# MAGNITUDE OF PUERPERAL SEPSIS AND ASSOCIATED FACTORS AMONG POSTPARTUM WOMEN ADMITTED TO PUBLIC HOSPITALS OF JIMMA ZONE, OROMIA REGIONAL STATE, SOUTH WEST ETHIOPIA.

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A research thesis submitted to school of Nursing and Midwifery, faculty of health sciences, institute of health, Jimma University; in partial fulfillment of the requirements for the Masters of science degree in Maternal health Nursing.

June, 2019

Jimma, Ethiopia

**JIMMA UNIVERSITY**

**FACULTY OF HEALTH SCIENCES**

**SCHOOL OF NURSING AND MIDWIFERY**

# MAGNITUDE OF PUERPERAL SEPSIS AND ASSOCIATED FACTORS AMONG POSTPARTUM WOMEN ADMITTED TO PUBLIC HOSPITALS OF JIMMA ZONE, OROMIA REGIONAL STATE, SOUTH WEST ETHIOPIA.

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## ABSTRACTS

**Introduction:** Puerperal sepsis is any bacterial infection of the genital tract, which occurs as a complication of delivery or childbirth. It is among the leading causes of preventable maternal morbidity and mortality not only in developing countries but also in developed countries which accounts 10.7% and 4.7% of maternal death respectively. puerperal sepsis was among common cause of maternal mortality and morbidity and also an increment of puerperal sepsis in Sub-Saharan Africa; the separate study on prevalence as well as factors associated with puerperal sepsis was limit. Therefore, the present study was conducted to determine the prevalence and factors associated with puerperal sepsis among postpartum women.

**Objectives:** To assess the magnitude of puerperal sepsis and associated factors among postpartum women admitted to public hospital of Jimma zone, Oromia, southwest, Ethiopia, 2019.

**Method and material**: A cross-sectional study was carried out in public hospitals from April - May 15, 2019 in Jimma Zone, Oromia region, southwest Ethiopia. Study samples were selected by systematic sampling procedure that full fills the inclusion criteria to be selected during the study period. EPI data version 3.1 was used to enter the data. SPSS version 23 was used for analysis of the data and the result was presented in table and chart. Bi-variate and multivariable logistic regressions were carried out to determine the association between the outcome variable and independent variables.

**Result:** A total of 406 postpartum women were interviewed out of 422. The mean age of respondents was 26.2 (±5.2) years. Majority of the respondents 388 (95.6%) were married and 239 (58.9%) were rural resident. Totally 48 (11.8%) women developed puerperal sepsis. Grand multi-para (AOR=3.79, 95% CI, 1.3-10.7), home delivery (AOR = 5.721, 95% CI: 1.835-17.837), premature rupture of membranes (AOR= 4.842, 95% CI, 2.004-11.697), prolonged labour (AOR= 2.662, 95% CI, 1.195-5.929) and episiotomy or genital tear (AOR= 4.066, 95% CI: 1.535-10.77) were significantly associated with puerperal sepsis.

**Conclusion and recommendation:** Magnitude of puerperal sepsis was high compared to others studies so, policy maker and professionals should work to decreases prevalence of puerperal sepsis and tackle factors associated with the development of sepsis.



**Key wards:** puerperal sepsis; magnitude; associated factors; Jimma zone public hospital.

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## LIST OF ABBREVIATIONS AND ACRONYMS

ANC: Antenatal Care

AOR: Adjusted Odd Ratio

CI: Confident Interval

CSA: Central Statistical Agency

EDHS: Ethiopia Demographic and Health Survey

HIV: Human Immunodeficiency Virus

ICD: International statistical Classification of Diseases

MMR: Maternal Mortality Ratio

PNC: Postnatal Care

PROM: Premature Rupture of Membranes

PS: Puerperal Sepsis

SD: Standard Deviation

SPSS: Statistical Package for the Social Sciences

SSA: Sub-Saharan Africa

STI: Sexual Transmitted Infections

TBA: Traditional Birth Attendant

WHO: World Health Organizations

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# CHAPTER ONE: INTRODUCTION

## 1.1 Back Ground

According to International Classification of Diseases (ICD-10), puerperal fever is a "temperature rise above $38^0$ C maintained over 24 hours or recurring during the period from the end of the first to the end of the tenth day after childbirth" (1).

Puerperal sepsis is an infection of the genital tract, which occurs as a complication of delivery. Puerperal fever is considered to be due to genital tract infection unless proved otherwise (2).

Puerperal sepsis (PS) is a postpartum pelvic bacterial infection contracted by women after vaginal or abdominal delivery. The condition is identified by fever at 1 day postpartum, although more rapid and severe infection leading to death may occur. Puerperal sepsis has been recognized as a major contributor to maternal and newborn morbidity since ancient times (3).

World Health Organization (WHO) defines puerperal sepsis as any bacterial infection occurred between the rupture of membranes and the first 42 days postpartum, with at least two of the following conditions: pelvic pain, fever (temperature equal or higher than 38.5°C) and purulent and foul-smelling vaginal discharge or delayed uterine involution. It usually occurs after the first 24 hours and within the first ten days following delivery (4).

Klebsiella aerogenes, staphylococcus aureus, streptococcus pyogenes, Pseudomonas aeruginosa Proteus, coagulase negative Staphylococci and E. coli are among the common organisms, which causes puerperal infection (5).

Vaginal examination at intervals of four hours for routine assessment of active first stage of labor; Routine antibiotic administration for women with preterm prelabour rupture of membranes, undergoing manual removal of the placenta, in third or fourth degree perineal tear and undergoing elective or emergency caesarean section are among WHO recommendation in prevention of puerperal sepsis (6).

According to the 2016 EDHS, 62.4% of women received antenatal care from a skilled provider. The majority of births (42%) were attended by traditional birth attendant, Only 26% of women gave birth in a health facility or with a skilled birth. only 17% of women received postnatal care within 48 hours of birth (7).

## 1.2 Statement of the Problem

About 830 women die from preventable pregnancy and childbirth related complications around the world every day. In which ninety nine percent of all maternal deaths occur in developing countries. More than half (66.3%) of deaths occur in sub-Saharan Africa and almost one third occur in South Asia. Maternal mortality is higher in women living in rural areas and among poorer communities. It was estimated that in 2015, around 303,000 women died during and following pregnancy and childbirth global (8). Recently, United Nation Sustainable Development Goals (SGD) aim for global maternal mortality ratios to reach 70 per 100,000 live births by 2030 (9).

Puerperal sepsis is among the leading causes of preventable maternal morbidity and mortality not only in developing countries but also in developed countries which accounts 10.7% and 4.7% of maternal death respectively (10). It has been found as the second most common cause of maternal morbidity and mortality in the developing world (11).

In Pakistan among obstetric admission 3.89% women had puerperal sepsis and 8.52% of the women died (12).

In Sub-Saharan Africa maternal mortality secondary to puerperal sepsis increased from 9.7% in 2009 (13) to 10.3% in 2014 (10). In a retrospective study from Mbarara Uganda, puerperal sepsis accounted for 30.9% of maternal deaths and it was the leading causes of maternal deaths followed by postpartum hemorrhage 21.6 % (14).

Based on the maternal death review conducted in 2008, puerperal sepsis accounts for 15.3% maternal deaths in Ethiopia (15). Another study on maternal death also stated that sepsis was the fourth commonest causes of maternal deaths in Ethiopia which accounts for 13% (16). According to Ethiopia Demographic and Health Survey (EDHS) 2016, report maternal mortality ratio was 412 per 100,000 live births. Thus, for every 1,000 live births, approximately four women died during pregnancy, childbirth, or within 2 months after childbirth (7). In Ethiopia, 7.4% of maternal deaths were registered in 2017; of this, 9.3% of them were in Oromia region. This majority of deaths were occurred during delivery and postpartum period. Overall 15% died during pregnancy, 16% during delivery and 68% during the postpartum period. Sepsis accounts for 10% of maternal death (17).

Study conducted in Jimma University Specialized Hospital, southwest Ethiopia One-fifth of maternal deaths were due to intrapartum or postpartum complications. These complications occurred in 45 (7.5%) of the women, out of whom 24 (53%) died and puerperal sepsis accounting for 15.7% of the total deaths (18).

Study conducted in Dessie referral hospital, Ethiopia stated that 5.7% women were developed puerperal sepsis during childbirth and post-partum period (19).

Some of the Risk factors of infection/puerperal sepsis identified by the researchers were breakdown of hygiene standards during delivery and post delivery care, prolonged manipulation of patients during delivery, prolonged labor, frequent vaginal examination, premature rupture of membranes, and use of unsterilized/unwashed instruments during delivery as well as poor sanitary conditions and inadequate services within health facilities (20).

Even though several studies in Ethiopia shows that puerperal sepsis was among common cause of maternal mortality and morbidity and also an increment of puerperal sepsis in Sub-Saharan Africa; the separate study on prevalence as well as factors associated with puerperal sepsis was limit. Therefore, the present study was conducted to determine the prevalence and factors associated with puerperal sepsis among postpartum women admitted to public hospitals of Jimma zone, Oromia regional state, Southwest Ethiopia.

