PHARMA COLLEGE SCHOOL OF GRADUATE

STUDIES, HAWASSA CAMPUS

MAGNITUDE OF PRE-ECLAMPSIA AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN WHO ATTEND ANC AT SHASHAMANE COMPREHENSIVE SPECIALIZED AND MELKA ODA GENERAL HOSPITALS

MPH THESIS

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HAWASSA, ETHIOPIA

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A THESIS SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, COLLEGE OF MEDICINE AND HEALTH SCIENCES, SCHOOL OF GRADUATE STUDIES, HAWASSA UNIVERSITYIN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF PUBLIC HEALTH

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HAWASSA, ETHIOPIA

DECLARATION

I hereby declare that this MPH thesis is my own original work and has not been presented for a degree in any other university, and all sources of material used for this thesis proposal have been duly acknowledged.

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

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ACRONYMS AND ABBREVIATION

ART	Assisted reproductive technologies
MOGH	Melka Oda General Hospital
Ca	Calcium
REC	Research Ethics Committee
SCSH	Shashemane Compressive Specialized Hospital
PE	Pre-Eclampsia
Obs	Obstetrics
Gyn	Gynecology
WHO	World Health Organization
HDP	Hypertensive Disorder of Pregnancy
SBP	Systolic Blood Pressure
DBP	Diastolic Blood Pressure
SLE	Systemic lupus Erythematosus
HTN	Hypertension
CLIP	Community Level Interventions for Pre-eclampsia
IV	Independent Variables
DV	Dependent Variable
DM	Diabetic Mellitus
COR	Crude Odds Ratio
AOR	Adjusted Odds Ratio
CI	Confidence Interval
FIGO	International Federation of Gynecology and Obstetrics

SUMMARY

Background: Despite the high burden of disease, pre-eclampsia remains poorly studied in low and middle-income countries. Pre-eclampsia is the most common medical problem encountered in pregnancy and is a leading cause of perinatal and maternal morbidity and mortality. It has been increasing and linked to multiple factors that makes prevention of the disease a continuous challenge.

Objective: To determine the magnitude of pre-eclampsia and its associated factors among pregnant women above 20 weeks of gestation who attend Ante Natal Care in Shashemane Comprehensive Specialized and Melka Oda General Hospitals.

Methods: A facility based cross-sectional study was employed among pregnant women above 20 weeks from July 11 – September 9, 2021. Systematic random Sampling technique was employed. Data was collected by trained data collectors with structured questionnaire. The data was entered by Epidata and it was exported to SPSS.

The Descriptive statistics, mean, median and standard deviation or to summarize the continuous data accordingly. Further, Tables, figures and different interactive charts were used to present the data. Bi-variable and multi-variable logistic regression model were used to assess associated factors of pre-eclampsia.

Results: In the study area, the prevalence of pre-eclampsia was observed to be 9.02%. Age of women [AOR 5.775(95% CI; 1.797,18.560)]; BMI [AOR: 2.97; 95% CI, 1.020,8.660)]. ANC follow up [[AOR; 4.580; 95% CI;1.538,13.635)]; Previous history of PE [AOR: 4.358; 95% (CI;1.434, 13.251)], Family history of PE [AOR; 8.679 95% (CI; 2.680,28.102)] were associated factors of PE.

Conclusion: - Age of women, BMI, Previous ANC, Previous history of preeclampsia, family history of PE was associated factors of pre-eclampsia. this finding suggests that health care providers and other stakeholders should use these for the timely identification and management of pre-eclampsia by regular antenatal monitoring and careful follow-up

Keywords, Pre-eclampsia, pregnant women, Shashemene,

1. INTRODUCTION

1.1. Background

Pre-eclampsia is defined as a systolic blood pressure ≥140 mm Hg and/or diastolic blood pressure ≥90 mm Hg on at least two occasions measured 4 hours apart in previously normotensive women (1). Although the cause of preeclampsia remains unclear, several clinical risk factors have been described and include: - advanced maternal age; multiple pregnancies; intrauterine fetal growth restriction; previous history of PE; short and long inter pregnancy interval; use of assisted reproductive technologies; autoimmune diseases such as systemic lupus erythematous (2). Other risk factors associated to PE are: - Family history of PE, diabetes mellitus, pre-existing chronic hypertension, renal disease and null parity (3).

