategies to prevent or reduce SBs. The government of Ethiopia had been implementing different effective programs to improve maternal and child health through capacity building and strengthening the healthcare delivery system to improve the quality of service during pregnancy such as antenatal care and safe delivery practice (15). Despite the governmental and non-governmental (NGO) efforts to reduce the rate of SB, prevention of SB has remained largely unaddressed (16).

Methods

Study design, setting, and period

Facility based cross-sectional study was carried out at Dore-bafano Primary Hospital, Sidama Regional State, Ethiopia. The district has a total population of 180,000 the number

of reproductive age group women (number of women) is must be needed. The Hospital is found at Dore-bafano town which is located 23 km away to the west from the capital of the region, Hawassa city. The study was conducted from March 10 - 9, 2022 - 2023.

Population, sample size determination and sampling procedure

All records of women who gave birth at Dore-bafano Primary Hospital were the source population. Randomly selected records of women who gave birth at Dore-bafano Primary Hospital from March 10 - 9, 2022 - 2023 were the study population. All the document review of women who gave birth at Dore-bafano Primary Hospital were included, while records of women who gave birth with gestational age of < 28 weeks, those who had incomplete medical records and those with missing charts were excluded. The sample size for first objective was calculated using a single population proportion formula with the consideration of proportion 8.6% (17), margin of error (d) 3%, 95% Confidence level and considering 10% for none retrieval rate. Then after by substituting the above figures in to the sample size calculation, the calculated sample size becomes 369. Sample size for the second objective, which was factors identification, was calculated using double population proportion formula using Epi info version 7.2. According to the sample size calculation for the selected risk factors, 518 was the largest

value and taken as the final sample size. Systematic random sampling technique was used to select study subjects from the log book within the Hospital. Sampling interval ($K=3$) was determined by dividing the expected number (1456) of deliveries attended in a one

year period of the previous year to the total sample size (518) the sampling interval becomes 3. The first mother from the delivery register was identified using a lottery method (Figure 1).

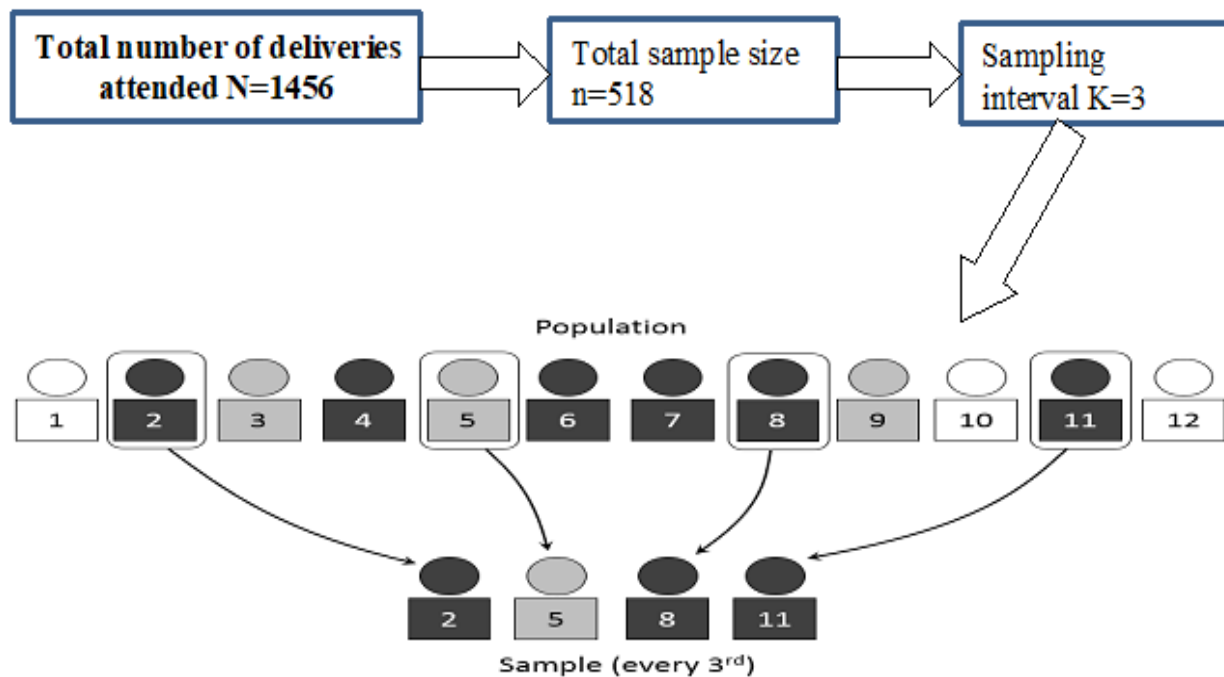


Figure 1. Schematic presentation of sampling procedures for assessing the magnitude of SB and associated factors among mothers who gave birth at Dore-bafano Primary Hospital Sidama, Ethiopia, 2023