## 1.3. Significance of the Study

The finding and recommendations from this study may helpful for local health planners, Jimma zonal health department, NGOs and other stakeholders as baseline information for planning and implementation of interventions.

Furthermore, the result obtained from this study will provide baseline information and directions for further research activities in the area.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

The World Health Organization (WHO) estimates up to 15 percent of expected births worldwide develop life-threatening complications during pregnancy, delivery or the postpartum period (21). Countries in sub-Saharan Africa (SSA) reduced maternal mortality by 49%, from 990 to 510 per 100,000. Still, nearly two-thirds (62%) of maternal deaths occurred in the SSA region. East African countries reduced MMR by 57% from 1,000 to 440 per 100,000 (22).

## 2.2 Magnitude of puerperal sepsis

According to study conducted in California, United States of America only 0.1% mothers developed puerperal sepsis (23). Again, another study in USA showed that sepsis contributed to an incidence rate of 29.4 cases per 100,000 births and an increasing trend in sepsis incidence was noted between 2003 and 2008. There were 69 reported maternal deaths secondary to sepsis, yielding a case fatality rate of 4.4 per 100 births (24).

Study conducted in Ayub, Pakistan reports that puerperal sepsis as 1.74% of all obstetrical admissions, 34.4% of post partum complications and 14.2% sepsis related mortality (25).

A cross sectional study conducted in Rwanda University Teaching Hospital of Kigali stated that 15% of postpartum women were diagnosed puerperal sepsis upon arrival at the tertiary center. The overall maternal mortality among patients admitted with severe post-partum infections was 5% (26). Study conducted among women of Uganda shows that the incidence of postpartum fever was 5% (27). A retrospective cross sectional study conducted in Maiduguri, Nigeria shows that the incidence of puerperal sepsis was 0.78% (28). Similar study conducted in Pumwani maternity hospital, Kenya stated that the prevalence of puerperal sepsis was 12.2% (29).

## 2.3 Associated factors of puerperal sepsis

### 2.3.1 Socio-demographic status

Older women (≥35 years), black women, lower income earners, and smokers had the greatest risk of developing maternal sepsis (24). Another study conducted in California, United States of America also stated there were significant differences in women age who were ≥25 years, High school or less (23). But population based study conducted in Scotland, UK; shows women age <25 years five times more risk (30).

Study conducted in Ayub, Pakistan the mothers who developed puerperal sepsis was mostly young (66.3%). It is again highly related to triad of poverty, illiteracy and social constraints (25). Study conducted among women of Uganda of shows that the mean age was 25.2 years (SD, 5.5 years), while formal employment associated with reduced odds of postpartum fever (27).

### 2.3.2 Obstetric related factors

Population based study conducted in the USA stated that Eclampsia, preterm birth, post-partum hemorrhage, chorioamnionitis, peripartum hysterectomy were significant risk factors for the development of sepsis; premature rupture of membranes, post-term pregnancy and instrumental delivery were less likely to occur in those who eventually developed sepsis (24). Similar study conducted in Scotland stated that operative vaginal delivery, multiparty, caesarean section and preterm birth were a significant risk factors for puerperal sepsis (30). Another study conducted in California, United States of America Primary caesarean, Repeat caesarean in developing sepsis. But there were no significant differences in parity, Preeclampsia, Postpartum hemorrhage, Wound complication, Hysterectomy, Prenatal care (23).

The major proportion of puerperal sepsis is from home deliveries (73.9%) and of lower parity (63%). The study also reveals 10.8% cases of puerperal sepsis with caesarean sections and mode of delivery in itself does not affect sepsis rate if optimal aseptic measures are taken; prolonged labour increase rate of sepsis (58.6%) (25). Cesarean sections was associated with a 5 fold to 20 fold increased risk of infection compared to vaginal delivery (31).

According to a cross sectional study conducted in Rwanda University Teaching Hospital of Kigali Cesarean delivery associated with a higher rate puerperal sepsis (82%) (26). Similar study conducted among women of Uganda states that, cesarean delivery and multi parity was significantly associated with puerperal sepsis (27). Again study conducted in Maiduguri, Nigeria shows that risk factors for development of puerperal sepsis were un booked status, home delivery, perineal tear or episiotomy and caesarean section (28). Study conducted in Pumwani maternity hospital, Kenya stated that the labour lasting > 24 hours, C/section and obstructed labour were risk factors of puerperal sepsis (29).

A retrospective cross sectional study conducted in Dessie referral hospital, Ethiopia shows that vaginal examination, body temperature, Cesarean section, home delivery, labour greater than 24hrs and duration of membrane rupture were the most significant association with development of puerperal sepsis during child birth and postpartum period (19). Similar study conducted at public hospitals of West Shoa zone, Oromia, Ethiopia stated that duration of labor > 25 hrs, vaginal examinations greater than five times, delivery by C/S and rupture of membrane greater than 24 hrs were independent determinants of puerperal sepsis (32).

### 2.3.3 Maternal co morbidities factors

Diabetes has no associated with puerperal sepsis (23) But study conducted in Scotland, UK; obese women had twice the odds of sepsis compared with women of normal weight and Anaemia was significantly associated with puerperal sepsis (30).

study conducted among women of Uganda shows that 12% were HIV-infected and no associated with puerperal sepsis but history of other sexually transmitted infection (STI) during pregnancy significant associated with puerperal sepsis (27). Similar study conducted in Zimbabwe stated that no statistically significant between-group differences were found among participants with CD4-positive T cell counts of 200–500/$mm^3$ versus those with results of greater than 500/$mm^3$ (33).

### 2.3.4 Health facility factors

Postpartum hospital stay and distance from hospital were not significant associated with puerperal sepsis (19, 23, 34).

## Conceptual framework

Several factors were identified to have an influence on puerperal sepsis namely; socio-demographic factors, obstetric factors and facility characteristics (12, 27, 30, 34, 35).

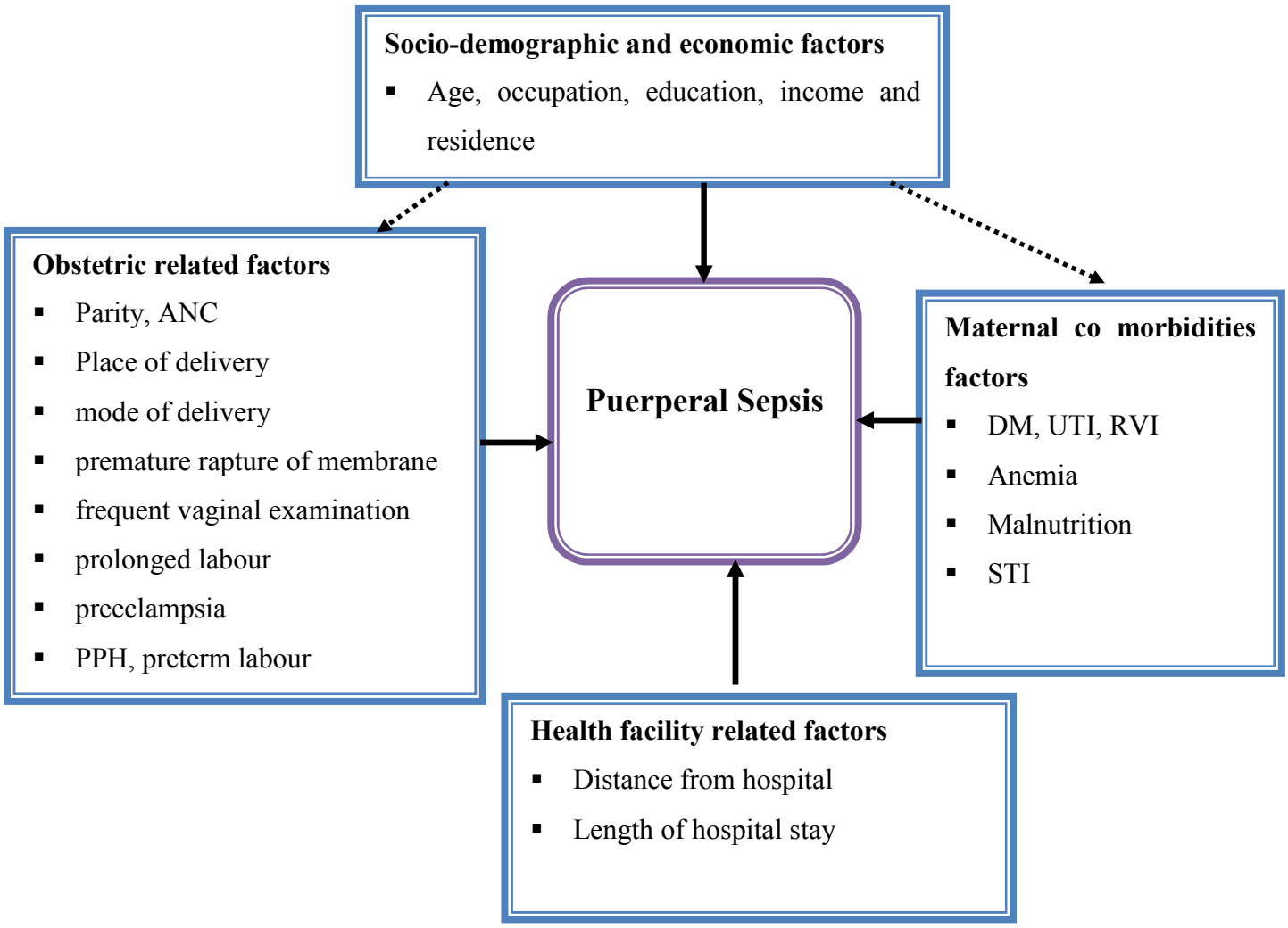


**Fig. 1 Conceptual Framework**

# CHAPTER THREE: OBJECTIVE

## General objective

- To assess puerperal sepsis and associated factors among postpartum women admitted to public hospitals of Jimma zone, Oromia region, Southwest Ethiopia, 2019.

