# Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia

**Daniel Shiferaw[1]* and Sileshi Toma[2]**

[1]Department of Nursing, College Health Science, Mizan-Tepi University, Mizan-Teferi, Ethiopia
[2]Midwife Advisor, UNICEF Project Implemented by Ethiopian Midwife Association, Addis Abeba, Ethiopia

***Corresponding Author:*** Daniel Shiferaw, Department of Nursing, College Health Science, Mizan-Tepi University, Mizan-Teferi, Ethiopia.

## Abstract

**Introduction:** Obstructed labour is still a major cause of maternal morbidity and mortality and of adverse outcome for women and newborns in developing countries. The problem is caused by maternal pelvis or the fetus or both.

**Methods:** A retrospective cross-sectional study was carried out to assess the magnitude and associated factors of obstructed labour, and its fetal and maternal outcome among women delivered in Gimbi public hospital of Western Ethiopia. The study was conducted from February to March 2015. A total of 321 delivery registrations from 2012 - 2014 were reviewed. Single population proportion formula was used to determine sample size. The study participants were selected by systematic sampling technique. Bivariable and multivariable logistic regression analysis were applied. Independent variables with p < 0.05 in multivariable logistic regression analysis were considered as predictors of obstructed labour.

**Results:** Prevalence of obstructed labour was 18.1% and the main causes were cephalo pelvic disproportion 61.3% followed by mal-presentation 27.1%. Risk of Obstructed labour was significantly associated with age, 15 - 19 year (AOR 11.22, 95% CI: 4.43 - 28.42); parity (nulipara) (AOR 24.96, 95% CI: 10.73 - 56.85) and birth weight of 2.5 - 4 kg (AOR 4.76, 95% CI: 1.20 - 18.90). The major maternal complications were post-partum hemorrhage, ruptured uterus, and puerperal sepsis. Out of total obstructed deliveries, 45 (78.9%) of them were live birth and 13 (21.1%) were still birth. Poor perinatal outcome including perinatal mortality was higher among obstructed deliveries. Prenatal complication was related with parity, and prolonged duration of labour. Perinatal mortality rate was 310 per 1000 total births for women who had obstructed labour and 42 per 1000 total births among women non-obstructed group. Overall the perinatal mortality rate was 90 per 1000 total births.

**Conclusion:** The prevalence of obstructed labour was high. Age of the mother, parity and birth weight were significantly associated with obstructed labour.

***Keywords:*** *Delivery; Mothers; Obstructed Labour; Outcome*

## Introduction

Globally, at least 500, 000 women die each year from complications of pregnancy and child birth. More than 70% of all maternal deaths are due to five major complications: hemorrhage, infection, unsafe abortion, hypertensive disorders of pregnancy, and obstructed labor [1].

**Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia**

283

Obstructed labour is the failure of the fetus to descend through the birth canal; it is generally a second stage phenomenon, in parturient women when labour is prolonged due to one of the 'Ps' (as midwives and obstetricians call them): 'passenger(fetus)' and 'passage(pelvis)' or both [1].

Worldwide maternal mortality and morbidity due to obstructed labour has not significantly changed over the last 30 years and the figure still stands at 3 - 6% [3]. Developing countries are still contributing 99% of all maternal mortality globally and the adult lifetime risk of maternal death (the probability that a 15 year old female will eventually die from labour related complications) is highest in Sub-Saharan Africa (SSA) that is, 1 in 31 [4]. In the region 23 countries have made none or insufficient progress in their attempt for achievement of Millennium Development Goal 5 (MDG 5) which aims at 75% reduction in maternal mortality by 2015 [4]. Six nations together, among which Ethiopia, contribute more than half to the total global maternal mortality of around 350,000 to 500,000 women worldwide in 2007/2008 [2].