Data collection techniques and quality assurance

Data were extracted by midwives through a checklist that included socio-demographic details (such as age, parity and other socio-demographic factors), maternal characteristics such as period of gestation, onset of labour, complications during pregnancy and labour (obstetric, medical or surgical) and mode of deliveries) and perinatal data (such as birth weight, gestational age and sex, APGAR score at

birth, and possible causes of death). To have common understanding on the tools, detail orientations were given for all data extractors and supervisor, day to day activities during data retrieving was supervised and evaluated for errors and was corrected by the principal investigator before the following day activity and health professionals were involved in the data extraction process.

Study variables and operational definitions

➤ The dependent variable of this study was stillbirth (SB).

Whereas, the independent variables were:

➤ Socio-demographic characteristics: Maternal age, ethnicity, religion, place of residence, marital status.

➤ Maternal/obstetric characteristics: Gravidity, parity, gestational age in weeks, ANC follow up and number of visits, pre-eclampsia, eclampsia, malpresentation, obstructed labour, PROM, APH, pre-term labour, uterine rupture, umbilical cord accidents, amniotic fluid disorders, Rh isoimmunization, number of gestation, previous history of SB, onset of labour, duration of labour in hours, mode of delivery and use of partograph.

➤ Maternal medical related factors: Hypertension, diabetes mellitus, cardiac diseases, maternal hemoglobin in mg/dl, UTI, IP, malaria, syphilis and chorioamnionitis.

➤ Fetal conditions: Sex of the fetus, birth weight, number of gestation (singleton, twins), lethal congenital anomalies, perinatal asphyxia, fifth minute APGAR score, MSAF and birth trauma.

Live birth: Is the complete expulsion or extraction of a product of conception from its mother; which, after such separation, The majority (68.6%) of the study participants were between 20-34 years of age.

breathes or shows any other evidence of life is considered live birth (18).

Stillbirth: Is death prior to the complete expulsion or extraction of a product of conception from its mother; the death is indicated by the fact that after such separation the fetus does not breath or show any other evidence of life (19).

Data processing and analysis

The data were checked, edited and cleaned for its completeness and entered in to Epidata version 4.6 and exported to SPSS version 29 for analyses. Bivariable and multivariable binary logistic regression analyses were done to identify associated factors. Associations were measured using both crude and adjusted odds ratio. Variables with p-value < 0.25 during bivariable binary logistic regression analyses were considered for multivariable binary logistic regression analyses to control for all possible confounders. Finally p-value < 0.05 together with 95% confidence interval were used to determine the statistical significance and the data were described and presented by using narration, tables and graph.

Results

Socio-demographic characteristics of study subjects

The mean and standard deviation (mean \pm SD) of the respondents age was 27.62 (\pm

6.65) years. The minimum and maximum ages of the study subjects were 17 and 43, respectively. Additionally, more than half,

269 (53.5%) of the study subjects resided in urban areas and 326 (64.8%) were married (Table 1).

Table 1. Sociodemographic characteristics of study subjects (n = 503) at Dore-bafano Primary Hospital, Sidama, Southern Ethiopia, 2023.

Variables	Frequency	Percent (%)
Age		
< 20	71	14.1
20-34	345	68.6
≥35	87	17.3
Ethnicity		
Sidama	394	78.3
Wolaita	61	12.1
Others**	48	9.6
Religion		
Protestant	394	78.3
Muslim	60	11.9
Orthodox	49	9.8
Residence		
Urban	269	53.5
Rural	234	46.5
Marital status		
Married	326	64.8
Unmarried	44	8.7
Not stated	133	26.4

**Other ethnicity: Amhara, Kambata, Oromo

Maternal/obstetrics characteristics

More than half 284 (56.5%) were multiparous. Nearly 9 in 10 of the study subjects 440 (87.5%) were greater than or equal to 37 weeks of gestational age. The mean and standard deviation of gestational age were 37.34 and 1.693 weeks, respectively. A history of pre-eclampsia was noted in 31 (6.2%) cases, while 13 (2.6%)

cases had eclampsia. Uterine rupture was reported in 9 (1.8%) mothers, while umbilical cord prolapse occurred in 8 (1.6%) cases. The mean duration of labour was 12.32 hours with the standard deviation of (\pm SD) 4.945. Parthograph was not used in 75 (14.9%) of the cases (Table 2).