## Specific Objectives

1. To determine the magnitude of puerperal sepsis among postpartum women admitted to public hospitals of Jimma zone.
2. To identify the associated factors of puerperal sepsis among postpartum women admitted to public hospitals of Jimma zone.

# CHAPTER FOUR: METHOD AND MATERIAL

## 4.1 Study Area and Period

The study was carried out in public hospitals from April - May 15, 2019 in Jimma Zone, Oromia region, which is located at 356 km from the capital city of Ethiopia, Addis Ababa (Finfinne) to southwest. Based on the 2007 Census conducted by the CSA, this Zone has a total population of 2,486,155, an increase of 26.76% over the 1994 census, of whom 1,250,527 are men and 1,235,628 women; with an area of 15,568.58 square kilometers, Jimma has a population density of 159.69. In this zone there are seven public hospitals namely, Jimma medical center, Shenen Gibe, Agaro, Limmu, saka, Nada and Setema district hospitals.

## 4.2 Study Design

Facility based cross-sectional study was employed.

## 4.3. Population

### 4.3.1. Source of Population

All postpartum women admitted at public hospitals in Jimma zone were included.

### 4.3.2. Study population

All sampled postpartum women admitted at public hospitals in Jimma zone during data collection period were included.

## 4.4 Eligibility Criteria

### 4.4.1. Inclusion criteria

Postpartum women (normal delivery, Post C/S and women with postpartum complications) admitted to public hospitals in Jimma Zone were interviewed.

### 4.4.2 Exclusion Criteria

Postpartum women who discharged within the first 24 hrs after birth at the time of data collection period were excluded.

## 4.5. Sample size and sampling technique

**4.5.1 Sample size:** The sample was determined using the single population proportion formula. Considering the prevalence of 50%, level of confidence 95%, and margin of error 5%, the sample size calculated as follows:

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

Where,

n - Initial Sample size

Z- Standard normal value at 95% CI that is 1.96

p- Estimated population proportion is 0.5

d- Possible margin of error tolerated which is 0.05.

$$n = \frac{(1.96)^2 \times 0.5(1 \quad 0.5)}{(0.05)^2}$$

n = **384**

By adding non-responses rate of 10% then the final sample size was 422.

$n_f$ = 384+ 384*0.01

= 384 + 38

= **422**

### 4.5.2 Sampling procedures

All public hospitals (seven) found in Jimma zone were included for the study. Subsequently, the final sample size was proportionally allocated to each hospital as per their client flow. Though, the postpartum women were selected from each hospital using systematic sampling technique. Accordingly, participants were interviewed every two individuals **(K value** $= \frac{634}{422} =$ **2)**. The first 1-2 participant was selected by lottery method.

**Proportional allocation for each hospital**

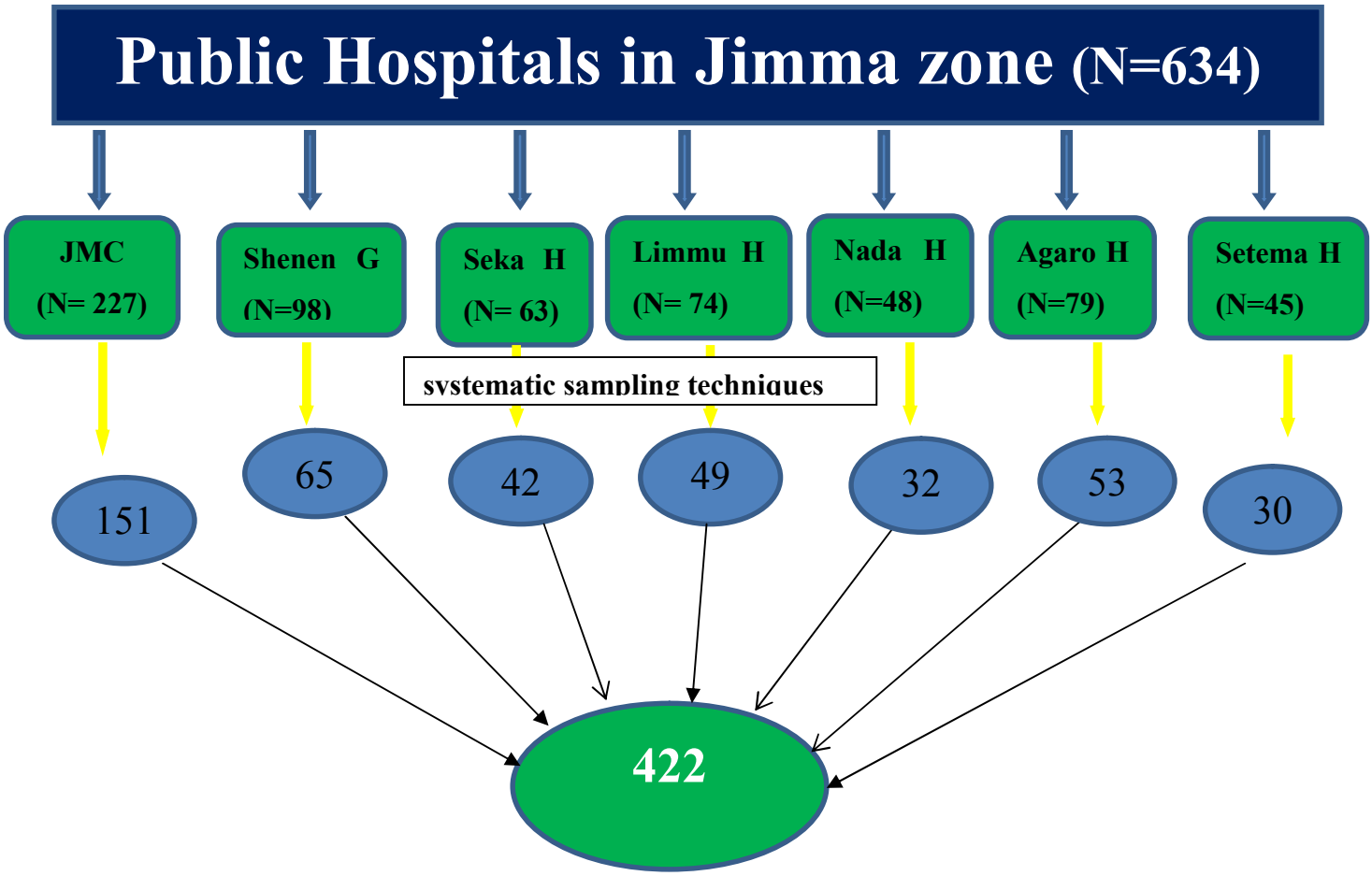


Fig.2: Schematic presentation of the sampling procedure for the selection of sample post partum women admitted in public hospital in Jimma Zone, Oromia. Ethiopia, March 2019.

### 4.6 Data collection instrument and procedure

Semi structured questionnaires were adapted and modified from study conducted in Kenya (34) and different literatures (19, 23).The English version questionnaire was translated into Afaan Oromo by expert, then translated back in to English by another expert.

The items were mainly focused on socio-demographic factors, obstetrics characteristics, Preexisting medical and Co-morbid conditions and facility related factors. These Data were collected through face-to-face interview method from postpartum women till the required sample size was obtained.

The questioners such as temperature measurement and clinical manifestations/signs and symptoms related puerperal sepsis were included. Then the data collectors compiled the information from the women and cross checked it with her diagnoses (patient cards) and consulted physician for the diagnoses.

Furthermore, Patient cards were reviewed to collect information on diagnosis of preexisting medical or Co-morbid conditions.

In order to collect the data, Seven B.Sc. midwives and two M.Sc. Nurses were recruited as data collectors and supervisor respectively.