Systematic review conducted on eighteen health facility based maternal mortality studies between 1980 and 2012 in Ethiopia showed that the top four causes of maternal mortality were abortion related complications (31%), obstructed labor/uterine rupture (29%), sepsis/infection (21%) and hemorrhage (12%). The same study also revealed that, the top four causes of maternal mortality were obstructed labor (36%), hemorrhage (22%), and sepsis/infection (13%) [5].

Recent studies done in Asia showed that prevalence of obstructed labour was 1.64% - 5.2% [6-8]. Where as in SSA including Ethiopia, the prevalence of obstructed labour is higher with ranges from 3.3 - 12.2% [9-13]. Prevalent in the rural area particularly among younger age and primigravida [6-9], women who are in labour at home for a long time [9] and did not have antenatal care follow up [7,9,12,13] and low educational status [7,8].

Different study findings showed that the commonest cause of obstructed labour was cephalo-pelvic disproportion (47.5 - 66%) followed by fetal malposition and malpresentation (24.8 - 36.4%) [7-10,12] and also hydrocephalus, fetal congenital abnormality were identified. The commonest mode of delivery among mothers with obstructed labour was caesarean section, which ranges from 46.1 - 88% [6-9] and followed by craniotomy in 16.2%, instrumental delivery in 14.1%, hysterectomy in 14.6% and repair of ruptured uterus in 18.9% [9].

Complication resulting from obstructed labour to the mother and the fetus is worse when neglected or intervention is delayed. Fistula [6], postpartum haemorrhage [5-7], shock, paralytic ileus, sepsis/infection [5-7,12], urinary tract infection [7], uterine rupture [5,7,12] and death to the mother [6-10] as well as neonatal sepsis [7], birth trauma to the face or the presenting parts, severe asphyxia [7], jaundice and neonatal death [6-9] among its consequences[11]. Incidence of PPH, still birth, perinatal mortality, and cesarean section was significantly higher among multiparas [7].

Studies done in Asian countries such as Bangladesh, India and Pakistan showed that maternal mortality related to obstructed labour ranges 1 - 1.94% [6,8] and while perinatal mortality rate among women with obstructed labour were 22.68% - 54.6% [6-8]. In SSA countries such as Uganda, Kenya and Ethiopia studies revealed that perinatal mortality rate of total births in women with obstructed labour was 142/1000, 108/1000 and 66.1/1000 respectively [10,12,13]. Perinatal mortality related to obstructed labour ranges 3.3% - 1.94% [6,8] and while perinatal mortality among obstructed labour was 55.5% [12].

Obstructed labour is a totally preventable labour complication. The prevention of obstructed labour can be promoted by: managing labour and delivery by skilled manpower, using the partograph, birth preparedness and complication readiness, nutritional education, delaying early marriage [1,9].

In the study area, health facilities are lacking in number and many are of substandard quality with low utilization rates, and high case fatality rates among pregnant women who manage to access health care facilities. Women mostly deliver their babies at home and many

**Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia**

284

of the occurring maternal deaths are avoidable with large impact on child health and development. The majority of the population is composed of subsistence farmers, with per capita income below the international poverty line of $1 USD per day [20].

However, so far there was no data on prevalence of obstructed labour and its outcome at study area. Thus the findings of this study provides the prevalence; risk factors and outcome of obstructed labour at study area and could form the basis for further research, recommendation for prevention, management practice for governmental and non-governmental organization who works on improvements maternal health.

## Materials and Methods

### Study design and population

A retrospective cross-sectional study was carried out in Gimbi public hospital from February to March 2015. The hospital MCH department run by 8 midwives 3 clinical nurses and one OGY-Gynecologist and approximately about 2000 deliveries were attended annually. A total of 321 deliveries registered on books from 2012 - 2014 were reviewed and according to the registration, within the three years period 7,190 mothers were admitted for labour and delivery. The study participants were selected by systematic sampling technique using delivery registration books as frame and every 22 registered mothers were selected. Single population proportion formula was used to determine sample size based on prevalence of obstructed which is 12.2% taken from the study done at Jimma University specialized hospital [12]. Women who gave birth at home or another health institution and admitted for post-partum complication and incomplete records were excluded.