Table 2: Maternal/obstetrics characteristics of study subjects (n = 503) at Dore-bafano Primary Hospital, Sidama, Southern Ethiopia, 2023.

Variables	Frequency	Percent		
Gravidity			Preterm labour	
Primigravida	219	43.5	No	459 91.3
Multigravida	284	56.5	Yes	44 8.7
Parity			Uterine rupture	
Nulliparous	219	43.5	No	494 98.2
Multiparous	284	56.5	Yes	9 1.8
Gestational age			Umbilical cord accidents	
<37 weeks	63	12.5	No	495 98.4
≥37 weeks	440	87.5	Yes	8 1.6
ANC follow up			Amniotic fluid disorders	
No	135	26.8	No	493 98.0
Yes	368	73.2	Yes	10 2.0
Number of ANC visits			Number of gestation	
<02 visits	90	24.5	Singleton	481 95.6
02-04 visits	261	70.9	Twins	22 4.4
>04 visits	17	4.6	Previous history of stillbirth	
Preeclampsia			No	469 93.2
No	472	93.8	Yes	26 5.2
Yes	31	6.2	Not stated	8 1.6
Eclampsia			Onset of labour	
No	490	97.4	Induced	74 14.7
Yes	13	2.6	Spontaneous	429 85.3
Malpresentation			Duration of labour in hours	
No	467	92.8	≤18	426 84.7
Yes	36	7.2	>18	72 14.3
Obstructed labor			Not stated	5 1
No	492	97.8	Mode of delivery	
Yes	11	2.2	Spontaneous vaginal delivery	337 67.0
Premature rupture of membrane			Instrumental delivery	106 21.1
No	466	92.6	Cesarean-section	53 10.5
Yes	37	7.4	Destructive delivery	7 1.4
Antepartum hemorrhage			Partograph use	
No	484	96.2	No	75 14.9
Yes	19	3.8	Yes	428 85.1
Type of APH				
Abruptio placenta	13	68.4		
Placenta previa	6	31.6		

Maternal medical related factors

Regarding the previous medical history of the mothers, the lowest record was chorioamnionitis, accounting for 7 cases (1.4%), while the highest record was anemia

(hgb <11 gm/dl), with 140 cases (27.8%). The mean hemoglobin (hgb) level was 11.89 gm/dl with sd of ± 1.36 . Additionally, 27 mothers (5.4%) had had hypertension, 16 (3.2%) had diabetes mellitus and 10 (2%) had cardiac disease. Furthermore, 71 mothers

(14.1%) experienced urinary tract infections and 53 (10.5%) had intestinal parasitosis respectively (Table 3).

Table 3. Maternal medical related factors of study subjects (n = 503) at Dore-bafano Primary Hospital, Sidama, Southern Ethiopia, 2023.

Variables	Frequency	Percent
Hypertension		
No	476	94.6
Yes	27	5.4
Diabetes mellitus		
No	487	96.8
Yes	16	3.2
Cardiac disease		
No	493	98.0
Yes	10	2.0
Maternal hemoglobin(gm/dl)		
≤11	140	27.8
>11	345	68.6
Not stated	18	3.6
Urinary tract infections		
No	432	85.9
Yes	71	14.1
Intestinal parasitosis		
No	450	89.5
Yes	53	10.5
Malaria		
No	488	97.0
Yes	15	3.0
Syphilis		
No	494	98.2
Yes	9	1.8
Chorioamnionitis		
No	496	98.6
Yes	7	1.4

Fetal Conditions

Out of 503 mothers, 7 (1.4%) gave births to a congenitally malformed baby, 406 (80.7%) babies had fifth minute APGAR score of over 8. Regarding birth weight of baby, 60 (11.9%) had high birth weight (> 4000gm) while 415 (82.5%) had normal birth weight (2500-4000) and only 28 (5.6%) had low birth weight (<2500gm). More than half, 274 (54.5%) were female and only 04 (0.8%) had birth trauma (Table 4).

