

## Magnitude of Preterm Birth among Mothers who gave Birth in Finoteselam Hospital, North West, Ethiopia, 2019

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### Abstract

**Introduction:** Preterm birth is defined by WHO as all viable births before 37 completed weeks of gestation or fewer than 259 days since the first day of a woman's last menstrual period. Each year, about 15 million babies in the world, more than one in 10 births, are born too prematurely. Complication of preterm birth is the single largest direct cause of neonatal deaths, responsible for 35% of the world's 3.1 million deaths a year, and the second most common cause of under-5 deaths after infection.

**Objective:** The objective of this study was to assess the magnitude of preterm birth in Finoteselam hospital, Northwest, Ethiopia, 2019.

**Methods:** Institutional based cross sectional study was conducted from March 10/2018 to March9/2019 in Finoteselam hospital. Mothers who gave birth in Finoteselam hospital were the source population. Systematic sampling was used to get the total sample size of 189 participants. Data was collected from patient chart review. Data analysis was done using SPSS version 20 software.

**Result:** This study showed that 19 (10.1%) mothers gave a preterm birth from 189 mothers. Conclusion and recommendation: The magnitude of preterm birth in Finoteselam hospital was generally 10.1%. Timely identification of obstetric complications and health education to improve Antenatal care utilization will help minimize the magnitude of preterm birth.

**Keywords:** Preterm; Magnitude; Finoteselam hospital; Ethiopia

### Introduction

Preterm birth is defined by WHO as all viable births before 37 completed weeks of gestation or fewer than 259 days since the first day of a woman's last menstrual period. Each year, about 15 million babies in the world, more than one in 10 births, are born too prematurely. More than one million of those babies die shortly after birth; countless others suffer from lifelong physical, neurological or educational disabilities, often at great cost to families and societies [1].

Preterm are generally high in low and middle income countries. Complications of preterm birth are the leading direct causes of neonatal mortality and account for an estimated 27% of neonatal deaths. This comes to almost four million neonatal deaths every year [2]. From a global standpoint, the prevalence rate of preterm birth varies from 47.5 to 137 per 1000 live births. Grand multiparity, a previous history of preterm birth or abortion, younger maternal age, inadequacy of prenatal care, reported hypertension, ante partum hemorrhage, premature rupture of fetal membranes and induced labor are significant determinants of preterm birth [3].

Preterm birth is the single most direct cause of neonatal deaths, responsible for 35% of the world's 3.1 million deaths a year and the second most common cause of under-5 deaths after infection [2]. Of all early neonatal deaths (deaths within the first 7 days of life) that are

not related to congenital malformations, 28% are due to preterm birth [3]. In addition to its significant contribution to mortality, infants born preterm are at increased risk for respiratory morbidities, temperature instability, hypoglycemia, sepsis, hyperbilirubinaemia, necrotizing enterocolitis and neurological morbidities. Globally preterm neonates take the first place for neonatal intensive care unit (NICU) admission and longer hospital stay [4]. Complication of preterm infants results in significant cost to the health sector, parents and the society [5, 6].

According to the 2014 World Health Statistics Report, Ethiopia has achieved MDG 4 target three years earlier by reducing under-five mortality by 67% from the 1990 estimate. However the reduction in mortality in neonatal age groups (48%) is not as impressive as that of childhood mortality and premature birth is the leading cause of neonatal deaths and accounts 37% [7].

Even though the prevalence of preterm delivery is one of the strongest predictors of neonatal mortality, there is a limited study on the study area in our country. Therefore this study was done to fill this gap.

## Objectives

### General objective

Magnitude of preterm birth among mothers who gave Birth in Finoteselam hospital, Northwest, Ethiopia, 2019.

### Specific objective

To determine the magnitude of preterm birth among mothers who gave birth in Finoteselam, hospital, 2019.

## Methods and Materials

### Study Area and Period

The study was conducted in Finoteselam Hospital, situated at Finoteselam town in west Gojjam Zone, Amhara National Regional State, which is 387 km far from the capital city of Ethiopia, Addis Ababa and 176 km from Bahirdar a city of the regional state. The Hospital provides health service to more than 2.5 million populations. It has 74 beds with 122 staffs for in and out patient service. Gynecology and Obstetrics Department is one of the department serving both regular and referral patients. Annually give delivery service for 2984 mothers. The data was collected from April 1-5/ 2019 on 189 Mothers card who gave Birth in Finoteselam hospital from March 10/2018 to March 9/2019 to determine the magnitude of preterm.