### Data collection instrument and procedures

Four midwives were recruited from other hospital for data collection. Structured check list adapted after review of relevant literatures and modified to the local situation was used for data collection. The check list was pre tested on 5% of the sample size in the other public hospital before the actual data collection. Data were collected through record review using structured format by trained data collectors. The data were collected under close supervision of the supervisors to ensure adherence to correct data collection procedures. Supervisors and investigators reviewed the filled check lists at the end of data collection every day for completeness.

### Study variables

**Outcome variables:** Obstructed labour.

### Independent variable

- Socio demographic factors such as age, marital status, residence, income, educational status, distance.
- Obstetric and GYN factors such as parity of the mother, gestational age, number of ANC visits, contracted pelvis, myoma.
- Fetal factors such as malpresentation, fetal malformation, fetal weigh, number of fetus/es.
- Maternal complication/out comes such as puerperal sepsis, PPH, ruptured uterus, wound infection, UTI, abdominal distension and maternal death.
- Newborn complication/out comes such as asphyxia, sepsis, neonatal jaundice and fetal/neonatal death.

### Data analysis procedures

The data was checked for completeness, consistency and entered in to Epidata version 3.1 statistical packages and exported to SPSS version 20.0. In addition to descriptive statistics, Bivariate analysis was checked and variables having association (p value 0.25) were entered in to multivariable logistic regression was carried out to assess association between obstructed labour and different explanatory variables. The strength of association was interpreted using odds ratio and confidence interval. P value < 0.05 was considered statistically significant in this study. Finally the result was presented using statements and tables.

**Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia**

285

## Operational and term definitions

- **Obstructed labour***:* Is the failure of the fetus to descend through the birth canal, because there is a barrier (obstruction) preventing its descent despite strong uterine contractions which are usually occurs at the pelvic brim, but occasionally it may occur in the pelvic cavity or at the outlet of the pelvis. When labour is prolonged because of failure to progress, there is a high risk that the descent of the fetus will become obstructed.

- **Contracted pelvis**: With normal fetal weight when the pelvis is not enough to allow the fetus to pass through.

- **Complications of obstructed labour***:* For the purpose of this study, complications of this nature include rupture of uterus, PPH, sepsis, wound infection, abdominal distention and the later maternal death, as well as sepsis, jaundice and asphyxia and still birth and death for the baby.

- **Mode of delivery:** In this study, mode of delivery indicated the manner by which the fetus is delivered. The mode of delivery can be assisted vaginal delivery, caesarean section, destructive or instrumental.

- **Prevalence of Obstructed Labour:** Is the ratio of obstructed labour occurrences to the total number of mothers who delivered in a given time period.

- **Apgar score:** This is an assessment of the newborn condition right after birth, at 1, and 5 minutes, by evaluating the 5 indicators: colour, heart rate, Grimace (response to stimuli), Activity (Tone) and Respiration (breathing rate).

- **Asphyxia:** A condition in which insufficient or no oxygen and carbon dioxide are exchanged on a ventilator basis or APGAR less than 7 at 1st and 5th minutes.

- **Sepsis:** The presence of pus-forming bacteria or their toxins in the blood or tissues.

- **Neonatal jaundice:** Yellowing of the skin and the whites of the eyes caused by an accumulation of bile pigment (bilirubin) in the blood.

- **Still birth:** Birth of a baby that has already died in the womb.

- **Neonatal death:** Death of the newborn in the first month of life.

- **Perinatal death**: Still birth and early newborn death.

- **Normal duration of labour**: labour accomplished within 24 hours.

- **Prolonged labour**: duration of labour greater than 24 hours.

## Ethical Consideration

Before the data collection, Ethical clearance and Cooperation letter was written from Jimma University, and then submitted to Gimbi public hospital administration for permission. The health workers particularly those who were working in the labour and delivery ward were informed about the purpose of the study, and their cooperation was obtained. The data from the registration book and patient confidential was maintained by making each check list coded and not sharing personal information of any patient to the third party.