Table 4: Fetal conditions of study subjects (n = 503), at Dore-bafano Primary Hospital, Sidama, Southern Ethiopia, 2023.

Variables	Frequency	Percent
Lethal congenital anomaly		
No	496	98.6
Yes	7	1.4
5th minute APGAR score		
<1	17	3.4
1-7	80	15.9
≥8	406	80.7
Presence of MSAF		
No	423	84.1
Yes	80	15.9
Birth weight in gram		
<2500	28	5.6
2500-4000	415	82.5
> 4000	60	11.9
Sex of new born		
Male	229	45.5
Female	274	54.5
Perinatal asphyxia		
No	414	82.3
Yes	89	17.7
Any birth trauma		
No	499	99.2
Yes	04	0.8

Magnitude of stillbirth

There were 486 live births and 17 SBs. The overall prevalence of SB in the present cross-sectional study was 3.38% (95% CI: 2%-5.4%) with a SB rate of 33.8/1000 births (Figure 2).

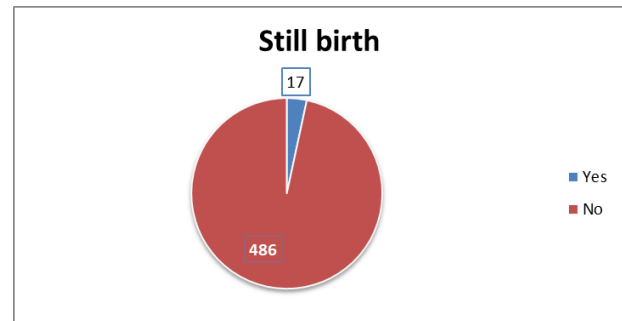


Figure 2. The proportion of SB (n = 503) at Dore-bafano Primary Hospital, Sidama, Southern Ethiopia, 2023.

Factors Associated with Stillbirth

Bivariable binary logistic regression analysis was used to differentiate factors associated with the outcome variable. It was performed for all of the independent variables separately analyzed with the dependent variable. SB was taken as a dependent variable. Based on results maternal age, residence, gestational age less than 37 weeks, antenatal follow up (ANC), malpresentation, obstructed labour, pre-term labour, umbilical cord prolapse, number of gestation, onset of labour, duration of labour greater than 18 hours, congenital anomaly, birth weight, sex of new born and perinatal asphyxia were independent variables found to be statistically significant with p-value < 0.25 and taken as a candidate

for multivariable binary logistic regression analysis with stillbirth.

Multivariable binary logistic regression analysis was performed to identify the independent variables mostly associated with stillbirth after controlling for all possible confounders. Accordingly gestational age < 37 weeks, obstructed labour, duration of labour > 18 hours and congenital anomaly were independent factors associated with SB with p-value <0.05 (Table 5).

The odds of experiencing SB were 97.6% reduced among fetuses who had gestational age \geq 37 weeks when compared to those fetuses who had gestational age <37 weeks

[AOR=0.024; 95% CI: (0.002-0.37)]. On the other hand, mothers who had obstructed labour were 30.26 times more likely to have SB as compared to those women who gave birth free of obstructed labour [AOR= 30.26; 95% CI: (1.14-804.20)] (Table 5). Also, women with duration of labour greater than 18 hours were 17.63 times more likely to give SBs than those mothers who had less than or equal to 18 hours duration of labour [AOR=17.63; 95% CI: (1.23-253.35)]. Whereas, Fetuses who had congenital malformation were 19.78 times more likely to be a SB as compared to normal fetuses [AOR=19.78; 95% CI: (1.33-295.02)].

Table 5: Factors associated with stillbirth at Dore-bafano Primary Hospital.

