



ASRAT WOLDEYES HEALTH SCIENCE CAMPUS

SCHOOL OF NURSING AND MIDWIFERY

DEPARTMENT OF PEDIATRICS AND CHILD HEALTH NURSING

**MAGNITUDE OF NEONATAL ASPHYXIA AND ITS ASSOCIATED FACTOR
AMONG NEWBORNS AT PUBLIC HOSPITALS OF WOLAITA ZONE,
SOUTHERN ETHIOPIA, 2023.**

MSC THESIS

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Debre Berhan, Ethiopia

DECLARATION

I declare that magnitude of neonatal asphyxia and its associated factors among newborns in public hospital of Wolaita Sodo Zone Southern, Ethiopia 2023, is my own work and that all the sources that I have used have been indicated and acknowledged by means of reference and that the work has not been submitted before at any other institutions.

Assurance of principal investigator

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of Asrat Woldeyes Health Science Campus.

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ABBREVIATIONS/ACRONYMS

ANC	Antenatal Care
APGAR	Appearance, Pulse Rate, Grimace, Activity, Respiration Rate
APH	Antepartum Hemorrhage Care
DM	Diabetic Mellitus
EDHS	Ethiopian Demographic and Health Survey
GA	Gestational Age
LBW	Low Birth Weight
LMIC	Low- And Middle-Income Countries
MCH	Maternal And Child health
MCHIP	Maternal And Child Health Integration Program
NICU	Neonatal Intensive Care Unit
NMR	Neonatal Mortality Rate
PMR	Perinatal Mortality Rate
PROM	Premature Rupture of membrane
SDG	Sustainable Development Goals
SNNPR	South Nation National of People Region

ABSTRACT

Background: Neonatal asphyxia is a common and preventable cause of infant morbidity and mortality throughout the world, especially in developing nations like Ethiopia. The situation could be improved by early detection and control of the underlying contributing variables. The aim of this research was to evaluate the magnitude and contributing factors of neonatal asphyxia among live newborns at public hospitals in the Wolaita zone of Ethiopia.

Objective: To assess the magnitude of neonatal asphyxia and its associated factor among newborns in selected public Hospitals of Wolaita Zone, Southern Ethiopia, 2023.

Method: A facility-based cross-sectional study was conducted among 330 neonate of mother who gave birth in selected hospitals. A systematic random sampling technique was used to select the study participants. Data were collected through an interviewer-administered questionnaire and checklist. The collected data were entered into EpiData version 4.6 and exported to SPSS version 26 for analysis. Logistic regression was fitted to examine the association between explanatory variables and the neonatal asphyxia. In multivariable logistic regression, AOR with 95% CI was reported, and $p < 0.05$ was used to declare statistically significant variables with the neonatal asphyxia.

Results: The magnitude of neonatal asphyxia was 26.4% with [95% CI: 21.8, 30.9]. Primiparous (AOR = 2.63 95%CI 1.47, 4.72), low-birth-weight (AOR = 3.45 95%CI 1.33, 8.91), preterm birth (AOR = 3.58 95%CI 1.29, 9.92), and premature rupture of membranes (AOR = 5.19 95%CI 2.03, 13.26) were significantly associated with neonatal asphyxia.

Conclusions and recommendations: Based on the finding of this study the magnitude of neonatal asphyxia was quite high. Among the factors like, parity, birth weight of the newborn, premature rupture of the membrane, and gestational age at birth were significantly associated with neonatal asphyxia. Focus should be given to early detecting and preventing the occurrence of neonatal asphyxia from the complications during pregnancy and during Labour and delivery.

Key words: Neonatal asphyxia, Newborns, Associated factors, Ethiopia

1. INTRODUCTION

1.1. Background

Newborns asphyxia can occur in utero, during labor, and after delivery as a result of an impaired placental gas exchange. It is a main clinical problem that happens all round and considerably will increase neonatal mortality and morbidity. It is a condition that affects a fetus or newborn and results in decreased oxygen perfusion to various organs (1). Birth asphyxia is caused by prenatal, fetal, and intranatal causes. The highest proportional risk (70%) for birth asphyxia is associated with intra-natal related, followed by antenatal (20%) and fetal (10%) factors(2).

Globally, most of the neonatal mortality (75%) happens within the first week of the neonatal period & About 1 million newborns die within the first 24 hours. According to the 2016 UNICEF report Preterm birth, infections, and birth asphyxia are the top cause of neonatal deaths(3). According to World health organization statistic in developing country every year 120 million infants born this 3% develop birth asphyxia, and 900,000 of them die. Also, perinatal asphyxia is to fault for 23% of newborn deaths in low-income countries, with sub-Saharan Africa accounting for 38% of these deaths (4-7).

Most cases of birth asphyxia are caused by disruptions in placental blood flow, which also affect fetal circulation. The placental vasculature may be impacted by maternal diseases like diabetes mellitus, hypertension, and pre-eclampsia, which can result in less blood flow. Fetal circulation is impacted by the effects of maternal hypotension caused on by medications, illnesses, and anesthesia. Birth asphyxia is also related to factors that lower placental blood flow, such as placenta abruption and antepartum hemorrhage(2). Birth. The APGAR score table is used to detect whether a baby has asphyxia. A score of 0, 1, or 2 is assigned to each of the five components of the score: appearance (color), heart rate, grimaces (reflexes), activity (muscle tone), and breathing(8).

The diagnosis of birth asphyxia is made when a newborn's Apgar score is less than seven. Scores between zero and three indicate severe birth asphyxia, while those between four and seven indicate moderate birth asphyxia(9).

Apgar scores, the onset of spontaneous respiration, the need for chest compressions, the need for endotracheal intubation, oxygen saturation, and the length of hospital stay were all important outcomes that were taken into account. The main clinical manifestation of neonatal asphyxia is caused by a combination of hypoxia and ischemia of the brain, because asphyxia cases are more often associated with antepartum factors and intrapartum insults (10). This result permanent neurological complications like epilepsy, cerebral palsy, or developmental delays could affect the survivors who are still alive.

One of the nations with the highest rates of neonatal mortality worldwide is Ethiopia. According to a comprehensive review of state-of-the-state asphyxia statistics, the incidence of asphyxia is 18 % in East Africa and 22.52% in Ethiopia (11). Additionally, the 2019 Ethiopian Mini Demographic Health Surveillance (EDHS) report found that the neonatal mortality rate has slightly increased from 29 deaths per 1,000 live births in the 2016 EDHS report to 30 in 2019 (12). 9.6 deaths were recorded for every 1,000 live births, with birth asphyxia accounting for 13.5% of neonatal mortality cases (13).

If maternity and child health services in developing countries like Ethiopia offer mothers specialized care throughout their pregnancies, during labour, and after delivery, they may be able to prevent infant deaths. The prevention of birth asphyxia, reduction of mortality, and improvement of infant quality of life all depend on early identification and management of the causes of the condition. This study has the potential to present evidence of neonatal asphyxia and quantify neonatal asphyxia in newborns birth at three public hospitals in the Wolaita Zone of southern Ethiopia as well as the contributing factors.

1.2. Statement of problem

Globally, as reported in 2018, there were 2.5 million neonatal deaths in their first month of life, or about 7000 newborn deaths per day, with approximately one-third occurring on the day of birth and nearly three-quarters occurring within the first week of life. One of the main causes of neonatal mortality and morbidity worldwide, particularly during the first week of life in low- and middle-income countries (LMIC), is still birth asphyxia(14).

About 29% of early neonatal deaths and 23.3% of all neonatal deaths are caused by birth asphyxia. Neonatal deaths worldwide each year, Sub-Saharan African nations contributed to over 1.1 million of these deaths. In the case of Uganda's maternal and perinatal death surveillance and response report for 2020–2021, birth asphyxia was responsible for 48% of all perinatal deaths. Children who die within 28 day of life suffer from conditions and diseases associated with lack of adequate and quality care at birth and immediate treatment after birth (15-17).

In developing countries, particularly, neonatal asphyxia continues to be a serious clinical problem. Because of four million babies are born each year with asphyxia, a significant number. An estimated 1 million neonatal deaths result from moderate-to-severe asphyxia, which affects 3.6 million infants in developing countries, according to a WHO statistical report, 840,000 (83% of the total) of these infants die(18). According to various statistics, Africa accounts for more than 25% of newborn deaths worldwide. The four African children who die include one newborn (19).