**Measurement tool**

Digital Thermometer (DT) was used for measuring body temperature. Even though statistical significant differences were noted between GMT and DT, the strong correlation, good agreements, and clinical insignificances make DT good alternative to the traditional GMT. Advantage of DT such as: rapid result delivery, improved patient comfort, being an easy and noninvasive procedure makes DT good alternative to the traditional glass mercury thermometer (36). Therefore, the body temperature of the women was measured using digital thermometer in this study.

**How to Use a Digital Thermometer**

1. Greet the mother and introduce your self
2. Take oral consent
3. Introduce the procedures to be carried out to the mother
4. Activate the unite by pressing the on button
5. Place the thermometer tip midpoint in the axilla; ensure the woman's arm is held firmly against that side of the body for the full duration of the procedure.
6. When the display stops flashing the buzzer beep indicating that the peak temperature has been reached
7. Remove the thermometer and record the temperature.
8. After using the thermometer, remove the probe cover. Clean the thermometer end with a soapy cotton ball or tissue and cool water. Rinse it with cool water.

## 4.7 Variables

### 4.5.1 Dependent Variable

- ❖ Puerperal sepsis

### 4.5.2 Independent variables

- ❖ Socio demography and economic factors
  - ✓ Educational level
  - ✓ Age
  - ✓ marital status
  - ✓ Residence
  - ✓ Occupation
  - ✓ income
- ❖ Obstetric factors
  - ▪ Parity
  - ▪ Birth attendant
  - ▪ mode of delivery
  - ▪ prolonged labor
  - ▪ place of delivery
  - ▪ antenatal visit
  - ▪ Vaginal examinations
  - ▪ PROM
  - ▪ Prophylaxis antibiotics
  - ▪ Preeclampsia
  - ▪ PPH, preterm labour
- ❖ Health facility factors
  - o Distance from hospital
  - o Length of stay hospital
  - o Hygiene practice
- ❖ Preexisting medical and Co-morbid conditions
  - ▪ Diabetics, UTI, STI, HIV, anemia and malnutrition

### 4.8 Operational and term definitions

**Puerperal sepsis**: - Those women who have body temperature greater than 38.5$^{o}$C and one or more of the following sign and symptoms: - pelvic pain, foul-smelling vaginal discharge, abnormal vaginal discharge (presence of pus) and delay in the rate of reduction of size of uterus (<2cm/day during first 8 days) are considered as puerperal sepsis (4).

**Prolonged labor-:** as onset of regular, rhythmical painful contractions accompanied by cervical dilation where labour is longer than 24 hours (37).

**PROM: -** Spontaneous rupture of the membranes any time beyond 28th week of pregnancy but one hour before the onset of labor.

**Prolonged PROM:** is any premature rupture of membranes that persists for more than 8 hours.

**Frequent PV- examination:** Digital vaginal examination at intervals of less than four hours for routine assessment of active first stage of labour in low-risk women.

**Postpartum:** is period which begins immediately after the birth of the baby and extends up to six weeks (42 days) after birth.

### 4.9 Data Processing and Analysis

The data were checked for completeness and missing values. Then the coded data were entered to Epi Data version 3.1 and exported into SPSS version 23.0 for analysis. The data was presented by tables and charts. Frequency, mean and standard deviation was obtained for continuous variables and categorical variables were assessed by computing descriptive statistics and logistic regression. All variables were used in the Bi-variate logistic regression and variables with significant associations (p-value ≤0.25) were further considered for multi-variable logistic regressions to determine independent associations of each variable. Crude odds ratio and adjusted odds ratio (AOR) were analyzed with a 95% confidence interval (CI) and p-value ≤0.05 was considered a statistically significant association. Hosmer and lemeshow test were checked and final model was fitted (P = 0.418). Multi-collinearity was checked by using variance inflation factor (VIF < 3.3 and S.E < 0.37).

### 4.10 Data quality control or assurance management

Pretest was done on 5% (21) of a sample size in Bedele hospital to ensure internal consistency of the instruments. After collecting the pretest data, each individual questionnaire response was checked for any potential problem related to the instrument, such as any difficult question which

is not satisfy the respondent psychology, not understandable or unclear question to reply. Finally, corrective measures were taken.

Both data collectors and supervisors were trained for two days on objective of study and techniques of data collection as well on ethical issues. Supervisors checked the completeness and consistencies of questionnaires filled by the data collectors to ensure the quality of the data daily. The principal investigator was evaluated the data before data entry to verify the completeness of the collected data.

### 4.11 Ethical Consideration

Ethical clearance to start the study was obtained from Institutional Review Board Committee of Jimma University (IRB)**.** Then the permission letter was written to each public hospital in Jimma zone for data collection. Verbal and written informed consent was obtained from participants after a detailed explanation on the purpose and benefit of the study right before the individual data collection. The participants are informed that their failure to participate in the study was not result in any form of penalty and assured that they can quit from the study any at time they want.

### 4.12 Dissemination of plan

The results of the study will be presented to the public defense and following which the final edition (revision) will be disseminated to school of Nursing and Midwifery, institute of Health, Jimma University. Dissemination of the result will also be made to the hospitals in Jimma zone and Jimma zone health office through hard/ or softcopies if found appropriate. Also, manuscript(s) will get submitted for publication in peer reviewed scientific reputable journals for publication and will also be presented in scientific conferences.

# CHAPTER FIVE: RESULTS

## 5.1 Socio-demographic and economic characteristics

A total of 406 postpartum women were interviewed out of 422, making the response rate of 96.2 percent. The mean age of respondents was 26.2 (±5.2) years. 132 (32.5%) women were in the age group of 20-24 years. More than half 214(52.7%) of the mothers had no formal education, 337 (83%) of women were housewife and average monthly income of the family in the study area was range between 1001- 2000. Majority of the respondents 388 (95.6%) were married and 239 (58.9%) were rural resident.

**Table 1: Socio demographic characteristics of postpartum women admitted to public hospitals of Jimma zone, Oromia region, southwest Ethiopia, April – May 15, 2019.**

| Variables | Categories | Frequency (N= 406) | Percent |
|---|---|---|---|
| **Age** | 15-19 | 23 | 5.7 |
| | 20-24 | 132 | 32.5 |
| | 25-29 | 122 | 30.0 |
| | 30-34 | 81 | 20.0 |
| | 35+ | 48 | 11.8 |
| **Educational level** | no formal education | 214 | 52.7 |
| | 1-8 | 126 | 31.0 |
| | 9-12 | 40 | 9.9 |
| | 12 and more | 26 | 6.4 |
| **Occupations** | house-wife | 337 | 83.0 |
| | self-employed | 40 | 9.9 |
| | gov't-employed | 19 | 4.7 |
| | others* | 10 | 2.5 |
| **Marital status** | Single | 6 | 1.5 |
| | married | 388 | 95.6 |
| | widowed | 6 | 1.5 |
| | divorced | 6 | 1.5 |
| **Place of residence** | Rural | 239 | 58.9 |
| | Urban | 167 | 41.1 |
| **Average monthly income of family** | < 1000 | 99 | 24.4 |
| | 1001-2000 | 205 | 50.5 |
| | 2001-3000 | 64 | 15.8 |
| | 3000+ | 38 | 9.4 |
| | Total | 406 | 100.0 |

* = merchant, farmer and student.

### 5.2 Obstetrics characteristics of women

One hundred fifty eight (38.9%) of women were multipara and majority 382 (94.1%) of them had ANC follow up. More than ninety percent 371 (91.4%) of mothers gave birth at term while only 28 (6.9%) had preterm baby. Regarding place of birth, wide number 381 (93.8%) of women gave birth at health institution while 25 (6.2%) gave birth at home. As to duration of labor, more than three fourth 343 (84.5%) of women were on labor for less than twenty-four hours while 63 (15.5%) were on labor for more than twenty-four hours. Of women interviewed 37(9.1%) of them were experienced premature rupture of membranes, 13(3.2%) retained placenta and 26 (6.4%) developed postpartum hemorrhage.