Variables	Stillbirth		COR (95% CI)	AOR (95%CI)
	No n (%)	Yes n (%)		
Maternal age in years				
<20	66 (93)	5 (7)	1	1
20-34	340 (98.6)	5 (1.4)	0.87 (0.26-2.85)	0.87 (0.26-2.85)
>34	80 (92)	7 (8)	0.17 (0.05-0.54)	0.17 (0.05-0.54)
Residence				
Urban	265 (98.5)	4 (1.5)	1	1
Rural	221 (94.4)	13 (5.6)	3.90 (1.25-12.12)	1.99 (0.34-11.64)
Gestational age				
<37 wks.	52 (82.5)	11 (17.5)	1	1
\geq 37 wks.	434 (98.6)	6 (1.4)	0.06 (0.02-0.18)	0.024 (0.002-0.37)**
ANC				
No	123 (91.1)	12 (8.9)	7.08 (2.45-20.51)	1.01 (0.15-6.55)
Yes	363 (98.6)	5 (104)	1	1
Malpresentation				
No	454 (97.2)	13 (2.8)	1	1
Yes	32 (88.9)	4 (11.1)	4.36 (1.35 14.16)	7.44 (0.43-129.87)
Obstructed labor				
No	477 (97)	15 (3)	1	1
Yes	9 (81.8)	2 (18.2)	7.07 (1.40-	30.26 (1.14-804.20)*

		35.57)			
Preterm labour					
No	445 (96.9)	14 (3.1)	1		1
Yes	41 (93.2)	3 (6.8)	2.32 (0.46-8.47)	0.43 (0.014-13.24)	
Umbilical cord accidents					
No	481 (97.2)	14 (2.8)	1	1	
Yes	5 (62.5)	3 (37.5)	20.61 (4.48-94.90)	2.80 (0.18-43.04)	
Number of gestation					
Singleton	466 (96.9)	15 (3.1)	1		1
Twin	20 (90.9)	2 (9.1)	3.11 (0.67-14.52)	2.11 (0.06-77.99)	
Onset of labor					
Induced	66 (89.2)	8 (10.8)	0.177 (0.066-0.474)	0.90 (0.01-1.14)	
Spontaneous	420 (97.9)	9 (2.1)	1		
Duration of labor in hours					
≤18	416 (97.7)	10 (2.3)	1	1	
>18	65 (90.3)	7 (9.7)	4.48 (1.65-12.19)	17.63 (1.23-253.35)*	
Congenital anomaly					
No	483 (97.4)	13 (2.6)	1	1	
Yes	3 (42.9)	4 (57.1)	49.54 (10.05-244.16)	19.78 (1.33-295.02)*	
Birth weight					
<2500	24 (85.7)	4 (14.3)	4.83 (0.83-28.1)	16.45 (0.29-922.40)	
2500-4000	404 (97.3)	11 (2.7)	0.79 (0.17-3.6)	0.87 (0.09-8.84)	
>4000	58 (96.7)	2 (3.3)	1	1	
Sex of new born					
Male	216 (94.3)	13 (5.7)	0.25 (0.08-0.77)	0.28 (0.03-1.56)	
Female	270 (98.5)	4 (1.5)	1	1	
Perinatal asphyxia					
No	402 (97.1)	12 (2.9)	1	1	
Yes	84 (94.4)	5 (5.6)	1.99 (0.68-5.81)	0.77 (0.11-5.13)	

AOR= Adjusted odds ratio, CI= Confidence interval, COR= Crude odds ratio, 1= Reference, *=p-value < 0.05, **= p-value < 0.01

Discussion

The overall aim of this study was to determine the prevalence and associated factors of SB among women who gave birth at Dore-bafano Primary Hospital, Sidama region, Southern Ethiopia. Accordingly, the prevalence of SB in the present cross-

sectional study was 3.38% (95% CI: 2%-5.4%) (33.8/1000 births) which is higher when compared to the global SB rate estimate 13.9/1,000 births in 2019 (20) and the United Nations (UN) SB rate recommendation rate to be reduced below 12/1,000 births (13, 21), in Latin America, there are an estimated 91 000 SBs each year,

with an estimated rate of 8.2 SBs per 1000 births (95% CI 7.5–9.2) (22), 14.82/1000 in Brazil (23), 0.85% in East Africa (24), 10/1000 in India (25) and in Ethiopia, the world health statistics in 2013 revealed a SB rate of 26/1000 deliveries which is the third highest in the eastern Africa countries (12). This high prevalence of SBs could be attributed to poor quality of health care system, knowledge gap about ANC follow-up, difference in socio-demographic characteristics and poor transport facilities. It is comparable to study done in Tanzania 3.5% (26) and Aksum General Hospital 3.68% (27). This comparability could be due to similar methodological characteristics and socio-demographic characteristics. The prevalence also lower than study conducted in South eastern Nigeria 180/1000 (28), Bahir Dar Felege-hiwot Comprehensive Specialized Hospital 8.7% (29), Harar Hiwot-fana Specialized University hospital 6.7% (30), Wolaita zone 8.7% (31) and Yirgalem Hospital 92/1000 births (32). In this respect, the discrepancy might be due to the fact that the above listed settings are higher facilities which have a high cases flow and where critical cases are referred to from different rural settings which lead to higher number of stillborn babies.