The difference between developed and developing countries is still significant, as evidenced by the low NMRs and quicker reductions in developed countries, despite the fact that some regions of developed countries worldwide have made good progress in the past ten years in reducing neonatal mortality due to birth asphyxia. However, there hasn't been an apparent decrease in NMRs in developing nations as a result of birth asphyxia, particularly in sub-Saharan Africa (20). There is a very high risk of birth asphyxia in sub-Saharan Africa, where in the first day of life, birth asphyxia results in 280,000 newborn deaths. According to recent reports, prenatal asphyxia is the third leading cause of death in children under the age of five. This finding demonstrates that birth asphyxia continues to be a global problem (21). Ethiopia

is one of the nations with the highest NMR in the world, with 29 deaths per 1000 live ,births (22).

The prevalence of birth asphyxia in Ethiopia: according to various studies, the magnitude of perinatal asphyxia was Worabe 41.2% (23),In Jimma 47.5% (24).and same study in the southern Ethiopia, Gamo Gofa zones show that neonatal mortality incidence ratio was 9.6 deaths per 1,000 live births among which 13.5% of neonatal mortality cases were due to birth asphyxia in 2019 (13). Multiple risk factors have been identified by numerous international studies, including socio demographic (mother's age, place of residence, marital status, level of education, and occupation), antepartum (ANC follow-up, parity, history of previous neonatal death, pre-eclampsia), intrapartum (prolonged labor, amniotic fluid status, cephalopelvic disproportion, mode of delivery), and neonatal(sex, birth weight, gestational age are associated with neonatal asphyxia) (25).

Prenatal asphyxia is a significant cause of morbidity and mortality in Ethiopia, where it is exacerbated by a number of issues, such as low antenatal coverage (30% in Ethiopia), home deliveries, difficult access to healthcare facilities, a lack of qualified health workers, management faults (immediate treatment after birth) and inadequate transportation services (26).Continuous training is necessary to meet these challenges, and this training requirement eventually include referring, transporting, and giving teams. Despite numerous initiatives to stop and decrease perinatal asphyxia, its prevalence seems to be rising over time. Assessing the severity of the condition and identifying risk factors are important steps in reducing neonatal asphyxia. Hence, this prospective cross section study was carried out to assess the magnitude of perinatal asphyxia in social context (social settings) and primary hospitals, in Wolaita Zone

1.3. Significances of study

The finding of this study provides pertinent information for different planning and intervention programs of hospitals, and health bureaus in the study setting to minimize the neonatal morbidity and mortality related to neonatal asphyxia.

In addition to this, the finding is also used as a reference for health care providers, especially for obstetric and neonatal care providers working in maternity wards and neonatal intensive care units to educate mothers about the early identification of the risks of neonatal asphyxia during pregnancy, labor and delivery, and after child birth.

It is also used as a source of information for other researchers, who want to conduct further research on the neonatal asphyxia and related topics.

2. LITERATURE REVIEW

2.1. Magnitude of Neonatal Asphyxia

According to the finding of study conducted in southern India, the magnitude of birth asphyxia was 2.7% (27), and in a study done in Iran it was founded to be 58.8% (61). According to the study conducted in Bangladesh, prenatal asphyxia affects 56.9% of newborns, and 35% of newborns die from it (28). Another study conducted in South East Nigerian revealed that 12.81% of the newborns were affected by perinatal asphyxia (29).

A cross-sectional study conducted in Kenya's hospitals show that the prevalence rate of neonatal asphyxia was 5.1% (30). A related review from Ghana reveals that 283 of the 468 term newborns admitted there had asphyxia (31). A cross-sectional study conducted in referral hospitals of Northern Uganda revealed that the magnitude of birth asphyxia (Apgar score less than at fifth minutes) was (5.3%), 476 out of 2928 newborns had an Apgar score less than seven at one minute. One in ten newborns who suffered from birth asphyxia had Apgar scores of less than or equal to three at five minutes(17).

According to a studies done in different areas of Ethiopia, the magnitude of neonatal asphyxia was 27.1% in public hospitals of North Gondar Zone, Northwest Ethiopia (38), 22.6% in northeast Amhara, Ethiopia (58), 22.1% in Tigray (40) and 28.35% in Debre Tabor General Hospital, North Central Ethiopia (59).

According to similar studies done in Dilla Referral Hospital in Southern Ethiopia the magnitude of neonatal asphyxia was founded to be 32.8% (41), in Jimma zone public hospitals, Southwest Ethiopia it was found to be 47.5% (60) and in another study conducted in the Public Health Facilities of Bahir Dar City, Northwest Ethiopia the magnitude of neonatal asphyxia was founded to be 21.7% (62), in a study conducted in Ayder Comprehensive Specialized Hospital, Northern Ethiopia 18% of the newborns were asphyxiated (63) and in a study conducted in Harari and Dire Dawa Public Hospitals, eastern Ethiopia 20.8% (64).

2.2. Factor Associated with Neonatal Asphyxia.

2.2.1. Maternal socio demographic characteristics

Study from Colombia hospital of University identify that maternal age, rural and education were risk factors for the development of neonatal asphyxia(32). In Uganda, young mothers <19 years of age were twice as likely to give birth to newborns with asphyxia (17). A cross-sectional study done at the labor ward and new-born unit of the Naivasha district hospital of Kenya shows that educational level, employment status, and the age of the mother have no significant association (33).

According to the findings of a study conducted in Dire Dewa East Ethiopia on the prevalence and associated factors of perinatal asphyxia, a mother aged between 15-20 years and 26-30 years was four times more likely to develop birth asphyxia (34). Finding of a study in Tigray, Ethiopia shows that maternal illiteracy was a significant sociodemographic risk factor of asphyxia with an odds ratio of 6 compared to those with higher education level (35).

2.2.2. Antepartum Risk Factors

Studies done in India and Nepal revealed that Primigravida was significantly associate factor for birth asphyxia (36). A study from a sub-urban hospital in Cameroon states 39.5% of the mothers whose babies were asphyxiated did not receive any form of ANC, and hypertension which occur during pregnancy were common antenatal risk factor (31). Another study conducted in Tigray, North Ethiopia, and shows ANC (Antenatal care) follow-up of 3.67%, maternal anemia of 7.11%, and maternal anemia 7.11%, preeclampsia 4.68%. were an antenatal risk factor for prenatal asphyxia (37). The study revealed that, with odds of 3 and 12, respectively, primiparity and APH were both strongly linked with birth asphyxia in Tigray.(35). According to a cross-sectional study conducted in Jimma, newborns whose mothers had no ANC follow-up were six times more likely than those whose mothers had an entire ANC visit to experience birth asphyxia. Additionally, moms who received insufficient ANC visits had a 4.58 percent chance of giving birth to a baby who had suffocated(38). A study in Fiji, Island, maternal preeclampsia was more than five times the risk for newborns to have a LAS among women with GDM(39).

A study conducted in North Gondar Zone, Northwest Ethiopia indicated that 90.2% had attended antenatal care public hospitals, (54.9%) moms had four or more antenatal care visits.

23.2% of all respondents were women. Obstetric complications during pregnancy. systematic review examining the prevalence and associated factors of perinatal asphyxia in Dilla notes that neonates delivered from mothers who had anemia during pregnancy, neonates from mothers who had meconium containing amniotic fluid, and chronic hypertension, were significantly associated factors with perinatal asphyxia among newborns (40).

2.2.3. Intrapartum risk factors

In Pakistan's military hospital in Multan, a cross-sectional study found that spontaneous vertex delivery, prolonged second stage of labor and spontaneous vertex delivery, cesarean section, instrumental delivery; premature rupture of membranes and meconium staining, amniotic fluid were intrapartum determinant factor of prenatal asphyxia(41).

In addition, a retrospective study, conducted at the NICU of the civil hospital in Karachi shows that neonates delivered at home and in private clinics were more susceptible to the risk of developing neonatal asphyxia than those to deliver at the hospital. Breech presentation of the fetus, cephalopelvic disproportion (obstructed labor), premature rupture of membrane, and prolonged labor were significantly associated with perinatal asphyxia (26). At the neonatal intensive care unit (NICU) of the Kathmandu Medical College teaching hospital of Nepal, a descriptive cross-sectional study was conducted on newborns with perinatal asphyxia over six months period shows that prolonged and obstructed labor were common associated factor of prenatal asphyxia(42).