Pre-eclampsia is a multisystem disorder that typically affects 2%–5% of pregnant women and is one of the leading causes of maternal and perinatal morbidity and mortality, especially when the condition is of early onset (3). Incidence of pre-eclampsia is 7 times higher in low- and middle-income countries than that of high-income countries and the risk of a woman in a low-income country dying of pre-eclampsia is 300 times that of a woman in a high-income country (4). In Ethiopia pre-eclampsia related deaths appear to be increasing and linked to multiple factors, which makes prevention of the disease a continuous challenge (5).

While there is no known cure for preeclampsia other than delivery; the majority of cases with pre-eclampsia will resolve up on delivery of the fetus and placenta (6, 7). Magnesium Sulfate is used for the treatment of pre-eclampsia (6). Betamethasone remains the gold standard treatment at a dosage of two injections of 12 mg, 24 hours per day; to reduces the risk of hyaline membrane disease mainly in pre-term baby (7). The WHO recommends supplementation with 1·5 to 2·0 g of calcium daily from 20 weeks of gestation for the prevention of pre-eclampsia among all pregnant women living in areas with low dietary calcium intake, particularly for those at higher risk of pre-eclampsia (8).

Other study also shows women identified at high risk should receive low-dose aspirin or calcium supplementation at 11–14 weeks of gestation for preventing preeclampsia, intrauterine growth restriction, preterm birth and improve outcomes (9,10); but need further evidence before

recommendation for use (10). Even though pre-eclampsia contributes to 11% of the maternal death in Ethiopia; there are few studies done on pre-eclampsia in this country (11). By this study we assessed the magnitude and associated factors of preeclampsia among pregnant women who attends ANC at Shashemene Comprehensive Specialized and Melka Oda General hospitals in Shashamane, Ethiopia.

1.2. Statement of the problem

Pre-eclampsia is major contributor to maternal and neonatal deaths in developing countries, associated with 10-15% of direct maternal deaths and nearly a quarter of stillbirths and newborn deaths (6). In pregnant women alone, the prevalence of preeclampsia reaches up to 16.7% in developing countries (12, 13).

The problem is confounded by the continued mystery of the etiology and the unpredictable nature of the disease (14). PE is an age-long obstetric challenge that has been researched for decades yet remains unresolved (15). The disease has implications for the mother beyond pregnancy and has long-term effects on child health (16). Pre-eclampsia is a complication of pregnancy, which, in severe case progress to red blood cell breakdown, a low blood platelet count, impaired liver function, swelling, shortness of breath due to fluid in the lungs, visual disturbances; severe epigastric or right upper quadrant pain; impaired renal function (17,18).

Factors which contributes to pre-eclampsia are; multiple pregnancies; intrauterine fetal growth restriction, nulli parity; previous history of PE; short and long inter pregnancy interval; family history of PE; black race; diabetes mellitus; pre-existing chronic hypertension; renal disease and systemic lupus erythematosus (2, 3). Household, community, and poor health care systems to identify and manage women at high risk are factors that limits effective control of preeclampsia in developing countries (10).

Because of unpredictable nature and unavailability of curative treatment for Pre-eclampsia, it accounts for 40%- 60% maternal death in developing countries (2,13). If the disease is left untreated, it leads to maternal complications like; renal failure, liver failure, thrombocytopenia and neurological sequelae, and fetal complications like; preterm birth, respiratory distress syndrome, fetal growth restriction and intra-uterine death (11). In study area based on highlighted review of ANC attended recording (HMIS), there is late visiting of hospital for regular pregnancy follow up and also there is high lost follow up of regular ANC, which leads to the diagnosis of pre-eclampsia and associated factor after the disease is advanced and complicated.

In general, preeclampsia has enormous effects on the mother and her offspring and it can complicate the pregnancy (19). So that different research activities that try to explain the

problem are important. This study provided relevant information about the magnitude of the problem and related factors in Shashemene Comprehensive Specialized and Melka Oda General Hospitals where there has been no prior similar study. This result is crucial to the Hospitals, regional health bureau and other stakeholders. The main objective of this study was to determine the magnitude of preeclampsia and its associated factors among pregnant women above 20 week of gestation who attends ANC at both Hospitals Shashemene, Ethiopia.

1.3. Significance of the study

Pre-eclampsia has been increasing and linked to multiple factors, making prevention of the disease a continuous challenge (14, 16). Even though it is one of the leading causes of maternal mortality in Ethiopia; few studies have been conducted on Pre-eclampsia (11, 14 ,16). Thus, by this study we assessed magnitude of the disease and associated factors among pregnant women who attend ANC at Shashamane comprehensive specialized and Melka Oda General Hospitals and suggest measures which could be used to address them within the local context.