The current study showed gestational age less than 37 weeks was one of the factors that were significantly associated with SB. This

finding was consistent with study conducted in China, a high proportion of SBs occurred at gestational ages of younger than 37 weeks (33), United Kingdom (34), Northern Tanzania (26), Nigeria (35), Aksum General Hospital (27), Hiwot-fana Specialized University Hospital and Jugol Hospital, Harar Ethiopia (16,36). This result might be due to premature newborns had less time to grow in the mother's uterus with minimal lung maturity and they are at risk of being asphyxiated and distressed which leads to stillbirth (16).

In addition, having obstructed labour was strongly associated with stillbirth. This study was in line with Nigeria (35), Hiwot Fana Specialized University Hospital Eastern Ethiopia, Harar (16, 37) and Hawassa University Comprehensive Specialized Hospital (38). The possible explanation could be due to delayed presentation of the mothers at a health facility, poor referral system, delayed diagnosis and poor emergency preparedness and response, resulting in rupture of the uterus which increases SB (37).

On the other hand, prolonged duration of labour was strong factor to have women's experience stillbirth. This finding was supported by study done in Ghana (39), North Shoa zone Oromia region (40), Yirgalem Hospital (32) and Hawassa University Comprehensive Specialized

Hospital (38). The reason behind could be prolonged duration of labour causes asphyxia and fetal distress which causes stillbirth. Moreover, congenital anomaly was more prone to have stillbirth. This study was consistent with studies conducted at North Shoa zone Oromia region (40) and Hawassa University Comprehensive Specialized Hospital (38). This could be due to lack of vital organs for the fetus's survival and fetus's proneness to fatal complications and infections could be the reason for such finding (40). In addition, some of the congenital malformations that are incompatible with life like hydrocephalus might be vaginally delivered by destructive delivery (craniotomy) which literally is killing the fetus in-utero.

Conclusions

In this study, the prevalence of SB was 3.38% (95% CI: 2%-5.4%) (33.8/1000 births), this is higher than a global SB rate of 13.9 SBs per 1,000 total births (20) and national SB rate of 26/1000 deliveries (13). Factors like gestational age less than 37 weeks, obstructed labour, duration of labour greater than 18 hours and congenital malformation were risk factors for SB. Most stillbirth factors in this study were either preventable or manageable by providing appropriate care during the ante-partum and intra-partum periods. Stillbirth factors can be prevented and managed through interventions

focusing on maternal and child health care. Prioritizing early detection and management, implementing quality improvement plans, and monitoring results by regulatory bodies can significantly reduce the high stillbirth rate. Further research is needed to explore potential interventions to mitigate the impact of these risk factors and improve maternal and fetal outcomes.

Authors' contributions

TY was the principal investigator and conceived the study and was involved in the study design, reviewed the article, supervised the data extracting process, analyzed and interpreted the data, report writing and drafted the manuscript. KT supervised the idea and approved the proposal and took part in follow up the principal investigator, oversaw and editing its conduct and analysis, and contributed to the initial and final drafts of the paper. SE, SB, TA, SK, KT participated during proposal writing, supervised the data extracting process and analysis. All authors read and approved the final manuscript.

Funding

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Availability of data and materials

The data supporting this research are available from the authors on reasonable request.

Ethics approval and consent to participate

The Institutional Research Ethics Review Committee (IRERC) provided ethical clearance. The Public Health Institute (PHI) and the Sidama Regional Health Bureau (RHB) are located within Pharma College's Department of Public Health (PC-IRERC-12/14). The Dore-bafano Primary Hospital then received the letter of authorization. After describing the goals of the project and how it can improve obstetric care, the administration office of Dore-bafano Primary Hospital gave permission. Informed voluntarily signed consent was obtained from the hospital's facility head prior to data harvest, and study participants' medical record numbers were used to preserve their privacy.

Consent for Publication

Not applicable

Competing interest

The authors declare no conflict of interest.

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