A study in Colombia identified that, labor with a prolonged expulsive Phase, neonates who were delivered by caesarean section and neonates borne other health institution were associated factors for the development of prenatal asphyxia in the study participant (32). Study from Dire Dawa east Ethiopia shows mode of delivery had significant association with birth asphyxia. Vacuum had high risk for neonatal asphyxia when compared to other form of delivery. Also duration of labor was statistically significant factors of birth asphyxia (34). South Central Ethiopia A retrospective cross-sectional study premature rupture of the membrane was significantly associated with perinatal asphyxia(23). A cross-sectional study conducted in the town of Arba Minch revealed that mothers who were augmented or induced

during labor and had meconium-stained amniotic fluid were more than three times as likely to have babies with low fifth-minute APGAR scores(43).

2.2.4. Neonatal/ Fetal factor

According to a cross-sectional study in Tehran-Iran LBW and preterm birth neonates had been 3 times more to have birth asphyxia than term neonates (44). A cohort study in the southeastern region of Sweden; conclude that a low fifth-minute APGAR score is associated with premature birth and post-term birth(45).

A study conducted in maternity hospital of Bangalore state that neonates whose birth weight between 1–2 kg Study from Tanzania indicates female of a baby was significantly associated with delivery of low birth weight infants. Moreover, in turn, low birth weight infants had increased risk of Apgar score of less than 7 at fifth minute. On the other hand low birth weight increase risk of being delivered preterm PROM also other associated factor (46).

Expert reviews suggested that the short-term consequences of IUGR involve metabolic and hematological disturbances along with disrupted thermoregulation consequently leading to morbidities like respiratory distress syndrome (RDS)(47).

A review on clinical profile and outcome of prenatal asphyxia in India describe that gender of the neonates, 42 (70%) were found to be males and 18 (30%) were females, Small for gestational age and Post maturity were risk factor for neonatal asphyxia (48). In a study of Lahore, Pakistan, term newborns had a male to female ratio of 2:6 in newborns with asphyxia. (36).

Study from Tigray east Ethiopia shows, prolonged labor, meconium stained amniotic fluid and neonatal weight had a significant with neonatal asphyxia the study further indicated that neonates born with cesarean section are seven times more affected by perinatal asphyxia than neonates born through vagina(49).

3. CONCEPTUAL FRAMEWORK

Before developing this conceptual framework for factors associated with neonatal asphyxia, the principal investigator reviewed much previous relevant literature on the topic of neonatal asphyxia (perinatal asphyxia) and its associated factors. The arrows in the diagram shows the relationship between the different independant variables with outcome variable.

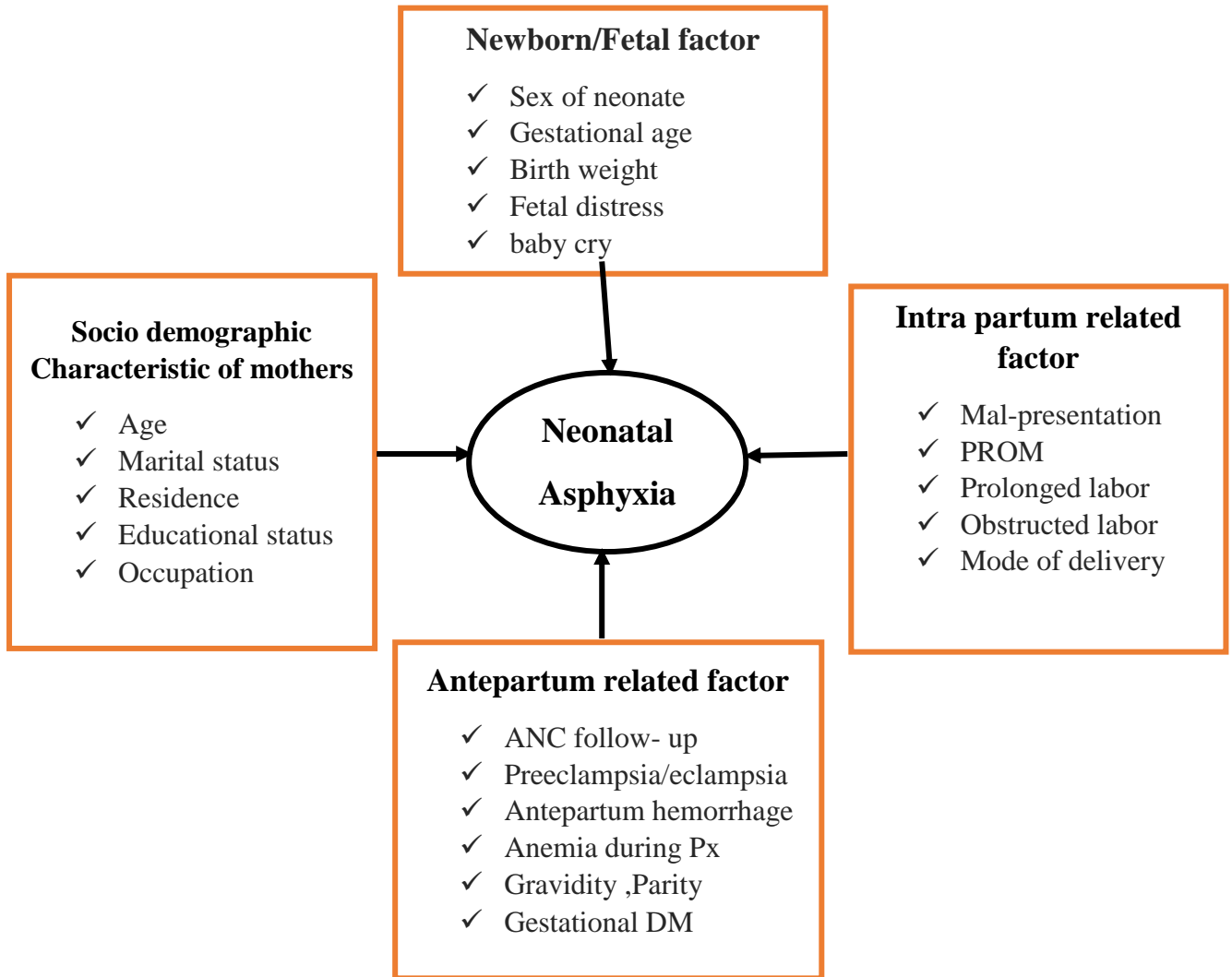


Figure1. Conceptual framework of factors associated with neonatal asphyxia (25, 37, 40, 50).

4. OBJECTIVE

4.1. General objective

- To assess magnitude of neonatal asphyxia and its associated factors among newborns at the public hospital in Wolaita Zone, Southern Ethiopia, in 2023.

4.2. Specific objectives

- To determine magnitude neonatal asphyxia among newborns at the selected Hospital in Wolaita Zone, Southern Ethiopia, 2023.
- To identify associated factors of neonatal asphyxia among newborn selected Hospital in Wolaita Zone, South Ethiopia, 2023.

5. METHODS AND MATERIAL

5.1. Study area and period

This study was conducted in Wolaita Zone in Southern Ethiopia from May 1 to June 1, 2023, in a public hospital. Which is located 394 km away from Addis Ababa, the capital city of Ethiopia, in the southern direction, and is also 134 km far from Hawassa, the capital of the south nation nationality of people in the regional state. Wolaita Zone is bordered by Gamo Gofa South, Omo River West, and Dawro Northwest. It has a total population of 5,385,282 (males: 2687021; females: 2698261). The total population of the study area is 419,198. This study was conducted in selected public hospitals (Gesuba primary hospital, Bitena primary hospital, and Humbo primary hospital).The primary health coverage of Wolaita Zone is provided according to the zonal health department report 8 hospitals, out of this 6 Governmental and 2 private hospitals; 69 health centers, and 24 private medium clinics, 342 health posts and 1419 health worker, That provide basic health services, including normal delivery services and basic obstetrical care and management of complicated deliveries, caesarian sections, and maternal and child health services.

5.2. Study design

A facility based cross- sectional study was conducted.

5.3. Populations

5.3.1. Source populations

All live birth neonates who delivered at gestational age of ≥ 28 weeks in public hospital, Wolaita Zone Southern region, Ethiopia 2023.