### Study design

Institutional based cross sectional study was conducted.

### Source population

Mothers who gave birth in Finoteselam hospital.

### Study population

Selected cards of those mothers who gave birth at Finoteselam hospital from March 10/2018 to March 9/2019.

### Inclusion and exclusion criteria

#### Inclusion criteria

All maternal cards preterm and term with no missing the most important information (detail records on demographic characteristics, current obstetric history, medical history and past obstetric history and delivery summary) were included.

#### Exclusion criteria

Maternal card with unknown last normal menstrual period (LNMP) and had no first trimester ultrasound were the exclusion criteria for this study.

#### Sample size determination

The sample size was determined by using a single population proportion formula considering the following assumptions: From recent institutional based cross sectional studies on preterm birth in Ethiopia, prevalence of preterm birth was estimated to be 14.3%. There

for by using prevalence 0.143, 95% confidence interval and absolute precision 5%, the total sample size is 189.

### Sampling technique and procedure

Systematic random sampling and card reviewing method was used. First the sample for the hospital was arranged based on the one year patient flow prior to the data collection period by referring delivery registration book. Systematic sampling was employed to select the study cards. To calculate K, the total of one year delivery report for the hospital which was 2984. Then  $K=N/n$ ,  $=2984/189=15.78=16$ , the first study participant was selected by lottery method. Therefore; every 16 card was reviewed. If the selected study card not eligible for the study the next card was taken.

### Variables of the study

#### Dependent variable

- Preterm birth

#### Independent variables

- Socio-demographic variable of the mother
- Residency, Age, Ethnicity

#### Pregnancy related factors

- ANC
- Parity
- RH factor
- Bad obstetric history
- Status of HIV

#### Obstetric complications

- APH
- PROM
- PIH
- Multiple pregnancy
- Polyhydraminous
- Anemia

#### Medical illnesses

- Cardiac disease
- Hypertension
- UTI
- Asthma
- Malaria

### Operational definitions

**Anemia:** According WHO, the pregnancy anemia defined as HGB level below 11 gm/dl (HCT<33%).

**Preterm birth:** Defined by WHO as all viable births before 37 completed weeks of gestation or fewer than 259 days since the first day of a woman's last menstrual period.

### Data collection tools and procedures

Data was collected by chart review. Since the file is kept at record office after discharge, data collection was done using structured checklist from clinical records of mothers' (registration books and individual cards). Cases was identified from the record office through reviewing every record of women who gave birth at Finoteselam

hospital, March 10/2018 to March 9/2019. The checklist was structured into four sections (socio demographic characteristics, obstetrics related factors; medical history and pregnancy related factors). Data was collected by two BSc midwives after giving one day training. The data collection process was supervised by one BSC midwife supervisor and the principal investigator.

### Data processing and analysis

The checklist was checked visually, coded and entered into SPSS version 20 software packages for analysis. All descriptive statistics was computed. Frequencies and percents were used to summarize descriptive statistics of the data. Tables and graphs were used to present the results.

### Data Quality Control

Pretest was done and necessary correction was done after the pretest. The collected data was checked out for the completeness, accuracy and clarity by the supervisor and principal Investigator. This quality checking was done daily after data collection and amendments was made before the next data collection time. Data clean up and cross-checking was done before analysis. Supervision was done at the spot by principal investigator.

### Ethical Consideration

Ethical clearance was obtained from College of health science, Debre Markos University ethical review committee. Permission letter was submitted to Finoteselam Hospital to get their willingness. The purpose and the importance of the study were explained and informed consent was secured from Ward head. Confidentiality and privacy was maintained by omitting personal identifier of participant during data collection procedure.