## Result

### Socio demographic characteristics of the mothers

All 321 documents are reviewed. From the total, 60 (18.7%) and 118 (36.8%) of the mothers were in the age group of 15 - 19 years and 20 - 24 years respectively. Majority of the mothers 306 (95.4%) were married. 201 (62.2%) of the women were from rural dwellers (Table 1).

| Variable | Frequency (No) | Percentage (%) |
|---|---|---|
| **Age (in years)** | | |
| 15 - 19 | 60 | 18.7 |
| 20 - 24 | 118 | 36.8 |
| 25 - 29 | 97 | 30.2 |
| 39 -34 | 28 | 8.7 |
| >= 35 | 18 | 5.6 |
| **Marital status** | | |
| Married | 306 | 95.4 |
| Single | 10 | 3.1 |
| Others[1] | 5 | 1.5 |
| **Residence** | | |
| Rural | 201 | 62.6 |
| Urban | 120 | 37.4 |

*Table 1: Sociodemographic characteristics of mothers who delivered at Gimbi public hospital, 2015.*
[1]*: Others are widowed and divorced.*

**Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia**

286

### Obstetric conditions of the mothers

Among selected cases, 36 (11.2%) had no ANC visits and 7 women have no information regarding their visit. For all women attended the selected hospital 212 (66%) underwent spontaneous vaginal delivery followed by 105 (32.7%) caesarian section (CS). For mothers who under gone CS, 58 (55.2%) because of obstructed labour and 29 (27.6%) for fetal distress. The study also showed the main cause of obstruction was cephalo pelvic disproportion which accounts 36 (62.1%) followed by malpresentation 16 (27.1%) and others such as hydrocephalous, twins and myoma accounts 6 (10.3%).

Regarding the birth weight of the new born; most of them, 280 (87.2%), were 2.5 to 4 kg. Among all deliveries conducted, 14 (4.4%) PPH, 6 (1.9%) sepsis, 4 (1.2%) ruptured uterus and 297 (92.5%) were live births, 19 (5.9%) were stillbirth and 5 (1.6%) were IUFD. Neonatal complication such as asphyxia 88 (27.4%), 7.4% neonatal death and 0.3% jaundice were observed (Table 2).

| Variable | Frequency (No) | Percentage (%) |
|---|---|---|
| **Parity** | | |
| 0 | 116 | 36.2 |
| 1 | 182 | 56.7 |
| 2 - 4 | 19 | 5.9 |
| ≥ 5 | 4 | 1.2 |
| **ANC visits** | | |
| 0 | 36 | 11.2 |
| 1 | 51 | 15.9 |
| 2 | 78 | 24.3 |
| 3 | 80 | 24.9 |
| 4 | 69 | 21.5 |
| No information | 7 | 2.2 |
| **Duration of labour** | | |
| 12 - 24 hrs | 261 | 81.3 |
| > 24 hrs | 60 | 18.7 |
| **Mode of delivery** | | |
| SVD | 212 | 66.0 |
| CS | 105 | 32.7 |
| Others[1] | 4 | 1.2 |
| **Reason for CS** | | |
| OL | 58 | 55.2 |
| Fetal distress | 29 | 27.6 |
| Maternal exhaustion | 9 | 8.6 |
| Others[2] | 9 | 8.6 |

**Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia**

287

| Cause of OL | | |
|---|---|---|
| CPD | 36 | 62.1 |
| Malpresentation | 16 | 27.6 |
| Other[s]3 | 6 | 10.3 |
| **Fetal condition at birth** | | |
| Live birth | 297 | 92.5 |
| IUFD | 5 | 1.6 |
| Still birth | 19 | 5.9 |
| **APGAR score (1st Min)** | | |
| < 7 | 171 | 57.6 |
| >= 7 | 126 | 42.4 |
| **Number of babies** | | |
| Singleton | 315 | 98.4 |
| Twins | 6 | 1.9 |
| **Baby weight (in Kg)** | | |
| < 2.5 | 22 | 7.5 |
| 2.5 - 4 | 260 | 87.5 |
| >4 | 15 | 5.0 |
| **Maternal and New born complications** | | |
| Asphyxia | 88 | 27.4 |
| Neonatal jaundice | 1 | .3 |
| Neonatal death | 1 | .3 |
| Asphyxia and death | 13 | 4.0 |
| PPH | 14 | 4.4 |
| Ruptured uterus | 6 | 1.9 |
| Sepsis | 4 | 1.2 |

*Table 2: Obstetric conditions of mothers who delivered at Gimbi public hospital, 2015.*
*[1]Others: Destructive, Instrumental.*
*[2]Others: Failed induction, Ruptured uterus, APH.*
*[3] Others: Hydrocephalous, twins and myoma*

**Maternal and Fetal outcome among mothers with obstructed labour**

Out of 321 reviewed records 58 (18.1%) of mothers developed obstructed labour. Among the Obstructed deliveries, there were 45 (77.6%) live birth and 18 (31.0%) end up with perinatal death of which 13 still birth which was commonly seen at extreme age, extreme parity and prolonged labour (Table 3).

| | Parity | | | |
|---|---|---|---|---|
| **Fetal Condition** | **0** | **1** | **2 - 4** | **Total** |
| Live | 15 (71.4%) | 20 (90.9%) | 10 (73.3%) | 45 (79.3%) |
| Still | 6 (28.6%) | 2 (9.1%) | 5 (26.7%) | 13 (20.7%) |
| Total | 21 (100%) | 22 (100%) | 15 (100%) | 58 (100%) |

*Table 3: Fetal conditions at birth versus Parity at Gimbi Public Hospitals, 2015.*

**Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia**

288

Out of 45 live newborn from delivery with obstructed labour 26 (57.77%) develop fetal complication. Among the fetal complication, 15 (33.33%) of them occurred with prolonged labour (> 24 hours) while 11 (24.43%) fetal complication with normal duration of labour (≤ 24 hours).

From 45 live birth 23(51.1%) developed asphyxia and 5(11%) neonatal death. Among 263 non-obstructed delivery 11 (4.2%) of death were observed (Table 4).

| Fetal Condition | Age of the mother (in years) | | | | | |
|---|---|---|---|---|---|---|
| | 15 - 19 | 20 - 24 | 25 - 29 | 30 - 35 | > 35 | Total |
| Live | 20 (43.5%) | 11 (26.1%) | 7 (15.2%) | 4 (8.7%) | 3 (6.5%) | 45 (100.0%) |
| Still | 7 (58.3%) | 1 (8.3%) | 1 (8.3%) | 1 (8.3%) | 3 (16.7%) | 13 (100.0%) |
| Total | 27 (46.6%) | 12 (22.4%) | 8 (13.8%) | 5 (8.6%) | 6 (8.6%) | 58 (100.0%) |

*Table 4: Fetal condition among delivery with obstructed labour versus Age of the mother at Gimbi Public Hospital, 2015.*

The study revealed that the perinatal mortality rate was 310 per 1000 total births (18/58) for women who had obstructed labour and 38 per 1000 total births (10/263) among women in the no obstructed group and overall 90/1000 prenatal death found.

Among 58 obstructed labour, 13 (22.41%) of mothers developed maternal complications. From the total 13 maternal complication of OL; PPH accounts 5 (38.46%), ruptured uterus 4 (30.76%), puerperal sepsis 2 (15.38%) and 1 (7.69%) wound infection. One (1.72%) maternal death occurred among the OL (Table 5).

| Fetal complication | Duration of labour (in hours) | | |
|---|---|---|---|
| | 12 - 24 | > 24 | Total |
| Yes | 11 (42.30%) | 15 (57.69%) | 26 (44.82%) |
| No | 22 (68.75%) | 10 (31.25%) | 32 (55.17%) |
| Total | 33(56.89%) | 25 (43.10%) | 58 (100%) |

*Table 5: Fetal complication versus duration of labour among obstructed labour at Gimbi Public Hospital, 2015.*

Out of 263 deliveries without obstruction, 16 (6.08%) of mothers developed maternal complications, these complications were post-partum haemorrhage 10 (62.5%) followed by puerperal sepsis 4 (25%) but there was no death documented.