**Table 2: Obstetrics profile of postpartum women admitted to public hospitals of Jimma zone, Oromia region, southwest Ethiopia, April – May 15, 2019.**

| Variables | Responses | Frequency (N=406) | Percentage (%) |
|---|---|---|---|
| **Parity** | Primi-para | 133 | 32.8 |
| | Multi-para | 158 | 38.9 |
| | Grand multi-para | 115 | 28.3 |
| **Antenatal care follow up** | Yes | 382 | 94.1 |
| | No | 24 | 5.9 |
| **Gestational age** | 28-37 | 28 | 6.9 |
| | 37-42 | 371 | 91.4 |
| | 42+ | 7 | 1.7 |
| **Place of delivery** | Home | 25 | 6.2 |
| | Health center | 47 | 11.6 |
| | Hospital | 334 | 82.3 |
| **Mode of delivery** | Vaginal delivery | 147 | 36.2 |
| | Caesarean delivery | 245 | 60.3 |
| | Instrumental delivery | 14 | 3.4 |
| **Duration of labor** | < 24hrs | 343 | 84.5 |
| | ≥ 24hrs | 63 | 15.5 |
| **Vaginal examinations** | Every 4hrs | 182 | 44.8 |
| | Below 4hrs | 155 | 38.2 |
| | don't know | 43 | 10.6 |
| | None | 26 | 6.4 |
| **PROM** | Yes | 37 | 9.1 |
| | No | 369 | 90.9 |
| **Retained placenta** | Yes | 13 | 3.2 |
| | No | 393 | 96.8 |
| **Genital suture** | Yes | 59 | 14.5 |
| | No | 347 | 85.5 |
| **Postpartum hemorrhage** | Yes | 26 | 6.4 |
| | No | 380 | 93.6 |
| **Birth attendant (N=400)** | Non Skilled BA | 23 | 5.8 |
| | Skilled BA | 377 | 94.3 |

### 5.3 Medical characteristics of women

Sixty-five (16%), 13(3.2%) of women were developed pregnancy induced hypertension disorder and urinary tract infection respectively. Majority 364(89.7%) of women were non-reactive for HIV infection. However, less than one percent of women were infected with HIV. More than sixty percent 267 (65.8%) of women`s hemoglobin level was >11g/dl while only 73(18%) women had hemoglobin level <11g/dl before delivery. Three hundred thrifty nines (83.5%) of women had normal body mass index and 59 (14.5%) were underweight.

**Table 3: Medical characteristics of postpartum women admitted to Jimma zone public hospitals, Oromia region, southwest Ethiopia, April – May 15, 2019.**

| Variables | Responses | Frequency (N=406) | Percentage (%) |
|---|---|---|---|
| **PI Hypertension** | Yes | 66 | 16.3 |
| | No | 340 | 83.7 |
| **Type of PI hypertension** | mild-preeclampsia | 24 | 36.4 |
| | sever-preeclapsia | 28 | 42.4 |
| | Eclampsia | 13 | 19.7 |
| | chronic-hypertension | 1 | 1.5 |
| | Total | 66 | 100.0 |
| **urinary tract infection** | Yes | 13 | 3.2 |
| | No | 393 | 96.8 |
| **sexual transmitted infections** | Yes | 15 | 3.7 |
| | No | 384 | 94.6 |
| | Unknown | 7 | 1.7 |
| **HIV status** | Negative | 364 | 89.7 |
| | Positive | 2 | 0.5 |
| | Unknown | 40 | 9.9 |
| **Hgb level before delivery** | > 11g/dl | 267 | 65.8 |
| | < 11g/dl | 73 | 18.0 |
| | Unknown | 66 | 16.3 |
| **Postpartum Hgb level** | > 11g/dl | 263 | 64.8 |
| | < 11g/dl | 143 | 35.2 |
| **Body mass index** | Underweight | 59 | 14.5 |
| | Normal | 339 | 83.5 |
| | Obese | 8 | 2.0 |

### 5.4 Health facility related factors

Three hundred thirty-eight (83.3%) of women had access to transportation. More than three fourth 378 (77.2%) of women observed person assisting them used gloves and 90 (18.6%) were washed hand. Majority 257 (63.3%) of postpartum women were more 10km far from hospital.

**Table 4: Health facility related characteristics of postpartum women admitted to Jimma zone public hospitals, Oromia region, southwest Ethiopia, April – May 15, 2019.**

| Variables | Responses | Frequency (N=406) | Percentage (%) |
|---|---|---|---|
| **Access of transportation** | Yes | 338 | 83.3 |
| | No | 68 | 16.7 |
| **hygienic practice** | Washed hand | 90 | 18.6 |
| | Used gloves | 378 | 77.2 |
| | don't know | 15 | 3.1 |
| | Total | 483 | 100.0 |
| **bed and linen cleaned** | Yes | 353 | 86.9 |
| | No | 53 | 13.1 |
| **referred from other** | Yes | 321 | 79.1 |
| **health facility** | No | 85 | 20.9 |
| **Distance from hospital** | ≤ 10 Km | 149 | 36.7 |
| | > 10 Km | 257 | 63.3 |
| **Length of hospital stay** | 1-3 | 282 | 69.5 |
| **( in days)** | 4-10 | 120 | 29.6 |
| | 10+ | 4 | 1.0 |
| | Total | 406 | 100.0 |

**Magnitude of puerperal sepsis**

Based on the samples which were assessed by physicians and midwives when those women who had symptoms of pelvic pain, fever (body temperature of 38.5°C or higher), offensive vaginal discharge and delay in the reduction of the uterus size during postpartum period. Among the total number of 406 samples 48 (11.82%) were developed puerperal sepsis.

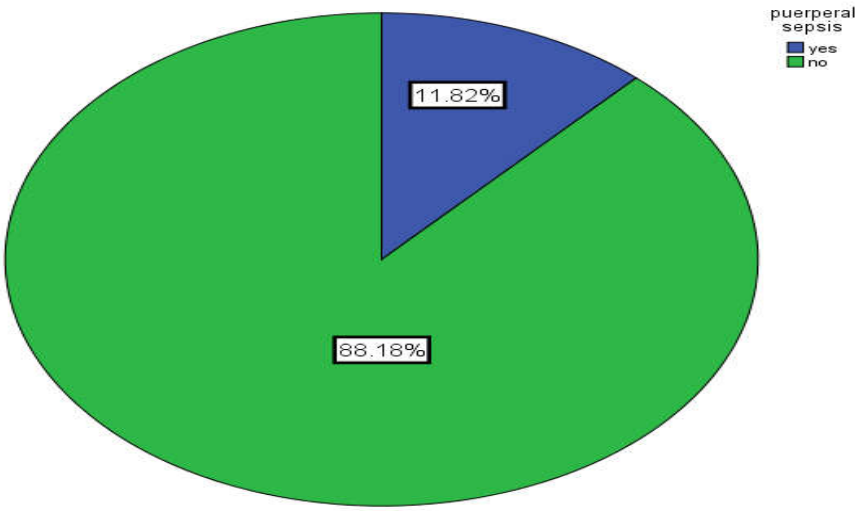


**Figure 1: Distribution of puerperal sepsis among postpartum women admitted to Jimma zone public hospitals, Oromia region, southwest Ethiopia, April – May 15, 2019.**

Ninety eight (27.8%) of women were complain fever, 65 (18.5%) abdominal pain and 51 (12.6%) were developed body temperature greater than $38.5^0$C.

**Table 5: Distribution of Sign and symptoms of puerperal sepsis among postpartum women admitted to public hospitals of Jimma zone, Oromia region, southwest Ethiopia, April – May 15, 2019.**

| Variables | Responses | Frequency (N=406) | Percentage (%) |
|---|---|---|---|
| **Body temperature** | < 38.5 $^0$C | 355 | 87.4 |
| | ≥38.5 $^0$C | 51 | 12.6 |
| **Sign and symptoms (352)** | Fever | 98 | 27.8 |
| | vaginal discharge | 18 | 5.1 |
| | Abdominal pain | 65 | 18.5 |
| | Delayed uterine size | 34 | 9.7 |
| | Headache | 74 | 21 |
| | Malaise and fatigue | 63 | 17.9 |

**Factors associated with puerperal sepsis**

Both Bi-variate and multivariable logistic regression analyses were made to identify the significant associated factors of puerperal sepsis.

The Bi-variate analysis result revealed that socio-demographic variables such as residence and educational status; obstetric profile variables such as parity, antenatal care (ANC) follow up, place of delivery, mode of delivery, premature rupture of membrane, duration of labour, birth attendant, retained placenta, genital tear or episiotomy, postpartum hemorrhage, per vaginal examinations, hemoglobin level before and after delivery; health facility related variable distance from hospital and access to transportation were significantly associated with puerperal sepsis.

The above mentioned significant variables and those with p-value less than or equal to 0.25 in the crude analysis were again entered in to multivariable logistic regression model to control for confounding.

The variables with p-value less than 0.05 in multivariable logistic regression analysis were taken as significant associated factors of puerperal and the rest were refuted.