5.3.2. Study populations

All live birth neonates who delivered at gestational age ≥ 28 weeks in selected public hospital, Wolaita zone southern region, Ethiopia, 2023.

5.4. Eligibility Criteria

5.4.1. Inclusion Criteria

All live birth neonates who delivered at a gestational age of ≥ 28 weeks 'during data collection period.

5.4.2. Exclusion Criteria

Unknown gestational age and gross congenital anomalies that were incompatible with life (such as anencephalic and hydrocephalic) were excluded.

5.5. Sample size Determination

Sample size for the first specific objective:

The sample size for the first specific objective was calculated by using a single population proportion formula with the following assumptions, the marginal error (d) = 5%, confidence level = 95% ($Z_{\alpha/2} = \pm 1.96$), and the proportion of neonatal asphyxia (p) was 27.1%, from a previous study conducted in South Gondar zone in Ethiopia (51)

$$n = \frac{(Z_{\alpha/2})^2 p(1-p)}{d^2}$$

$$n = \frac{(1.96)^2 0.271(1-0.271)}{(0.05)^2}$$

$$= 303.6 \approx 304$$

By considering a 10% non-response rate the final sample size was 335.

$$= 304 + (304)10/100$$

$$= 304 + 30.4 = 334.4 = \underline{\underline{335}}$$

Where:

n = Sample size

d = Marginal error = 5%

$Z_{\alpha/2}$ = Standard normal distribution value at 95% confidence level = ± 1.96

P = The proportion of neonatal asphyxia (p) was 27.1%, from a previous study conducted in South Gondar zone in Ethiopia (51)

Sample size for the second specific objective: was determined by double population formula considering the significantly associated with neonatal asphyxia in previous studies and calculated final sample size using Epi Info statistical software version 7.2.5 using 95% CI level, power 80%, ration 1:1.

Table 1: Sample size determination for the second objective

S/no	Variables	Percept in unexposed (%)	Power	Reported AOR	Ratio	Sample size	Calculated sample plus 10% Non-response rate	Reference
1	Neonates born to rural mothers	27.1	80%	2.41	1:1	198	218	(51)
2	Low birth weight (< 2.5kg)	16.4	80%	3.706	1:1	112	123	(51)
3	Mothers aged ≥ 35	15.1	80%	6.4	1:1	58	64	(52)

Finally, the required sample size for this study was decided by taking the larger sample size, the sample size calculated for the first specific objective was larger (335).

5.6. Sampling Procedure

Among six public hospitals in Wolaita zone, three hospitals were selected using lottery method. The sample size for each hospital proportionally allocated, based on the monthly average number of deliveries, Humbo Primary Hospital 255, Gasuba Primary Hospital 165, Bitena Primary Hospital 215, The total monthly delivery is found to be 635, by proportional allocation formula; $n = n_f \times n_i / N$ for Humbo primary hospital=135, Gesuba primary hospital 87 and Bitena primary hospital 113. The study participants were selected with systematic random sampling method. To determine the sampling interval K value, by dividing the average monthly deliveries in each hospital for proportional allocated sample size ($k=N/n$). then study participant was selected ever k^{th} value. The first study participant was selected, where by first and second neonate of mothers coded 1 and 2 picked a folded piece of paper.

Table 2: List and average number of deliveries in Wolaita Zone of Southern Ethiopia.

S/no	Name of Hospital	Average Number of Delivery/month
1	Wolaita Sodo Teaching Hospital	315
2	Humbo Primary Hospital	255
3	Boditi Primary Hospital	95
4	Gesuba Primary Hospital	165
5	Bitena Primary Hospital	215
6	Bombe Primary Hospital	84

Then the number of study units to be sampled from each hospital was determined using proportional to size allocation formula; $n_f \times n_i / N$. Where: n_f = final sample of the study n_i = number of neonates in each selected hospital N =total number of neonates in selected hospital: Gesuba primary hospital $335 \times 165 / 635 = 87$, Humbo primary hospital $335 \times 255 / 635 = 135$, and Bitena primary Hospital $335 \times 215 / 635 = 113$

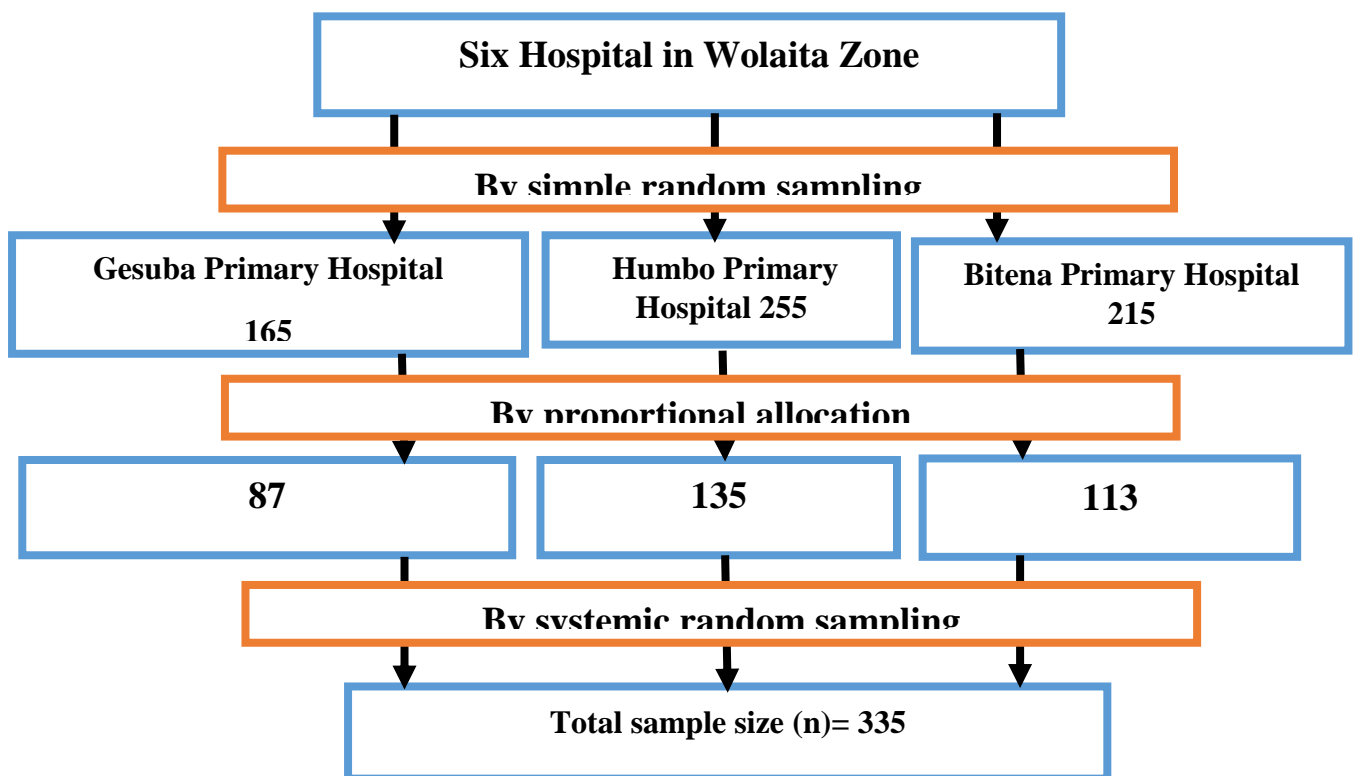


Figure 2: Neonatal Asphyxia among live births at public hospitals of Wolaita zone southern Ethiopia, 2023.

5.7. Study Variable

5.7.1. Dependent variable

- Neonatal asphyxia

5.7.2. Independent variables

Socio demographic variables:

- ✓ Age
- ✓ Marital status
- ✓ Educational status
- ✓ Place of residency, and occupation.

Antepartum related factor

- ✓ Anemia during Pregnancy
- ✓ ANC follow up
- ✓ Gestational Diabetes mellitus
- ✓ Preeclampsia/eclampsia
- ✓ Antepartum hemorrhage
- ✓ Gravidity, and Parity

Intra partum related factor

- ✓ Premature rapture of membrane
- ✓ Prolonged labor
- ✓ Obstructed labor, and Mode of delivery.