Among 14 mothers who have developed obstructed labour and faced complication, duration of labour among 10 (71.4%) mothers were greater than 24 hours (Table 6 and 7).

| Maternal complications | Frequency (No) | Percentage (%) |
|---|---|---|
| PPH | 5 | 38.46 |
| Ruptured uterus | 4 | 30.76 |
| Puerperal sepsis | 2 | 15.38 |
| Abdominal distension | 1 | 7.69 |
| Wound infection | 1 | 7.69 |
| Maternal death | 1 | 1.72 |

*Table 6: Maternal complication/outcome among mother with obstructed labour at Gimbi Public Hospital, 2015.*

**Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia**

289

| Maternal complication | Duration of labour (in hours) | | |
|---|---|---|---|
| | 12 - 24 | > 24 | Total |
| Yes | 4 (28.6%) | 10 (71.4%) | 14 (24.13%) |
| No | 29 (65.9%) | 15 (34.1%) | 44 (75.86%) |
| Total | 33 (56.9%) | 25 (43.1%) | 58 (100%) |

*Table 7: Maternal complication versus duration of labour among mothers with obstructed S at Gimbi Public Hospital, 2015.*

### Factors associated with obstructed labour among mothers delivered at Gimbi public hospital, 2015

To identify determinants of obstructed labour, bivariate analysis was applied between each independent variable and obstructed labour and then potentially determinant variables with p ≤ 0.25 taken as candidate for multivariate analysis. The result from multivariate logistic regression analysis showed that obstructed labour is significantly associated with age, parity and birth weight of the baby with p-value < 0.05.

The risk of obstructed labour was 11.22 times higher among mothers of the age group 15 - 19 than mothers of the age group ≥ 35 years (AOR 11.22, 95% CI: 4.43 - 28.42). Concerning the parity, risk of obstructed labour was 24.96 times higher among nulipara mothers than grand multiparas (AOR 24.96, 95% CI: 10.73 - 56.85). The risk of OL is 4.76 times higher among mother who delivered a baby with normal birth weight than underweight new born (AOR 4.76, 95% CI: 1.20 - 18.90) (Table 8).

| Variables | Crude OR (95% CI) | Adjusted OR (95% CI) |
|---|---|---|
| **Age of the mother** | | |
| 15 - 19 | 5.35 (2.19, 13.54) | 11.22 (4.43, 28.42)* |
| 20 - 24 | 0.36 (0.04, 3.46)* | 0.15 (0.03, 0.68) |
| 25 - 29 | 0.37 (0.12, 1.15) | 1.23 (0.07, 2.56) |
| 30 - 34 | 0.46 (0.01 - 2.02) | 0.12 (0.04, 0.40) |
| ≥ 35 | 1.00 | 1.00 |
| **Parity** | | |
| 0 | 4.53 (1.25, 9.11)* | 24.96 (10.73 - 56.85)* |
| 1 | 0.52 (0.85, 2.74)* | 2.36 (0.9, 5.77) |
| 2-4 | 1.13 (0.8, 2.57) | 0.57 (0.07, 1.93) |
| ≥5 | 1.00 | 1.00 |
| **Baby weight (in Kg)** | | |
| < 2.5 | 1.00 | 1.00 |
| 2.5 - 4 | 1.45 (0.36, 3.41) | 4.76 (1.20 - 18.90)* |
| > 4 | 0.46 (0.20, 1.05) | 0.23 (0.026 - 1.98) |

*Table 8: Factors significantly associated with obstructed labour among women delivered at Gimbi public hospital.*
*\* Significant, P value < 0.05.*

Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia

290

## Discussion

Various studies done globally showed that obstructed labour is an important cause of severe morbidity, long-term disability and death among both mothers and their babies [1-14].