### Results

#### Socio-Demographic characteristics of the of the Respondents

From 189 sample size, all 189 study cards were reviewed. The mean age of the study participants was 27.7 with SD of 5.8, more than half of the participants between 20-34 years, 120(63.5%). Almost all are Amhara by ethnicity, 177(93.6%) and 101(53.4%) were urban by resident. For more information look at **Table 1** below:

| Variable  | Category | Frequency | Percent(N=189) |
|-----------|----------|-----------|----------------|
| Resident  | Urban    | 101       | 53.4           |
|           | Rural    | 88        | 46.6           |
| Age       | <=19     | 45        | 23.8           |
|           | 20-34    | 120       | 63.5           |
|           | >=35     | 24        | 12.7           |
| Ethnicity | Amhara   | 177       | 93.6           |
|           | Oromo    | 6         | 3.2            |
|           | Tigrie   | 6         | 3.2            |

**Table1:** Socio-Demographic characteristics of mothers in Finoteselam hospital, 2019.

### Obstetric and medical related characteristics

As shown in **Table 2** below, the magnitude of preterm birth in this study was found to be 19(10.1%). Majority of the participants (91%) had ANC follow up and nearly three fifth of them had at least 4 number of visits (61.9%). Majority of the participants are multipara (71.4%). More than three quarters of the participants (85.7%) gave

birth by SVD and onset of labor is spontaneous (83.6%). One sixth of participants had one or more obstetric complications (16.4%) and one in four mothers had history of medical illnesses. Majority of the participants are RH positive (92.1%), haemoglobin>=11(84.1%) and one quarters of the participants had history of premature rupture of membrane.

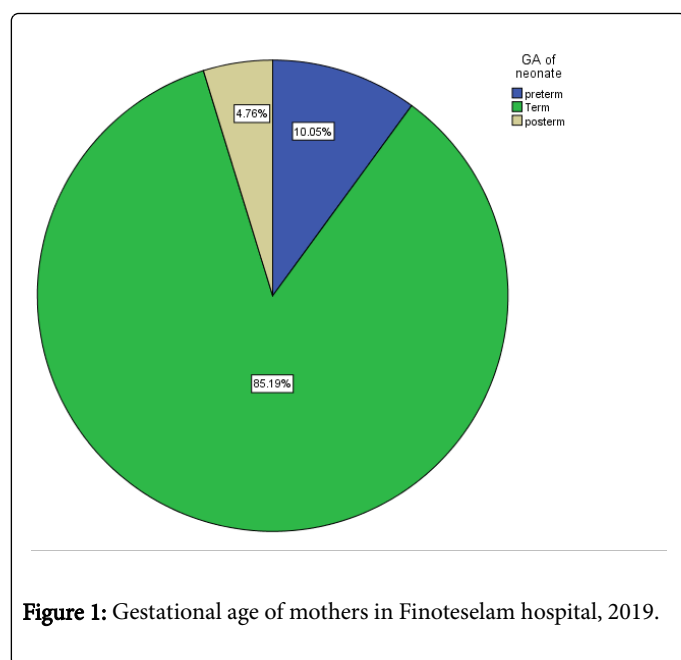
| Variable      | Category  | Frequency | Percent(N=189) |
|---------------|-----------|-----------|----------------|
| Parity        | Primipara | 54        | 28.6           |
|               | Para2-5   | 112       | 59.3           |
|               | Para>5    | 23        | 12.1           |
| ANC follow up | Yes       | 172       | 91             |
|               | No        | 17        | 9              |

|                                |                    |     |      |
|--------------------------------|--------------------|-----|------|
| Number of ANC                  | <4 times           | 117 | 61.9 |
|                                | >=4times           | 55  | 29.1 |
| poor obstetric history         | Preterm            | 12  | 6.3  |
|                                | Stillbirth         | 18  | 9.5  |
|                                | Abortion           | 23  | 12.2 |
| Mode of delivery               | SVD                | 162 | 85.7 |
|                                | Instrumental       | 17  | 9    |
|                                | C/S                | 10  | 5.3  |
| Status of labor                | Spontaneous        | 158 | 83.6 |
|                                | Induced            | 21  | 11.1 |
|                                | Elective C/S       | 10  | 5.3  |
| Status of HIV                  | Positive           | 5   | 2.6  |
|                                | Negative           | 184 | 97.4 |
| Blood RH factor                | Positive           | 174 | 92.1 |
|                                | Negative           | 15  | 7.9  |
| PROM                           | Yes                | 25  | 13.2 |
|                                | No                 | 164 | 86.8 |
| HGB                            | <11                | 30  | 15.9 |
|                                | >=11               | 159 | 84.1 |
| Gestational age at delivery    | <37                | 21  | 10.1 |
|                                | 37-42              | 161 | 85.2 |
|                                | >42                | 9   | 4.8  |
| Obstetric complication         | Yes                | 31  | 16.4 |
|                                | No                 | 158 | 83.6 |
| Type of obstetric complication | APH                | 10  | 5.3  |
|                                | PIH                | 11  | 5.8  |
|                                | Multiple pregnancy | 9   | 4.5  |
|                                | Polyhydraminous    | 1   | 0.5  |
| History of medical illness     | Yes                | 38  | 20.1 |
|                                | No                 | 151 | 79.9 |
| Type of medical illness        | CHTN               | 7   | 3.7  |
|                                | DM                 | 8   | 4.2  |
|                                | Heart failure      | 2   | 1.1  |
|                                | Asthma             | 1   | 0.5  |
|                                | UTI                | 19  | 10.1 |