Neonatal related factor

- ✓ Birth weight
- ✓ Fetal distress
- ✓ Gestational age and Gender of neonate
- ✓ baby cry

5.8. Data collection tools and procedures

An interviewer-based, semi-structured questionnaire was used to collect the data, along with a checklist for reviewing the medical records. The tools used to collect the data were adapted from previous relevant literature (31, 34, 37, 40). The questionnaire was prepared in English and translated to Amharic in local context by language experts before an actual data collection period to reduce the language barrier.

The actual data collection was carried out from May 1 to June 1, 2023, by six trained BSc midwives to record the data and three senior BSc nurses to supervise the data quality. The data collection tools have four main parts: Maternal related factors, age, marital status, residence and occupational status), antepartum (parity, antepartum hemorrhage, obstetric and medical diseases, and antenatal visits), intra partum (duration of labor, fetal presentation membranes rupture status), and neonatal related factors (asphyxia, gestational age, birth weight, sex, and birth type) were abstracted using a pre-tested structured questionnaire from the mothers who gave birth during the data collection period.

5.9. Data Quality Control Assurance

The questionnaire was prepared in English, then translated into Amharic, and retranslated back to English to check the consistencies. Pre-test was done on 17 live newborns (5%) of the sample size taken from Boditi Primary Hospital before an actual data collection period to ensure the questionnaire was clear, error-free, and complete. Based on the results of the pretest, adjustments were made as needed, and the amended tool was used for an actual data collection. Six BSc midwifery professionals and three BSc nursing professional supervisors were trained for one day, and assigned to three hospitals where they collect the data. During the data collection period, close supervision and monitoring was carried out by supervisors and investigator to ensure the quality of the data. Daily evaluation of the data for completeness and encountered difficulties at the time of data collection was addressed accordingly. Finally, all the collected data were checked by the supervisor and investigator for its completeness, consistency, and clarity during the data management.

5.10. Data processing and Analysis

The collected data were cleaned, coded, and entered into EpiData version 4.6 software. Then, the data were exported to SPSS version 26 for analysis. Descriptive analysis was used to describe the characteristics of participants, and the result was described in the form of text, tables, and figures. By using a binary logistic regression model, bivariable analysis was done

to identify the relationship between each independent variable and the outcome variable. Independent variables with $p < 0.25$ were included in the multivariable analysis to exclude potential confounders and identify actual associations. Multi-collinearity was checked to see the linear correlation among the independent variables by using the variance inflation factor and tolerance test. None of the variables yield variance inflation factor >10 and tolerance test < 0.1 . The model fitness was checked by the Hosmer Lemeshow goodness of fit test, it was found to be insignificant ($p = 0.143$), which indicates that the model was fitted. Then, in the multivariable logistic regression analysis, adjusted odds ratio (AOR) with a 95% confidence interval (CI) was reported, and variables with $p < 0.05$ were declared to be significantly associated with neonatal asphyxia.

5.11. Ethical Consideration

Ethical clearance was obtained from Debre Berhan University Asrat Woldeyes Health Science Campus, from institutional review board (protocol number: IRB-131), after reviewing for the absence of any harm to study participants. A cooperation letter was written to public hospitals in the study area from the Asrat Woldeyes Health Science Campus. Before starting the data collection, the Medical Directorates of each public hospital in the study setting provided their written and signed permission. Before participating in the study, each participant was informed of its goal and potential benefits. After explaining the study, informed voluntary written and signed consent was obtained from each participant who agrees to participate in the study before starting the data collection. The study participants were informed about their rights to refuse participation, ask any question or withdraw at any particular time during the data collection process without being frustrated.

5.12. Operational Definitions

Neonatal asphyxia: a newborn was considered to have neonatal asphyxia when at birth with an APGAR score was less than seven at fifth minute (53, 54).

Prolonged first stage of labor : means more than the normal range of labour time (55).

Preeclampsia is defined as the sudden onset of increasing blood presser during pregnancy (56)

Obstructed labor: considered when the presenting part of the fetus could not progress into the birth canal, despite strong uterine contractions (57).

Premature rupture of membranes: rupture of the membrane of the amniotic sac occurred before the onset of labor (58).

Maternal anemia: hemoglobin (Hg) level < 11 gm/dl during the current pregnancy (59)

5.13. Dissemination of Study Result

The final finding of this study will be presented in public during thesis defense and the hard copies of the finding will be submitted to Debre Berhan University, Asrat Woldeyes health science campus library. The finding of the research will also be disseminated to health facilities in the study area and other concerned bodies at different managerial levels to enable them to consider recommendations during their planning of different locally appropriate policies. Depending on the opportunities, the finding will be presented in conferences and published in reputable journals for worldwide dissemination.

6. RESULTS

6.1. Socio-demographic characteristics of the participants

In this study a total of 330 mothers with newborn were participated, with a response rate of 98.5%. The mean age of the respondents was 25.94 years with a standard deviation of ± 5.25 years. Of these, 122(37%) of mothers were found in the age group of 20 to 24 years and 152(46.1%) were urban dwellers. Regarding current marital status and occupation, 304(92.1%) were married and 207(62.7%) of respondents were housewives respectively. Two hundred two (61.2%) of study participants completed secondary school or above.

Table 3: Socio-demographic characteristics of study participants at public hospitals in Wolaita Zone southern Ethiopia 2023 (n = 330)

Variable	Response	Frequency (n)	Percent (%)
Age	≤19	27	8.2
	20 – 24	122	37
	25 – 29	103	31.2
	30 – 34	44	13.3
	35 and above	34	10.3
Marital status	Single	9	2.7
	Married	304	92.1
	Divorced	9	2.7
	Widowed	8	2.4
Occupation	Government employee	38	11.5
	Private	35	10.6
	Merchant	34	10.3
	Housewife	207	62.7
	Student	16	4.8
Residence	Urban	152	46.1
	Rural	178	53.9
Educational status	No formal education	6	1.8
	Primary school	86	26.1
	Secondary school	202	61.2
	Higher education	36	10.9

6.2. Antenatal Related Factors

In this study, 320(97%) of the respondents had attended antenatal care follow up in the current pregnancy, even though, 84(25.5%) of them had less than four ANC visits. 209(63.3%) of respondents were multiparous and about 30(9.1%) of mothers were anemic and 13(3.9%) have a preeclampsia/eclampsia. 10(3%) of mothers have antepartum hemorrhage and 3(0.9%) of respondents have gestational diabetes mellitus (**Table 4**).

Table 4: Antenatal Related Factors among the Participants at public hospitals in Wolaita Zone southern Ethiopia 2023 (n = 330)

Variables	Response	Frequency (n)	Percent (%)
Parity	Primipara	121	36.7
	Multipara	209	63.3
Have ANC follow-up	Yes	320	97
	No	10	3
Number of ANC visits	< 4 visits	84	25.5
	≥ 4 visits	246	74.5
Gravida	Primigravida	87	26.4
	Multigravida	243	73.6
Have anemia	Yes	30	9.1
	No	300	90.9
Preeclampsia/eclampsia	Yes	13	9.3
	No	317	96.1
APH	Yes	10	3
	No	320	97
Gestational DM	Yes	3	0.9
	No	327	99.1

APH: antepartum hemorrhage, **DM:** Diabetes mellitus, **ANC:** Antenatal care visits

6.3. Intrapartum related factors

In this study, 271(82.1%) of mothers were gave birth by spontaneous vaginal delivery, and 43(13%) of mothers had a prolonged labor, 294(89.1%) of newborn were delivered by vertex presentation, and 24(7.3%) of mothers were diagnosed for Premature rapture of membranes and only 6(1.8%) of mothers have an obstructed Labour (**Table 5**).

Table 5: Intrapartum Related Factors among the Participants in Wolaita Zone southern Ethiopia 2023 (n = 330)

Variables	Response	Frequency (n)	Percent (%)
Mode of delivery	Spontaneous vaginal	271	82.1
	Cesarean section	54	16.4
	Instrumental	5	1.5
Prolonged first stage of Labour	Yes	43	13
	No	287	87
Presentation of the fetus	Cephalic	294	89.1
	Non-cephalic	36	10.9
Diagnosed for PROM	Yes	24	7.3
	No	306	92.7
Obstructed labor	Yes	6	1.8
	No	324	98.2

PROM: Premature rapture of membranes.

6.4. Newborn Related factors

Among the newborns included in this study, 173(52.4%) were female in sex and 262(79.4%) of newborns have a normal birth weight, 270 (81.8%) of respondents gave birth at a term gestational age, while 73(22.1%) of newborns have a fetal distress during delivery,264(80) of newborn were crying during delivery and .