Early diagnosis and intervention of pre-eclampsia has tremendous impact on outcome of pregnancy and health of the mother (11). So by this study we showed real prevalence of the disease in pregnant women who attend ANC at Shashamane comprehensive specialized and Melka Oda General hospitals and do on it to prevent or delay morbidity and mortality of pregnant women from pre-eclampsia by early detecting, as well as, to improve the health of mothers, neonates and/or the population in general.

2. LITERATURE REVIEW

2.1 Magnitude of Preeclampsia

2.1.1 Global Burden/ Magnitude of Pre-eclampsia

Pre-eclampsia is a multisystem disorder that typically affects 2%–5% of pregnant women and is one of the leading causes of maternal and perinatal morbidity and mortality globally; especially when the condition is of early onset (3, 5). Incidence of preeclampsia is 7 times higher in low and middle income countries and the risk of a woman in a low income country dying of preeclampsia is 300 times that of a woman in a high income country (4). As there are about 127 million births annually in the world, the risk of maternal death from pre-eclampsia is approximately one in 1700 to one in 2100 deliveries globally (21)

In the developed world, where safe emergent cesarean section delivery is available, the burden of morbidity and mortality due to preeclampsia is on the neonate (21). Pre-eclampsia and the life-threatening condition of eclampsia (seizures associated with this disorder) constitute an important contributor to the burden of bad maternal-newborn outcomes (22). Globally, Pre-eclampsia accounts for about 1 in 7 maternal deaths (22). According to data from a multi country study conducted by the World Health Organization in Argentina, Egypt, India, Peru, South Africa, and Viet Nam, which included 8,000 pregnancies during antenatal care, pre-eclampsia was the primary obstetrical cause for 1 of 4 perinatal deaths (22).

Pre-eclampsia decreases health-related quality of life and increases the risk of post-partum depression; children born to mothers with pre-eclampsia have an increased risk of Broncho-pulmonary abnormality and cerebral palsy, caused by preterm birth and being small for gestational age. (23)

2.1.2 Regional (Africa) magnitude of Pre-eclampsia

In sub-Saharan Africa, 1 in every 1,500 pregnancies ends in a maternal death attributable to pre-eclampsia (22). It is estimated that 9.1 % of maternal deaths in Africa are due to pre-eclampsia (24). In SSA countries preeclampsia is among the top five leading causes of morbidity and

mortality of women and babies (25). Preeclampsia increases the risk of poor outcomes for both the mother and the baby; If left untreated, it may result in seizures (26).

Maternal and associated neonatal mortality due to PE in sub-Saharan Africa remain unacceptably high (26). Study done in Mulago Hospital (Kampala, Uganda), major causes of maternal death is pre-eclampsia (27). A Prospective Cohort Study done at Mulago Hospital, Uganda shows that; 34% out of the 188 women analyzed to have pre-eclampsia had persistent three months after delivery (27). Other study done in south Africa, among 1589 births from pre-eclamtic mother, there were 332 perinatal deaths; of these, 281 (84.5%) were stillbirths. Of 1308 live births, 70.0% delivered <37 completed weeks and 41.7% delivered <34 weeks' gestation (28). Preeclampsia has been a major cause of poor result in pregnancy and is a leading cause of maternity death in Africa (30).

2.1.3 National and regional(Oromia) burden of Pre-eclampsia

A five-year retrospective cross sectional study conducted in Ethiopia on trends of preeclampsia revealed an increment in the trends of prevalence of preeclampsia (2.2% in 2009 and 5.58 % in 2013) with the five-year average proportion of preeclampsia is 4.2%(20). According to Ethiopian National Emergency Obstetric and Newborn Care about 10% of all maternal mortality were due to pre-eclampsia (8, 29). Because only 6–7 % of births occur in health facilities in Ethiopia, it is unknown whether these findings over- or underestimate the true incidence (8). Pre-eclampsia related deaths appear to be increasing and linked to multiple factors, making prevention of the disease a continuous challenge and it is one of the top five direct causes of maternal and infant adverse outcome (5).

On the basis of Dilla University Referral Hospital in Southern Nations Nationalities and People Data shows, the incidence rate of preeclampsia was found to be 2.23 % (30). The other study done at Dessie referral hospital in Amhara Region of northern Ethiopia shows the prevalence of preeclampsia among pregnant women was found to be 8.4%. (26). The country has identified PE as one of the major causes of maternal mortality and working on improvement of the main components of quality health services (5).