Variables which significantly associated with puerperal sepsis in the final model include: parity, place of delivery, premature rupture of membranes, episiotomy or genital tear and duration of labour **(See Table 6).**

**Table 6: Associated factors of puerperal sepsis on multi-variable logistic regression analysis among postpartum women admitted to public hospitals of Jimma zone, Oromia region, southwest Ethiopia, April – May 15, 2019.**

| Variables | Puerperal sepsis | | COR (95% CI) | AOR (95% CI) |
|---|---|---|---|---|
| | Yes | No | | |
| | No. (%) | No. (%) | | |
| **Parity** | | | | |
| Primipara | 11 (8.3%) | 122 (91.7%) | 1.0 | 1.0 |
| Multipara | 13 (8.2%) | 145(91.8%) | 0.994(0.43 -2.29) | 1.268 (0.46- 3.495) |
| Grandmultipara | 24 (20.8%) | 91 (79.1%) | 2.925(1.36 -6.27) | **3.795 (1.339-10.75)**** |
| **Place of delivery** | | | | |
| Home | 7 (28%) | 18 (72%) | 4.807(1.83-12.59) | **5.721 (1.835-17.837)*** |
| Health center | 16 (34%) | 31 (66%) | 6.379(3.08-13.21) | **4.220 (1.817-9.804)*** |
| Hospital | 25 (7.5%) | 309(92.5%) | 1.0 | 1.0 |
| **Premature rupture of the membranes** | | | | |
| Yes | 15 (40.5%) | 22 (59.5%) | 6.942(3.28-14.65) | **4.842 (2.004-11.697)*** |
| No | 33 (8.9%) | 336 (91.1%) | 1.0 | 1.0 |
| **Genital suture** | | | | |
| Yes | 14 (23.7%) | 45 (76.3%) | 2.864(1.43-5.74) | **4.066 (1.535-10.770)*** |
| No | 34 (9.8%) | 313 (90.2%) | 1.0 | 1.0 |
| **Duration of labor** | | | | |
| ≥ 24hrs | 17 (27%) | 46 (73%) | 3.719(1.24-5.347) | **2.662 (1.195-5.929)**** |
| < 24hrs | 31 (9%) | 312 (90.9%) | 1.0 | 1.0 |

*** P value < 0.01 and ** P value < 0.05**

On multivariable logistic regression, grand multipara postpartum women were 3.8 times more likely to develop puerperal sepsis than primiparous women [AOR= 3.795, 95% (CI, 1.339-10.753)].

Place of delivery was a significantly associated with puerperal sepsis. Women who delivered at home were 5.7 times more likely to develop puerperal sepsis compared to women who gave their birth in hospital [AOR = 5.721, 95% (CI: 1.835-17.837)]. Again, women gave birth in health centers were 4.2 times more likely to develop puerperal sepsis compared to women who gave their birth in hospital [AOR = 4.220, 95% (CI: 1.817-9.804)].

The study assessed that puerperal sepsis was 4.8 times more likely among women who experienced premature rupture of membranes than who did not experienced premature rupture of membranes [AOR= 4.842, 95% (CI, 2.004-11.697)].

Women who had episiotomy or genital suture were 4 times more likely to develop puerperal sepsis compared to those who had no episiotomy or genital suture [AOR= 4.066, 95% (CI: 1.535-10.770)].

There was also significant association between duration of labour and puerperal sepsis. Mothers who were on labour for more than 24hrs were 2.6 times more likely to develop puerperal sepsis than mothers who were on labour for less than 24hrs [AOR= 2.662, 95% (CI, 1.195-5.929)].

## CHAPTER SIX: DISCUSSION

In this study 11.8% of postpartum women were developed puerperal sepsis. This is somewhat similar with cross sectional study conducted in Rwanda University Teaching Hospital of Kigali and Pumwani, Kenya stated that 15% and 12.2% of postpartum women were with diagnosed puerperal sepsis respectively (26, 29). But it is higher compared to studies conducted in California, United States of America, Pakistan, Nigeria and Uganda which shows that 0.1%, 3.89%, 0.78%, 5% of postpartum women were developed puerperal sepsis respectively (12, 23, 27, 28). The discrepancy may be due to difference in: socio economics status, standards of obstetrics care, study period and sample size. Again it is higher than Study conducted in Dessie referral hospital, Ethiopia which stated that 5.7% women were developed puerperal sepsis during childbirth and post-partum period (19)**.** The difference may be due to the study conducted in Dessie referral hospital; Ethiopia was included women in immediate postnatal (less than 24hrs after delivery) which are more of undiagnosed.

The study found that parity was significantly associated with puerperal sepsis .This means that those grand multipara postpartum women were more likely to develop puerperal sepsis than primiparous women. The finding is similar with the study conducted in Scotland (30). But it contradicts with the study conducted in California, United States of America stated that there were no significant differences in parity (23). The discrepancy may be due to socioeconomic difference.

Duration of labour was significantly associated with puerperal sepsis. Mothers who were on labour for more than 24hrs were more likely to develop puerperal sepsis than mothers who were on labour for less than 24hrs. This finding is similar with the study conducted in Dessie referral hospital, West Shoa zone, Ethiopia, Pumwani hospital, Kenya and Ayub, Pakistan (19, 25, 29, 32). This may be because prolonged labour leads women's to frequent per vaginal examinations, perineal tear or episiotomy and exposed them for ascending infection.

The study assessed that puerperal sepsis was more likely among women who experienced premature rupture of membranes than who did not experienced premature rupture of membranes. But population based study conducted in the USA stated that premature rupture of membranes were less likely to occur in those who eventually developed sepsis (24). The difference may be due to this study was facility based.

Home delivery was significantly associated with puerperal sepsis. Women who delivered at home were more likely to develop puerperal sepsis compared to women who gave their birth in hospital. This finding agreed with study conducted in Dessie, Ethiopia and Maiduguri, Nigeria (19, 28). Also in line with study conducted in Ayub, Pakistan, the major proportion of puerperal sepsis is from home deliveries (73.9%) (25).This may be due to in case of home delivery poor hygiene practice and unclean materials used.

Women who had episiotomy or genital suture were more likely to develop puerperal sepsis compared to those who had no episiotomy or genital suture. Supported by study conducted in Maiduguri, Nigeria shows that perineal tear or episiotomy was risk factor for development of puerperal sepsis (28). This may be due to episiotomy done or perineal tear occurred because of prolonged and obstructed labour.

**Limitations of the study**

Cause and effect cannot be ascertained since it is a cross sectional study.

# CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

## CONCLUSION

The magnitude of puerperal sepsis was high compared to the studies (12, 19, 23, 27, 28). Grand multi-parity, having prolonged labour (labour > 24hrs), delivery at home and health center, premature rupture of membranes (PROM) and episiotomy or genital tear were significantly associated with puerperal sepsis.

## RECOMMENDATIONS

**Based on the finding of study the following recommendations are forwarded:**

**To Oromia regional health bureau and Jimma zone health department**

- ✓ Should work to decreases magnitude of puerperal sepsis by increasing institutional delivery.
- ✓ Should work with community leaders and health extension worker to encourage women on labour as they should visit health facility earlier in order to reduce prolonged labour.

**To health care providers**

- ✓ ANC providers should use the opportunity to promote institutional delivery.
- ✓ Should properly utilize WHO partograph to prevent prolonged labour as well puerperal sepsis.
- ✓ Should prevent/avoid genital tear. And also practice aseptic techniques during episiotomy or genital tear repair.
- ✓ Should closely follow pregnant women experienced premature rupture of membranes.

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## Annex I: Information sheet and consent form

**Read the statements to the respondent**

My name is …… I am a data collector at study conducted on prevalence and associated factors of Puerperal Sepsis among postpartum women admitted in hospitals, Jimma zone, Oromia, Ethiopia.

**Purpose of the study:** the aim of this study is to assess factors associated with Puerperal Sepsis among postpartum women admitted in hospitals, jimma zone, Oromia, Ethiopia.

**Procedures:** Participation in this study will require that I ask you some questions in order asses the occurrence and associated factors of puerperal sepsis. You have the right to refuse participation in this study. You will get the same care and medical treatment whether you agree to participate in the study or not and your decision will not change the care you will receive from the clinic today or that you will get from any other time.

**Right to refusal or withdraw:** You may refuse to respond to any question and you may stop an interview at any time. You may also stop being in the study at any time without any consequences to the services you receive from this clinic or any other organization.

**Discomfort and/or Risks:** Some of the questions you will be asked may be embarrassing or make you uncomfortable. If this happens, you may refuse to answer these question if you so choose. You may also stop the interview at any time.

**Benefits:** There may be no direct benefit if you agree to participate in the study; however, the research findings will help to shape up future interventions that will potentially help improve health of women.

**Confidentiality:** All the interviews will be conducted privately within the clinic. Your name will not be recorded on the questionnaire. Filled questionnaires will be kept in a secure cabinet for safekeeping. In addition, it will not be revealed to anyone except the principal investigator. Privacy will be maintained in the whole process.

**Contacts Information**

If you have any question about your rights as a research volunteer, you may contact

**Mr. Fedhasaa Mamo**, mobile: +251-923691998 or e-mail: fedhasaamw@gmail.com

Jimma University, postgraduate class

**Consent form**

The above information above regarding my participation in the study has been made clear to me. I have been given a chance to ask questions which, have been answered to my satisfaction. I am voluntarily participating in this study. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will still get the same care and medical treatment whether I decide to leave the study or not and my decision will not change the care I will receive from the clinical today or that I will get from any other clinic at any other time.