Table 6: Newborn related factors among live birth who delivered at public hospitals of Wolaita Zone southern Ethiopia 2023 (n = 330)

Variables	Response	Frequency (n)	Percent (%)
Sex of the newborn	Male	153	46.4
	Female	173	52.4
Birth Weight	Low birth weight (< 2500g)	44	13.3
	Normal (2500 to 4000g)	262	79.4
	Macrosomia (> 4000g)	24	7.3
Gestational age at birth	Preterm (≥ 28 to <37weeks)	36	10.9
	Term(37-42weeks)	270	81.8
	Post-term(>42weeks)	24	7.3
Fetal distress	Yes	73	22.1
	No	257	77.9
Did the baby cry	Yes	264	80
	No	66	20

Kg: Kilograms

6.5. Magnitude of Neonatal Asphyxia

The magnitude of neonatal asphyxia among live births at public hospitals of Wolaita zone in southern Ethiopia was found to be 26.4% with [95% CI: 21.8, 30.9] based on APGAR scoring less than seven at fifth minutes after birth.

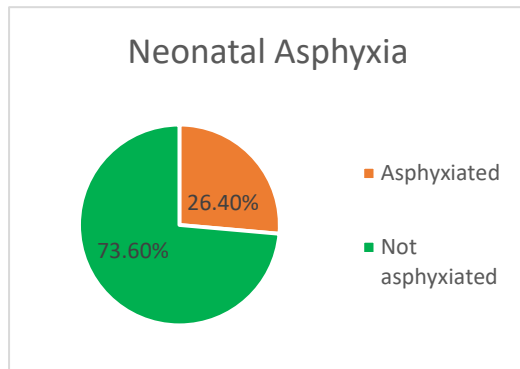


Figure 3: Neonatal Asphyxia among live births at public hospitals of Wolaita zone southern Ethiopia, 2023.

6.6. Factors associated with Neonatal Asphyxia

In the bivariable logistic regression analysis, place of residence, parity, birth weight of the newborn, premature rupture of the membrane, gestational age at birth, maternal anemia, and sex of the newborns were identified as a candidate variable for multivariable analysis.

However, on the multivariable logistic regression analysis, four variables (parity, birth weight of the newborn, premature rupture of the membrane, and gestational age at birth) were significantly associated with neonatal asphyxia at 95% confidence level with $p < 0.05$.

The odds of neonatal asphyxia were 2.63 times higher among neonates born to Primiparous mothers than neonates born to multiparous mothers (AOR = 2.63 95%CI 1.47, 4.72).

The odds of neonatal asphyxia were 3.45 times higher among low-birth-weight neonates than neonates with a normal birth weight (AOR = 3.45 95%CI 1.33, 8.91).

Furthermore, the odds of neonatal asphyxia were 3.58 times higher among preterm neonates than neonates delivered at a term gestational age (AOR = 3.58 95%CI 1.29, 9.92). In addition, neonates born to mothers with premature rupture of membranes were 5.19 times more likely

to asphyxiated at birth as compared to those neonates born to mothers with no premature rupture of membranes (AOR = 5.19 95%CI 2.03, 13.26).

Table 7: Factors associated with neonatal asphyxia among live births at public hospitals of Wolaita zone southern Ethiopia, 2023 (n = 330).

Variables	Neonatal Asphyxia		COR(95%CI)	AOR(95%CI)	p-value
	Yes (n =87)	No (n = 243)			
Place of residence					
Urban	25	127	1.00	1.00	
Rural	62	116	2.71(1.60, 4.60)	1.59(0.86, 2.94)	0.139
Parity					
Primiparous	50	71	3.27(1.97, 5.43)	2.63(1.47, 4.72)*	0.001
Multiparous	37	172	1.00	1.00	
Birth weight of the newborn					
< 2.5 kg	27	17	6.90(3.49, 13.65)	3.45(1.33, 8.91)*	0.011
2.5-4kg	49	213	1.00	1.0	
> 4 kg	11	13	3.67(0.68, 5.13)	1.33(0.38, 4.67)	
Sex of the newborn					
Male	49	105	1.69(1.03, 2.77)	0.95(0.51, 1.74)	0.867
Female	38	138	1.00	1.00	
Gestational age at birth					
Preterm	24	12	8.38(3.93, 17.85)	3.58(1.29, 9.92)*	0.014
Term	52	218	1.00	1.00	
Post-term	11	13	2.36(0.81, 6.82)	1.46(0.40, 5.30)	0.558
Premature rupture of the membrane					
Yes	14	10	4.46(1.90, 10.48)	5.19(2.03, 13.26)*	0.001
No	73	233	1.00		
Maternal anemia					
Yes	18	12	5.02(2.30, 10.93)	1.09(0.36, 3.24)	0.875
No	69	231	1.00	1.00	

AOR: Adjusted odds ratio, COR: crude odds ratio, CI: Confidence interval, *shows significance.

7. DISCUSSION

This study aimed to determine the magnitude of neonatal asphyxia and its associated factors among newborns at the public hospital in Wolaita Zone, Southern Ethiopia. The finding revealed that, the magnitude of neonatal asphyxia in this study setting was 26.4%. Among the factors like, parity, birth weight of the newborn, premature rupture of the membrane, and gestational age at birth were significantly associated with neonatal asphyxia.

The magnitude of neonatal asphyxia in this study setting was consistent with the finding of studies conducted in public hospitals of North Gondar Zone, Northwest Ethiopia (27.1%) (51), northeast Amhara, Ethiopia (22.6%) (60), in Tigray (22.1%) (37) and in Debre Tabor General Hospital, North Central Ethiopia (28.35%) (61).

However, this finding was lower than the result of studies done in Dilla Referral Hospital in Southern Ethiopia (32.8%) (40), Jimma zone public hospitals, Southwest Ethiopia (47.5%) (38) and in Iran (58.8%) (44). This variation might be due to differences in sample size, study setting, and most crucially, case definition, since the Iranian study employed additional laboratory-based results as diagnostic criteria for newborn asphyxia whereas our study only used the fifth minute APGAR score less than seven.

While, this study finding was higher than the results of other studies in the Public Health Facilities of Bahir Dar City, Northwest Ethiopia (21.7%) (62), Ayder Comprehensive Specialized Hospital, Northern Ethiopia (18%) (63) and in Harari and Dire Dawa Public Hospitals, eastern Ethiopia (20.8%) (64). This discrepancy might be due to differences in sociodemographic characteristics among the study participants.

In this study, the odds of neonatal asphyxia were 2.63 times higher among neonates born to Primiparous mothers than neonates born to multiparous mothers. This finding is consistent with the result of studies conducted in Pakistan, Nigeria, and central Tigray(49, 65). This consistency might be due to the fact that primipara mothers are more likely to give birth at a younger age, may be more prone for malpresentation, prolonged obstructed labor, and the mother who is going through labor and delivery for the first time may take longer to negotiate with the pelvic brim and may fail to progress in labor, resulting in the delivery of an asphyxiated neonate.

The odds of neonatal asphyxia were 3.45 times higher among low-birth-weight neonates than neonates with a normal birth weight. These finding was supported by the results of studies conducted in Jimma zone southwest Ethiopia (66), North Gondar Zone, Northwest Ethiopia (51), General hospitals in Gondar (66) and Iran (67). This similarity might be due to the reason that many little babies are born preterm, where they lack enough surfactant and have breathing problems, and that neonates with low birth weights frequently have pulmonary immaturity and inadequate respiratory muscle strength (68).

Furthermore, the odds of neonatal asphyxia were 3.58 times higher among preterm neonates than neonates delivered at a term gestational age. This finding was in line with a study conducted in Debre Markos Comprehensive Specialized Referral Hospital, Northwest Ethiopia(69), Ilu Aba Bor zone southwest, Ethiopia (70) and Bahir Dar City, Northwest Ethiopia (62). The possible reason may be related to side effects of preterm delivery, such as respiratory distress syndrome, which is brought on by immature lungs that are unable to maintain adequate oxygenation, leading to hypoxia, which damages the nervous system and results in conditions like cerebral palsy and necrotizing enterocolitis (71).