|  |         |   |     |
|--|---------|---|-----|
|  | Malaria | 5 | 2.6 |
|--|---------|---|-----|

**Table 2:** Obstetric and medical related characteristics of the study participants in Finoteselam hospital, 2019.

The magnitude of preterm birth in this study was found to be 19(10.1%). **Figure 1** below shows gestational age of delivered babies.



**Figure 1:** Gestational age of mothers in Finoteselam hospital, 2019.

## Discussion

In this study the overall magnitude of preterm birth was found to be 19(10.1%). The finding was in line with the preterm birth rate for Africa (11.9%) and North America (10.9%) estimated in WHO bulletin published in 2010 [5]. It was also in line with the prevalence of preterm birth in Ethiopia, 10.1% which was reported by the Global Action Report on Preterm Birth in 2010 [8].

The finding of this study was in line with the study conducted in Debremarkos town health institutions on 2013 which was 11.6% [9] but lower than the studies conducted in Debretabor town health institution on 2016 which was 12.8% and the study conducted at Gondar university hospital on 2013 in which the prevalence of preterm birth was 14.3% [10,11].

The prevalence of preterm birth in this study however was higher than another cross sectional study conducted in our country at Gondar town health institutions on 2012, which reported the prevalence rate of 4.4% [12]. This discrepancy may be due to difference on exclusion criteria for multiple pregnancies. In our study mothers with multiple pregnancy were included, whereas these mothers were excluded from the mentioned study. Therefore lower rate is expected in their study as over distention of the uterus as in multiple pregnancy and polyhydraminous is one of a scientifically explained causative factor for preterm labor. The finding of this study was also higher than the prevalence of most developed nations, preterm birth rate from a 2013 published population based cohort study conducted in Sweden which was estimated to be 5.03% [13]. Low preterm birth rate in developed nations like Sweden is may be due to high socio-demographic status

and improved pre conceptional and ANC services which are important in early identifying and preventing risk factors.

The prevalence of preterm birth in our study was found to be lower than some studies conducted in low and middle income countries. For instance in a secondary analyses study conducted in Malawi on 2013, a prevalence rate of 16.3 % was reported [14]. This higher prevalence of preterm birth in Malawi may be due to the country has higher HIV infection rate where one in four woman are HIV positive. In Brazil a national cross-sectional study among young women attending public hospitals in 2009 show a prevalence of preterm birth to be 21.7% which was higher than this study [15]. The discrepancy may be due to variation in the study population; since only parturient mothers aged 15-24 were included in their study. Similar cross-sectional study conducted in Nigeria on 2012 reported a prevalence of preterm birth of 23.7% [16] which was also higher than this study. This variation is may be because of the difference in a study area where their study was at a referral hospital with referrals of more complicated cases from other general hospitals.

## Conclusion

Generally prevalence of preterm birth in Finoteselam hospital was 10.1%. It shows preterm is still a public health problem.

## Recommendations

### For zonal and local health administrators

- Educating the community to improve ANC service utilization of mothers using mass Medias and through different methods.
- Upgrading the capacity of health institutions to be able to early identify and treat obstetric complications through logistic and human resources.

### For health professionals

- Upgrading their capacity to be able to early identify and treat obstetric complication.

### Researchers

- Should do further wide research on this area. Since there is scarcity of similar articles done in our country.

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