**Name of participant**: _____ **Signature or Thumbprint: _____Date: _____**

## Annex II: English version Questionnaires

**Code = _____ MRN =_____**

**Section I: Socio-Economic and Demographic Characteristics**

**Instructions: encircle or fill the answers of following questions depend on the responses.**

| S. No. | Questions | Possible answers/choices | Skip to: |
|---|---|---|---|
| 1.1 | What is your age? | _____ | |
| 1.2 | What level of education did you completed? | 1. Can't read and write<br>2. Can read and write<br>3. 1-8<br>4. 9-12<br>5. $12^{+}$ | |
| 1.3 | What is your occupation? | 1. House wife<br>2. Self employed<br>3. Gov't employed<br>4. Others (specify) _____ | |
| 1.4 | What is your marital status? | 1. Single<br>2. married<br>3. Widowed<br>4. Divorced<br>5. Other (specify) _____ | |
| 1.5 | Place of residence | 1. Rural<br>2. Urban | |
| 1.6 | Monthly income of family (ETB) | _____ | |

**SECTION II: approach to diagnoses puerperal sepsis**

2.1 What is the body temperature of the woman during postpartum period? _____°C

2.2 Does she develop any of the following symptoms or sign? (tick all possible answers)

1. Fever – use back of your hand to appreciate the body temperature.
2. Offensive vaginal discharge
3. Lower abdominal pain
4. Delay in the size of uterus
5. Malaise and fatigue
6. Chills
7. Headache and poor appetite
8. Never suffered from any

2.3 If offensive vaginal discharge, what is the color of this discharge?

1. Clear and watery
2. White
3. Yellow or green

2.4 What is the medical diagnosis of the woman?

1. Puerperal sepsis
2. STI
3. AFI
4. Other specify _____

**Section III: Associated risk factors**

**A. Obstetric related factors**

| | | |
|---|---|---|
| 3.1 | What is the number of deliveries you had? | 1. one<br>2. two - three<br>3. four and greater |
| 3.2 | Did you have antennal care follow up before delivery? | 1. Yes<br>2. No |
| 3.3 | What was your Gestational age during last birth? | 1. 28- 37 weeks (Preterm)<br>2. 37- 42 weeks (Term)<br>3. $42^{+}$ weeks (Post term) |
| 3.4 | Where did you give your last birth? | 1. Home<br>2. Health center<br>3. Hospital |
| 3.5 | What was the mode of your last delivery? | 1. Spontaneous vaginal delivery<br>2. Assisted vaginal delivery<br>3. caesarean delivery<br>4. Instrumental delivery |
| 3.6 | What was the duration of labor in your last delivery? | 1. Less than 6 hrs<br>2. 6-24 hrs<br>3. ≥24 hrs |
| 3.7 | How many times vaginal examinations did you have before delivery? | 1. Within 4 hours _____<br>2. Within 8 hours _____<br>3. Within 12 hours _____<br>4. None<br>5. Don‘t know |
| 3.8 | Was the rapture of the membrane takes place one hour before initiation of labor? | 1. Yes<br>2. No |

| | | | |
|---|---|---|---|
| 3.9 | If yes, How long did the rapture of the membrane takes place before delivery? | _____ hrs | |
| 3.10 | Were you assisted during delivery? | 1. Yes<br>2. No | No→ 2.12 |
| 3.11 | Who assisted you? | 1. Family member<br>2. Traditional birth attendant<br>3. Skilled birth attendant<br>4. Other (specify) _____ | |
| 3.12 | Have you experienced fetal death for this delivery (IUFD)? | 1. Yes<br>2. No | |
| 3.13 | How long the placenta was retained after gave birth? | _____ in minutes | |
| 3.14 | Had you under gone genital suture due to genital laceration or episiotomy? | 1. Yes<br>2. No | |
| 3.15 | Did you take Prophylactic antibiotics during labor and delivery? **(PROM, CS and retained placenta)** | 1. Yes<br>2. No | |
| 3.16 | Were you diagnosed for chronic or pregnancy induced hypertension during last birth? | 1. Yes<br>2. No | |
| 3.17 | If yes, what type of PIH or hypertension you have experienced? **( confirm from card)** | 1. mild preeclampsia<br>2. severe preeclampsia<br>3. Eclampsia<br>4. chronic hypertension | |
| 3.18 | Did you face Postpartum hemorrhage during this birth? | 1. Yes<br>2. No | |

**B. maternal co morbidity conditions (review patient card)**

| | | |
|---|---|---|
| 3.19 | Had diagnosed for diabetes mellitus? | 1. Yes<br>2. No |
| 3.20 | If yes what type of DM? | 1. GDM<br>2. Pre-gestational DM |
| 3.21 | Does the woman develop UTI during labour and delivery? | 3. Yes<br>4. No |
| 3.22 | Did the women diagnosed for STI infection during pregnancy or postpartum? | 1. Yes<br>2. No<br>3. Unknown |
| 3.23 | What was the HIV status of mother? | 1. Negative<br>2. Positive<br>3. Unknown |
| 3.24 | The Hemoglobin level of the woman before delivery | 1. < 11 gm/dL<br>2. > 11 gm/dL<br>3. Unknown |
| 3.25 | The Hemoglobin level of the woman during post partum | 1. < 11 gm/dL<br>2. > 11 gm/dL<br>3. Unknown |
| 3.26 | Maternal nutritional status (BMI) | _____ |

**C. health facility related factors**

| | | |
|---|---|---|
| 3.27 | Do you have access of transportation to go to health facility? | 1. Yes<br>2. No |
| 3.28 | How far is your home from the hospital (in Kilometers)? | _____ |
| 3.29 | Have you seen or treated immediately after arrival to hospital during labor and delivery? | 1. Yes<br>2. No |
| 3.30 | What kind of hygienic practice did you observe from the person assisting you(tick all possible answers) | 1. Washed hands before assisting<br>2. Used gloves<br>3. None<br>4. Don‘t know |
| 3.31 | Was the bed and linen you used cleaned during labor and delivery? | 1. Yes<br>2. No |
| 3.32 | Did you referred from other health facility? | 1. Yes<br>2. No |
| 3.33 | How many days you stay in health hospital (in days) | _____ |

**Signature of the interviewer**

**Name ----------Signature ----------date----------**

**Supervisors/Researcher remark and signature**

**----------**

**----------**

**Name ----------Signature ----------date----------**

## Annex III: Gaaffilee Afaan Oromoo

**YUUNIVARSIITII JIMMAA**

**INISTITIYUUTII FAYYAA**

**MANA BARNOOTAA NURSIINGII FI MIIDWAAYIFERII**

**Waraqaa Odeeffannoo**

**himichaa warraa deebisaanif dubbisi**

Akkam jirtu? maqaan koo …… jedhama. Ani qorannoo " prevalence and associated factors of Puerperal Sepsis" jedhuu kan hospitaalota motummaa godinaa Jimmmaa naannoo Oromiyaa, Itoophiyaatti hadhoolii dahaani hospitaala cisaan irraatti qoraatamuuf raga sassaabadha.

**Kaayyoo qoraannicha**: kayyoon qorannoo kana waantoota puurpuri'al seepsisiif sabaaba ta'an adda baasuu fi hammaasa baruu ta'a.

**Hubaatii qorannichaa**: qorannoo kanas keessatti hirmaachuu keessaniif rakkiini isiniraa gahuu waa tokkoolee hin jiru. Yeroo barbaadannittis adda kutuu dandeessuu. Qoranichiis turtii daqiiqa soddomaa caala hin fudhaatu.

fayyidaa: fayyidaa kallaatti argaachuu bataanis qorannoo kana keessaatti hirmaachuu keessaan haala rakkichaa hubaachuu fi akkaasummas fayyaa hadhoolii fooyyesuuf gahe ol ana qaba.

**Mirgaa gaafatamtoota:** isinis qorannoo kanaaf filataamtanii jirtuu. Gaaffileen qoranoo kanaa dhimmootaa dhunfaa kaan ilaallatan waan ta'aniif qorannoo kana keessaatti hirmaachuun fedhii irraatti kan hundaa'e ta'a. kaanafis hirmaachuu fi dhiisuu irraatti mirgi keessaan ni kabajaamaa dha. Haata'u malee galmaa ga'umsaa kaayyoo qorannoo kanaa fi fooyya'insa tajaajila fayyaa haadholii fooyyesuuf jecha hirmaana keessan kabajaan isiin gaafatna. Deebbiin keessaan hundii iccittiin kan qabamuu ta'uu isaa ni mirkaneessina. Kaanafis maqaan keessaa waraqaa gaaffii irraatti hin baarra'u.

**Odeeffannoo gaggeessaa qorannichaa**

**Qorannoo kana irraatti gaaffii yoo qabataan gaggeessaa qorannoo kanaa gafadhaa.**

**Obboo. Fedhasaa Maammoo, bilbiila: +251-923691998 or e-mail: fedhasaamw@gmail.com**

**Jimma University, postgraduate class**

**Foormii Walii galtee**

Akkaan qorannoo kanaarratti hirmaadhuuf gaaffii armaan oliitti naa dhiyaatef kaayyoo fi bu'aan qorannichaa waan naa galeef fedhii koon hirmaachuuf murteeseen jira. Yeroo barbaadeetis addaa kutuu akkaan danda'uu akkasumaas yaalii koo irraati rakkoo akkaa hin umnee hubaadheen jira. Kaanafuu waraqaa walii galtee armaam gadi irraatti mallatteessudhan; qamaa qorannichaa ta'uu koo nan mirkaaneesaa.