In addition, neonates born to mothers with premature rupture of membranes were 5.19 times more likely to asphyxiated at birth as compared to those neonates born to mothers with no premature rupture of membranes. This finding was consistent with the result of studies conducted in public hospitals of North Gondar Zone, Northwest Ethiopia (51), Mulago Hospital, Uganda (72), Saudi Arabia (73) and Urban Health Facility in Cameroon (47). The possible reason might be due to oligohydramnios, the presenting part of the fetus presses on the umbilical cord and causes umbilical cord compression, and blood flow that carries maternal oxygen to the baby is obstructed, causes asphyxia (74).

8. Conclusions

Based on the finding of this study the magnitude of neonatal asphyxia was quite high when compared to other researches done on neonatal asphyxia. The finding also identified that among the factors like, parity, birth weight of the newborn, premature rapture of the membrane, and gestational age at birth were significantly associated with neonatal asphyxia.

9. Recommendations

Based on the findings of this study, the following recommendations were given:

To Health Professionals

- Health professionals who are working at ANC service would have better to increase their attention and their advice for the mother regarding the prevention and signs of premature rapture of the membrane, and the necessity of immediate treatment to prevent birth asphyxia and other complications.
- Health care personnel, particularly during labor and delivery, must pay more attention to risk for birth asphyxia (parity, birth weight of the newborn, premature rapture of the membrane, and gestational age at birth) strict follow-up and be ready for neonatal resuscitation.
- The health professionals would have to increase the monitoring of fetal heart rate and make an early decision while the fetus is in distress and they should provide follow up during labor, delivery and newborn care for the fetus at risk of preterm birth and low birth weight.

For the Ministry of health and Zonal Health Bureau

- The government should improve the priority given to birth asphyxia by improving awareness of the medical, psychosocial and economic burden of birth asphyxia. Primary care organizations would better to increase their support towards antenatal care service, maternal education program and improve routine fetal heart rate counting.
- The zonal health bureau should set up extra training services in neonatal asphyxia care and prevention process.

- They should to assist health professionals especially obstetric care providers by giving them knowledge and training in health care service.
 - It is preferable to plan and deliver the tools and materials required for health professionals to advance their training on management of neonatal asphyxia.

To Researchers

- To address every problem that this study falls to address and additional follow up studies need to be conducted.

10. Limitation of the study

During data collecting, recall bias could be developed. Only the government facility was used to conduct this investigation. Private hospital and health center not included.

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12.ANNEXES

12.1. Annex I. Information sheet for participants

Good morning? / Good afternoon? My name is ----- I am Deber Berhan university Asrat Woldeyes health Campus second year master degree pediatric nurse student a data collector. I am going to ask you some questions about your history of pregnancy before you deliver the current child. The information we get from you helps as to recommend to the concerned body about the improvement of Antenatal, Delivery and Postpartum service. You were selected to participate in this study just by chance. The following are some general information about the study.

The objective of the study: The aim of this study will be to assess the magnitude of neonatal asphyxia and its associated factor among new-born public hospital Wolaita zone from May 1, 2023 to June 1, 2023.

The benefit of the study: there is no direct short term benefit for participants. However, it may use the policymakers to evaluate the service and help them to improve newborn and maternal health services.

Risk of the study: this study has no risk for participant.

Right of the participants: the participation is based on your voluntarism and you are not obligated to answer any question you do not wish to answer. This interview will take about 25-35 minutes. If you feel discomfort with the interview, please feel free to withdraw from the interview at any time.

Confidentiality: your name will not be written in this form and will never be used in connection with any information you tell us. All information given by you will be kept strictly confidential.

Person to contact: This research project will be reviewed and approved by the institutional review board of College of Health Science, school of nursing and midwifery, Deber Berhan

University. Aserate Woldeyes Health Campuses. If you have any question you can contact any of the following individuals (Investigator and Advisors) and you may ask at any the time you want.

Principal investigator: Name Shewazerf Gizachew Deber Berhan University Aserate Woldeyes Health Campuses, school of Nursing and midwifery. Cell phone: - 0985338514, E-mail:

12.2. Annex-II English Version Questionnaire

Magnitude of neonatal asphyxia and its associated factor among new-born selected public hospital Wolaita zone southern Ethiopia.A cross-sectional Study

Identification related information

Data collector's Name: _____ Signature: _____
Date _____

Supervisor's Name: _____
Signature _____

Questionnaire Code No: _____ Hospital Name _____

Annex: Data collection

Data will be collected from neonate May 1 to June 30/2023 accordingly. This questioner is adopted and modified from literatures I used (31, 34, 37, 40). This questioner will have used for each neonate.

Code of neonate: _____/_____

Part I - Socio demographic characteristics of the mother

Code	Variable	Category	Remark
101	Age of the mother	_____	
103	What is your marital status?	1. Single 2. Married 3. Divorced 4. Widowed	
102	Educational status	1.No formal education 2.Primary 3.Secondary 4.Higher education	
103	Where is your residence?	1. Urban 2. Rural	
104	Occupation	1.House wife 2.Private 3.Government 4. Merchant 5. Student 6. Other_____	

Part II: Antenatal related factor

Code	Variable	Category	
201	Parity	_____ number	
202	Gravidity	_____ in number	
203	Did you visit health facility for ANC during your pregnancy for this neonate?	Yes No	If 'no' skip to 206
205	If Yes how many times did you receive antenatal care during your time of pregnancy for this neonate?	_____ times	
206	Did the mother suffer from any of these Complication/illnesses during pregnancy		
	Anemia	1.yes 2.No	
	Preeclampsia/eclampsia	1.yes 2.no	
	APH	1.yes 2.no	
	Gestational DM	1.yes 2.no	
	Other specific	_____	

Part III: Intra partum related factor

Code	Variable	Category	
301	Mode of delivery	1. SVD 2. C/S 3. Instrumental	
302	Prolonged first stage of labor	1.Yes 2.No	If 'no' skip to 304
303	If yes for q 302, Duration prolonged first stage of labor	_____hrs.	
304	What was presentation of the fetus	1.Vertex 2.Non-Vertex	
	Did the mother diagnose any of the following during labor		
305	Diagnosed for PROM	1.Yes 2.No	
306	Obstructed labor	1.Yes 2.No	

Part IV Neonatal related factor

Code	Variable	Category	
401	Sex of new born	1. male 2 .female	

402	Birth weight	1.<2.5kg 2. 2.5kg-4kg 3. >4kg	
403	Gestational age at birth (GA)	1.>=28 to <37wk 2.37wk-42wk 3.>42 wk	
404	Did the baby cry	1.yes 2.no	

Checklist from the medical records

001	Hemoglobin count for the current pregnancy?	_____gm/dl
002	Fetal distress during labor	1.Yes 2.no
003	APGAR score at five minutes	1.<7 2. >=7

12.3. Annex III: Training module for data collectors and supervisors

I. Instruction

Procedures to be followed during extract data from the mother.

When to collect data/safe time.

When to start data collection and when to end (total period).

II. Methods of training

Pass through the instrument or data collection tool with data collectors to point out specific instructions. Provide an example of a completed instrument for the data collectors. Allow data collectors to practice with the tool.

Table: training module manual

Data collection method Or instruction	Data collector	Training needs	Training activities
Chart and neonates of mother	BSc	observation and distribution technique How to follow and feel the instrument	Observation instruction How to collect data Trainer observation practice

12.4. Appendix IV: ለአራስ እናት መረጃ ወረቀት የስምምነት ቅጽ

እንደምን አረፈድክ? ስሜ ----- የደብረ ብርሃን ዩኒቨርሲቲ ነኝ አስራት ወልደየስ ጤና ካምፓስ ሁለተኛ ዓመት ሁለተኛ ዲግሪ የሕፃናት ነርስ ተማሪ መረጃ ሰብሳቢ። የአሁኑን ልጅ ከመውለዳችሁ በፊት ስለ እርግዝና ታሪክዎ እና በወሊድ ወቅት ስለሚከሰት የጨቅላ ህጻናት መታፈን አጋላጭ ሁኔታዎችን ለመለየት በማጥናት ላይ ነኝ። አንዳንድ ጥያቄዎችን ልጠይቅዎት ነው።