According to Study done in Nekemte Referral Hospital from July 2015 -June 2017; among 6826 total delivery records, 199 women developed hypertension during pregnancy. Among 199 women, 76.9% were developing pre-eclampsia (19).

In a setting where home-based self-care is poor; expectant outpatient management of preeclampsia without severe features, once per week visit is not adequate; it is associated with an increased risk of maternal and perinatal morbidity and mortality (29).

2.2 Factors associated with Preeclampsia

2.2.1 Obstetrics and Maternal factors associated with the development of Pre-eclampsia

Multiple pregnancies; intrauterine fetal growth restriction; previous history of PE; nulli parity; hydatid form mole pregnancy; short and long inter pregnancy intervals are Obstetrics factors associated with the development of Pre-eclampsia (3). A Systematic review reported that the increased risk for PE persists even after adjusting for other risk factors, such as maternal age, race, and body mass index (BMI) (3): the risk of PE was 4.1% in the first pregnancy and 1.7% in later pregnancies overall (3). Advanced maternal age, age greater than or equal to 35 years at the time of delivery, is associated with 1.2 to 3-fold increased risk of developing PE (3). There is strong relationship between pre-eclampsia and hydatid form mole pregnancy (31).

A study focusing on PE according to severity of disease showed that a history of PE doubled the risk of developing early onset PE (<32 weeks) in a subsequent pregnancy as opposed to late-onset PE and Parous women without prior history of PE have reduced risk of PE (8); Both short and long inter pregnancy intervals are associated with an increased risk of PE (3); use of assisted reproductive technologies doubles the risk of PE (3). An important determinant of preeclampsia is failure of placentation, particularly the physiological transformation of spiral arteries, which leads to a stressed, under perfused placenta(20).

For each increased year in age at menarche there was a drop in mean arterial blood pressure (mmHg) of 0.6 at 11.9 weeks, 0.9 at 31.4 and 37.0 weeks, and 0.4 at 38.8 weeks which shows Age at menarche is negatively associated with PE, so those with the earliest age at menarche have the highest risk of pre-eclampsia (32)**.** Study done on the relationship of obesity and pre-eclampsia shows; Among 834 women with obesity and 3,106 with a normal BMI, 77 (9.2%) and 105 (3.4%) developed preeclampsia, respectively (34).

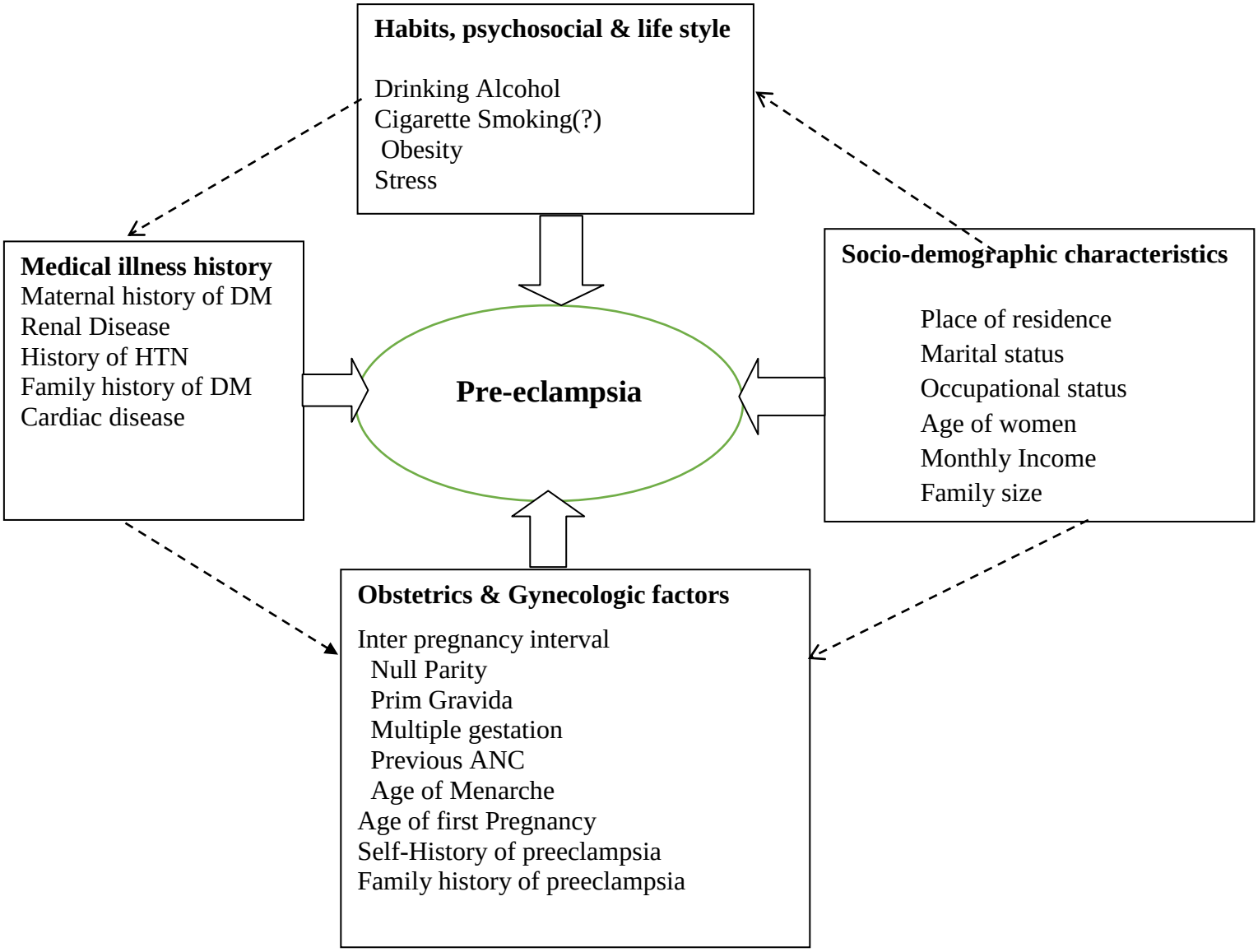
2.2.2 Socio-demographic, Psychosocial, family and medical factors associated with Pre-eclampsia