Itti fufuu nan danda'aa? a. Eeyyee b. Lakkii

Maqaa gaafataama _____mallaattoo _____ Guyyaa _____

**Kodii = _____ LGM = _____**

**kutaa 1: haala hawaasummaa fi diinagdee gaafatamaa**

**gaaffilee armaan gadii deebbii isaa ittii mari ykn bakkaa duwwaa guuti?**

| Tar. | Gaaffilee | Deebii/filannoo | Ce'i |
|---|---|---|---|
| 1.1 | Umurii | _____ | |
| 1.2 | Sadarkaa barnoota | 1. Barnoota idilee hin baraanne<br>2. Kutaa 1-8<br>3. Kuaa 9-12<br>4. 12+ | |
| 1.3 | hojii | 1. Hadhaa warraa<br>2. Hojii dhunfa<br>3. Hojaata mootummaa<br>4. Kan biraa (specify) _____ | |
| 1.4 | Haala ga'ilaa | 1. Hin heerumnee<br>2. heerumee<br>3. abbaan mana koo du'e<br>4. waalhiknee | |
| 1.5 | Iddoo jirenyaa | 1. Badiyyaa<br>2. magaala | |
| 1.6 | Gaali maatii kan ji'a (ETB) | _____ | |

**Kutaa 2: approach to diagnoses puerperal sepsis**

| | | |
|---|---|---|
| 2.1 | Ho'insaa qamaa da'umsaa booda | _____°C |
| 2.2 | Rakkoolee armaan gadii keessaa isaa kaamtu sii muudate? Deebii tokkoo ol ni t a'a. | 1. Qamaa hodhisuu<br>2. Dhangaala folli qabuu gara qamaa hormaata ba'u.<br>3. Dhuukkubii gara gadii<br>4. Gadaamesii bakkaa isaati deebii'uf haarkifachuu<br>5. Homtuu naa guunamnee |
| 2.3 | Yoo dhangaala folli qabuu gara qamaa hormaata ba'u ta'ee halluu kaam? | 1. Qulquullu fi bishaanii<br>2. adii<br>3. kelloo ykn magaarisaa |
| 2.4 | Odeefannoo armaan olii irraati hundaa'un dhukkubnii ishee maali? | 1. "Puurpuril seepsiisi"<br>2. Dhukkuboota saalqunaantii<br>3. AFI<br>4. Kan biroo _____ |

**Kutaa 3: associated risk factors**

**A. waantotaa ulfaa fi da'umsaan waalqabaatan**

| | | |
|---|---|---|
| 3.1 | Yeroo meqaa deese? | 1. Tokkoo<br>2. lama-sadii'i<br>3. afuurif isa ol |
| 3.2 | Hoordofii ulfaa qabdaa ture? | 1. eyyeen<br>2. lakkii |
| 3.3 | Ulfaa ji'aa meeqa deese | 1. 28- 37 weeks<br>2. 37- 42 weeks<br>3. $42^{+}$ weeks |
| 3.4 | Da'imaa ammaa eessaati deese? | 1. manatti<br>2. buufataaa fayyaa<br>3. hoospitaala |
| 3.5 | Maalin/akkamiin deese? | 1. gaadameessaan<br>2. ogeessaa gargaaramee<br>3. meeshaan gargaaramee<br>4. opiireshiiniin |
| 3.6 | Ciininsuun ammaam siirraa turee? | 1. Sa'ati 6 gadii<br>2. Sa'atii 6-24<br>3. Sa'atii 24 ol |
| 3.7 | Da'umsaa duraa yeroo meqaa akkaa gadaamessii kee banaa ta'e ilaalamtee? | 1. Sa'atii 4n _____<br>2. Sa'atii 8n _____<br>3. Sa'atii 12n _____<br>4. hin ilaalamnee<br>5. hin yaadadhu |
| 3.8 | Bishaan mataa dhangalaa'e ciininsuun sa'aatti meqaa booda sii egaalee? | 1. Lakkii<br>2. eyyeen |
| 3.9 | Eyyeen yoo ta'ee hangaa da'umsaatii sa'atii meqaa turtee? | _____ |

| | | | |
|---|---|---|---|
| 3.10 | Yeroo da'umsaa gargaaramteeta? | 1. Eyyeen<br>2. Lakkii | lakkii →<br>2.12 |
| 3.11 | Enyuutu sii gargaaree? | 1. Miisensaa maatii<br>2. Desiistu adaa<br>3. Ogeesaa fayyaa<br>4. Kan biroo _____ | |
| 3.12 | Da'uumsaa kaanarattii lubbuun darbuu da'iimaa sii mudaate? | 1. Eyyeen<br>2. lakkii | |
| 3.13 | Obaatiin daqiqaa meqaa booda ba'e? | _____ | |
| 3.14 | Istiichii dhan yeroo dessuu qamnii walhormaata kee hodhaamee? | 1. Eyyeen<br>2. Lakkii | |
| 3.15 | "Prophylactic antibiotics" yeroo ciniinsuu fi da'umsaa sii kenname? | 1. Eyyeen<br>2. lakkii | |
| 3.16 | Deesuun dhiibbaa dhigaa akkaa qabduu addaa baafamee? | 1. Lakkii<br>2. lakkii | |
| 3.17 | Yoo addaa baafamee ta'e gosaa dhiibbaa dhigaa isaa kaam? | 1. mild preeclampsia<br>2. severe preeclampsia<br>3. Eclampsia<br>4. chronic hypertension | |
| 3.18 | Dhangaalaa'u dhiiga da'umsaa booda sii mudaatee? | 1. Eyyeen<br>2. Laakkii | |

**B. haalota fayyaa hadhaa waliin walqabaatan**

| | | |
|---|---|---|
| 3.19 | Dhiibee suukaraa qabachuun ishee addaa baafamee? | 1. Eyyeen<br>2. lakkii |
| 3.20 | Yoo eyyeen ta'e dhiibbee sukaara gosaa kaam? | 1. GDM<br>2. Pre-gestational |
| 3.21 | Dhukuubaa ujumoo finchaanin waalqabatu qabdii (UTI)? | 1. Eyyeen<br>2. Laakkii |
| 3.22 | Dhukuuboota saalqumaantii daddaarbaan ilaalchisee deesuun | 1. Biliisaa<br>2. pozotivii<br>3. hinbeekamuu |
| 3.23 | Haali dhukkubaa HIV haadha maalidha | 1. Biliisaa<br>2. pozotivii<br>3. hinbeekamuu |
| 3.24 | The Hemoglobin level da'umsaa duraa? | 1. < 11 gm/dL<br>2. > 11 gm/dL<br>3. Unknown |
| 3.25 | The Hemoglobin level da'umsaa booda? | 1. < 11 gm/dL<br>2. > 11 gm/dL<br>3. Unknown |
| 3.26 | haala sirnaa nyaata haadha (BMI) | _____ |

**C. haalota taajajilaa fayyaa waliin waqabaatan**

| | | |
|---|---|---|
| 3.27 | Gara dhaabbilee fayyaati deemuf taajajilii konkolaata jira? | 1. Eyyeen<br>2. lakkii |
| 3.28 | Hoospitaala irraa manii keessaan ammaam fagaata (in Kilometers)? | _____ |
| 3.29 | Baatalaa buufataa/hospitaala gesseen ilaalamtee? | 1. Eyyeen<br>2. lakkii |
| 3.30 | Haala quulqullinaa eguu ogeeyyii ilaalalte (tick all possible answers) | 1. Gaargarsaa duraa harkaa dhiqachuu<br>2. Giilaavii fayyaadamuu<br>3. homaa<br>4. hin beeku |
| 3.31 | Sireen fi asoolaan yeroo da'umsaa irraa ciistee qulquulluu ture? | 1. Eyyeen<br>2. Lakkii |
| 3.32 | Garaa biraatii rifaar taatee? | 1. Eyyeen<br>2. Laakki |
| 3.33 | Tuurtii hospitaala keessaa (guyyaadhan) | _____ |

**Maqaa if mallaatto gaafataa**

**maqaa ---------- mallattoo ---------- guyyaa ----------**

**yaada fi mallaattoo suuparvayzaara ----------**

**----------**

**Maqaa ---------- Mallaattoo ---------- Guyyaa----------**

## DECLARATION

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

Name: Fedhasa Mamo (BSc.)

Signature: _____

Name of the institution: Jimma University

Date of submission: _____

This thesis has been submitted for examination with my approval as University advisor

Name of the first advisor: Mr. Ayanos Taye (BSc, MSc, Ass,t Prof., PhD fellow)

Signature _____ Date _____

Name of the second advisor: Mrs. Enatfenta Sewmehone (BSc, MSc)

Signature _____ Date _____

Approval of examiners

Name of the internal examiner: Mr. Bekana Fekecha (BSc, MSc, Ass,t Prof., PhD fellow)

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