ከተስማሙ ወደ ጥያቄው ካልተስማሙ _____ ወደ ሌላ ተሳታፊ

ከእርስዎ የምናገኘው መረጃ ስለ ቅድመ ወሊድ፣ የወሊድ እና የድህረ ወሊድ አገልግሎት መሻሻል ለሚመለከተው አካል ለመምከር ይረዳል። በዚህ ጥናት ላይ ለመሳተፍ የተመረጡት በአጋጣሚ ነው። ስለ ጥናቱ አንዳንድ አጠቃላይ መረጃዎች የሚከተሉት ናቸው።

የጥናቱ አላማ፡ የዚህ ጥናት አላማ አዲስ በሚወለዱ ህዝባዊ ሆስፒታል ወላይታ ዞን መካከል ያለው የአራስ አስፈክሲያ/ መታፈን መጠን እና ተያያዥነት ያለው ምክንያት ከግንቦት 1 ቀን 2023 እስከ ሰኔ 1 ቀን 2023 ድረስ ያለውን ሁኔታ ለመገምገም ይሆናል።

የጥናቱ ጥቅም፡ ለተሳታፊዎች ቀጥተኛ የአጭር ጊዜ ጥቅም የለም። አዲስ የተወለዱ እና የእናቶች ጤና አገልግሎትን ለማሻሻል እንዲረዱ ሊጠቀም ይችላል።

የጥናቱ ስጋት፡ ይህ ጥናት ለተሳታፊ ምንም አይነት ስጋት የለውም።

የተሳታፊዎች መብት፡ ተሳትፎው በእርስዎ ፍቃደኝነት ላይ የተመሰረተ ነው እና እርስዎ ለመመለስ የማይፈልጉትን ማንኛውንም ጥያቄ ለመመለስ አይገደዱም። ይህ ቃለ መጠይቅ ከ25-35 ደቂቃ

ይወስዳል። በቃለ መጠይቁ ላይ ምቹት ከተሰማዎት፣ እባክዎን በማንኛውም ጊዜ ከቃለ መጠይቁ ለመውጣት ነፃነት ይሰማዎ።

ምስጢራዊነት፡ ስምዎ በዚህ ቅጽ አይጻፍም እና እርስዎ ከሚነግሩን ማንኛውም መረጃ ጋር በተያያዘ በጭራሽ ጥቅም ላይ አይውሉም። ሆኖም በእርስዎ የተሰጡ መረጃዎች በጥብቅ ሚስጥራዊ ይሆናሉ የአራስ አስፈክሲያ መጠን እና ተያያዥነት ያለው ምክንያት በወላይታ ዘን በደቡብ ኢትዮጵያ በተመረጠ የህዝብ ሆስፒታል ውስጥ።

የዋናው መርማሪ አድራሻ፡

ስም ፡- ሸዋዘርፍ ግዛቸውን

ሞቢል፡- 0985338514

የመረጃ ሰጪ ፊርማ _____ ቀን _____

የተጀመረበት ሰዓት _____ ያለቀበት ሰዓት _____

የጠያቂው ስም _____ ፊርማ _____ ቀን _____

የተቆጣጣሪ፤ስም _____ ፊርማ _____ ቀን _____

የመጠይቁ ውጤት

1. ሙሉ በሙሉ የተሞላ
2. ያልተስማሙ
3. በከፊል የተሞላ

12.5. Appendix V: ማጠቃለያ - አሚኒስትሬሽን

ይህ ማጠቃለያ የተዘጋጀው ወላይታ ዞን መካከል ሆስፒታል አዲስ በሚወለዱ ጨቅላ ህጻናት መታፈን መጠን እና ተያያዥነት ያለው ምክንያት ከግንቦት 1 ቀን 2023 እስከ ሰኔ 1 ቀን 2023 ድረስ ያለውን ሁኔታ ለመገምገም ይሆናል።

የአራስ ሕፃን ኮድ:- _____/_____ አድራሻ፣ ቀበሌ _____ የተቋሙ ስም _____

ክፍል አንድ:- የ ማህበራዊ እና ኢኮኖሚያዊ ጥያቄዎች

ተ.ቁ	ጥያቄ	መልስ	ይዘለሉ
101	እድሜዎ ስንት ነው?	_____ ዓመት	
102	የጋብቻ ሁኔታ?	1. ያላገባች 2. ያገባች 3. ባሏ የሞተባት 4. ባሏን የፈታች	
103	የትመህርት ደረጃዎ ስንት ነው?	1. ያልተማረች 2. የመጀመሪያ ደረጃ 3. ሁለተኛ ደረጃ የተማረች 4. ኮሌጅና ከዛ በላይ	

104	የርስዎ የስራ ሁኔታዎን ድነው?	<ol style="list-style-type: none"> 1. የቤት እመቤት 2. የመንግስት ሰራተኛ 3. በግል ተቋም 4. ነጋዴ 5. ተማሪ 	
105	የመኖሪያ ቦታዎ የት ነው?	<ol style="list-style-type: none"> 1. ከተማ 2. ገጠር 	

ክፍል ሁለት፤ ክፍያው ወሊድ ጋር የተያያዙ አጋላጭ ሁኔታዎች

ተ.ቁ	ጥያቄ	መልስ	ይዘለሉ
201	ስንተኛ እርግዝና ስን ወ?	_____ (በቁጥር)	
202	ስንተኛ ልጆች አሉሽ?	_____ (በቁጥር)	
203	የቅድመ ወሊድ ክትትል አግኝተዋል?	1. አዎ 2. አላገኘሁም	መልስዎ አላገኘሁም ከ ሆነ ወደ ቁ 205 ይለፉ
204	ስንት ጊዜ የቅድመ ወሊድ ክትትል አግኝተዋል?	_____ (በቁጥር)	
205	በእርግዝና ወቅት ከሚከተሉት ሁኔታዎች ውስጥ በህክምና የተረጋገጠ ያጋጠመዎት ችግር አለ?		
206	የደም ማነስ	1. አዎ 2. አልነበረም	
	በእርግዝና ወቅት የደም ገፊት መጨመር	1. አዎ 2. አልነበረም	
	በእርግዝና ወቅት የደም መፍሰስ	1. አዎ 2. አልነበረም	
	በእርግዝና ወቅት የተከሰተ የስኩዋር በሽታ	1. አዎ 2. አልነበረም	

ክፍል ሶስት፡ ከዎሊድ ጋር ተያያዥዎ ሆኑ ጥያቄዎች

ተ.ቁ	ጥያቄ	መልስ	
301	የ ወሊድ ሁነታ	1. በማህጸን 2. በአጥፊነት 3. በመሳሪያ እርዳታ	
302	የተራዘመ የመጀመሪያ ምጥ ነበር?	1. አዎ 2. አልነበረም	
303	የተራዘ ምጥ ስንት ሰዓት ነበር?	_____ ሰዓት	
304	ምጡ የጀመረ በት ሁኔታ	1. በ ራሱ ጊዜ 2. በ ምጥጣኝ ጀመሪያ	
305	ፅንሱ ሲወለድ አቀራረብ ምን ነበር?	1. በጭንቅላት 2. ከጭንቅላት ዉጭ	
306	እናትዎ በወሊድ ጊዜ ከሚከተሉ ውስጥ አንዱን መርምሯል?		
307	ከምጥ በፊት የእንሸርት ዉሃ ፍሰስ ነበር?	1. አዎ 2. አልነበረም	መልስዎ አልነበረም ከሆነ ወደ ቁ. 309 ይለፉ
308	መልስዎ አዎ ከሆነ ከምጥ በፊት የእንሸርት ዉሃ ከፈሰሰ ስንት ሰዓት	_____ ሰዓት	

	ቆየ ?		
309	ምጥ ቆየቶ ነበር?	1. አዎ 2. አልነበረም	

ክፍል አራት የ ጨቅላ ህጻን የ ሚመለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄ	ይዘለሉ	ይዘለሉ
401	የልጅዎ ጾታ ምንድን ነው?	1. ወንድ 2. ሴት	
402	ሲወለድልጅዎ ክብደት ምን ያህል ነው?	1. <2000ግ 2. 2500ግ-4 000ግ 3. > 4000ግ	
403	በወሊድ ጊዜ የፅንሰ መታፈን	1. አዎ 2. አልነበረም	
404	የማህፀን ውስጥ በቁጣጥ የተበላሽ ፈሳሽ መለቀቅ ነበር ?	1. አዎ 2. አልነበረም	
405	በወሊድ ጊዜ ህፃኑ አለቀሰ ነበር ?	1. አዎ 2. አልነበረም	