The prevalence of obstructed labour among women delivered at Gimbi public hospital was 18.1%, this finding was higher than global prevalence of obstructed labour which was 8% and also higher than study finding done in Asia and SSA including Ethiopia. For instance: study done in Pakistan [6], Uganda [10], India [7] and Latin America and the Caribbean [14] showed that the prevalence of obstructed labour was 5.2%, 10.5%, 1.64% and 13.4% respectively. Also two previous studies from Ethiopia [9,12] showed that the prevalence of obstructed labour was 3.3% and 12.2% which is lower than the current study finding. But research conducted on causes of maternal mortality in Ethiopia 2000 to 2008 [5] indicated that the prevalence of obstructed labor 29% which is higher than the current study. The discrepancy might be because of difference in: duration of the study period, study design, socio cultural, access to antenatal care, labour management and emergency referral.

In this study cephalo-pelvic disproportion (61%) was found to be a major cause of obstructed labour followed by malpresentation (27.1%) which was similar with various study finding. For example, study done at Jimma University specialized hospital [12] and Adigrat [9] of Ethiopia showed that cephalo-pelvic disproportion as a leading cause of obstructed labor were 67.6% and 64.9% respectively. Similarly studies done in Uganda [10], Nigeria [11], India [7] and Pakistan [6] showed that cephalopelvic disproportion as cause of obstructed labour was 63.3%, 62%, 55.59% and 66% respectively.

In current study Caesarean section delivery was performed on 94.7% of the women with obstructed labour and destructive delivery was 5.3%. But the study findings from other parts of Ethiopia [9,12] and sub-Saharan countries like Uganda [10] and Nigeria [11] caesarian section delivery among obstructed labour was lower than the current studies. This gap might be because of difference in the study setup; variation in professional experience; other methods of delivery might be successful; previous history of caesarian section and status of fetus at arrival.

In this study age, parity and birth weight were associated with obstructed labour. This finding was similar with the study result from Uganda [10] and Bangladesh [8] which states age of the mother and parity as determinant factor of obstructed labour. Another similar study conducted in Jimma, Ethiopia indicated that, out of 12.2% cases 8.4% were teenage [12] and a study from Bangladesh stated the majority of cases of obstructed labour were between 25 - 29 years [13]. Women who were delivered for the first or second time may be young and as such be at a higher risk of obstructed labour than those who have delivered more times. Grand multiparas women may also be at a higher risk of obstructed labour from malposition and malpresentation due to lax uterus. Also different studies revealed income, residence, educational status and having ANC visit as factor associated with obstructed labour [8-10,13]. For example, a study done in Adigrat, Ethiopia reveals that from the total obstructed deliveries, only 14.1% of all cases had received antenatal care, and the majority (88%) came from rural areas [9].

The current study reveals, 22.41% of mothers with obstructed delivery developed maternal complications such as PPH, ruptured uterus and sepsis were 35.7%, 28.6% and 14.3% respectively. Other complications such as wound infection, UTI and abdominal distention accounts for 21.4%. Compared with study done in Jimma, Ethiopia [12], commonest maternal complications observed were uterine rupture (45.1%) and sepsis(39.3%) while a study finding from Adigrat, Ethiopia [9] reveals ruptured uterus and sepsis accounts 22.5% and 19.9% respectively; it's also revealed serious complications increased with parity [9]. In south west Uganda sepsis 49.8% uterine rupture followed by PPH (33.9%). Also a study conducted in India indicated the proportion of complications among women with obstructed labor was sepsis (49.8%), PPH (33.9%), UTI (10.9%), wound infection (7.7%) and Rupture uterus (2.5%). But the study finding from Bangladesh [8] also showed maternal morbidity due to different complication accounted for 76.19% of the case while the fetal morbidity was 51.31% of the cases.

Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia

291

The current study finding indicates that maternal case fatality rate among OL is 1.7%. It was due to ruptured uterus and might have been prevented through proper antenatal monitoring and skilled delivery care. The proportion is lower than a study report from Pakistan [6], Nigeria [11] and Adigrat/Ethiopia [9] which was 1.94%, 3.3% and 3.7% respectively. But study finding from Bangladesh [8] and Uganda [10] reveled that the maternal mortality rate among women with obstructed labour was lower than the current study which was 1% and 1.2%. The difference might be because of improper documentation, duration of the study, intervention done and birth preparedness and complication readiness advocated during pregnancy. In general the proportion of women with obstructed labour who developed complications was 3.39 times that of those who did not have the condition. But, this finding is inconsistent with research done in south Uganda [10].

The study also found that adverse outcomes of obstructed labour on the fetus and newborn. Perinatal complication was related with parity, and prolonged duration of labour. Accordingly perinatal complication was more common in > 24 hour duration when compared to normal duration of labour and as parity increases the risk of fetal complication is more likely occurred. Data from Nigeria [11] and Bangladesh [8] also confirm high perinatal mortality following prolonged labour. Study from India [7] and Adigrat/Ethiopia revealed was significantly complication increased with parity [7,9].

This study revealed that the perinatal mortality rate was 310 per 1000 total births for women who had obstructed labour and 42 per 1000 total births among women in the non-obstructed group and overall 90/1000 prenatal death found which is different from other studies done in Africa and Asia. Finding from Uganda [10] showed that Perinatal mortality rate was 142/1000 total births in women with obstructed labour compared to 65/1000 total births in women without the condition. Also study from Kenya showed there were 108 perinatal deaths giving an overall perinatal mortality rate (PNMR) of 118 per 1000 births. The PNMR was significantly higher among women of low literacy, and no ANC visit [13]. Also study from Adigrat/Ethiopia [9], India [7] and Bangladesh [8] showed that PNMR among the obstructed deliveries 555/1000 (55.5%), 71/313 (22.68%) and 24.76% (247/1000) which is lower than the current study finding. The discrepancy may be because of the institution different ability to help babies with good birth practice and availability of skilled personnel and equipment.

## Conclusion

The study showed high prevalence of obstructed labour. The main causes were CPD and malpresentation, most of obstructed labour was managed by caesarian section. Maternal morbidities such as postpartum hemorrhage, uterine rupture and sepsis and maternal mortality were identified among women with obstructed deliveries. Lower/poor perinatal outcome including perinatal mortality was higher among obstructed deliveries. Perinatal complication was related with parity, and prolonged duration of labour. Age of the mother, parity and birth weight are strongly associated with obstructed labour and fetal and maternal outcome.

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## Declarations

### Consent of Participants

The study participants were not human being. The data was collected from delivery registration book. Before data collection permission was taken from Gimbi public hospital administration and the health workers particularly those who were working in the labour and delivery ward were informed about the purpose of the study, and their cooperation was obtained.

**Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia**

292

## Consent for Publication

Gimbi hospital administration, authors and Jimma university research directorate agreed to disseminate and publish the current research result

## Availability of Data and Materials

All the data sets used and/or analyzed during this study are included in the article.

## Competing Interests

The research was done by Daniel S. and Sileshi T. The authors have declared that no competing interests exist.

## Funding

The total cost of the research was covered by the Jimma university research directorate.

## Authors' Contributions

ST initiated and designed the study. DS and ST supervised the data collection. DS and ST did the data analysis and interpretation; DS wrote and reviewed the manuscript. Both authors read and approved the final manuscript.

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**Prevalence and Associated Factors of Obstructed Labour, and its Outcome among Mothers Delivered at Gimbi Public Hospital, Wollega, Western Ethiopia**

293

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**Volume 8 Issue 5 May 2019**