Family history of Pre-Eclampsia Daughters or sisters of women with PE are 3–4 times more likely to develop the condition than women without a family history (29). Large population studies suggest that the risk of PE is higher in Afro-Caribbean women (20%–50%) and South Asian origin than in those of non-Hispanic white women (adjusted OR 1.3; 95% CI, 1.2–1.4) (3). African ancestry women are at greater risk of preeclampsia than other racial groups (30)**.** There is significant positive association between pre-eclampsia and drinking alcohol during pregnancy (33). Alcohol users during current pregnancy are two times more likely to develop pre-eclampsia compared to non-users (AOR = 0.1.984; 95% CI: 0.77, 5.108) (33).

Other factors that related to PE are: Hyperglycemia in pregnancy (type 1 and 2 diabetes mellitus); pre-existing chronic hypertension; renal disease; autoimmune diseases, such as systemic lupus erythematosus; antiphospholipid syndrome (2). Interestingly, pre-existing diabetes mellitus and PE share many risk factors including advanced maternal age, null parity, pre-pregnancy obesity, nonwhite race, and multiple pregnancy (3). Most Ethiopian women consume insufficient Calcium which increasing risk of pre-eclampsia (8).

There is unclear association between smoking during pregnancy and incidence of preeclampsia; some study shows as it has protective effect for pre-eclampsia and other debates as it has risk for the disease (35). The prevalence of preeclampsia is 9.3% in euthyroidism and 23.1% in hypothyroid women; which shows a significant relationship was between hypothyroidism and severity of preeclampsia. Preterm delivery was seen in 18.4% and 25.0% of euthyroid and hypothyroid women, respectively (36). Pheochromocytoma is a catecholamine-producing adrenal tumor, which cause of pre-eclampsia (37).

Figure 1: - Conceptual framework of Pre-eclampsia and associated factors



Source: adapted from different per reviewed articles

3. OBJECTIVES

3.1 General objective

- To determine the magnitude of pre-eclampsia and its associated factors among pregnant women above 20 weeks of gestation who attend Ante Natal Care in Shashemane Comprehensive Specialized and Melka Oda General Hospitals, West Arsi Zone, South Ethiopia, 2021

3.2 Specific Objectives

- To assess the magnitude of preeclampsia among pregnant women who attend ANC in Shashemane Comprehensive Specialized and Melka Oda General Hospitals
- To identify factors associated with preeclampsia in pregnant women who attend ANC at Shashemane Comprehensive Specialized and Melka Oda General Hospitals

4. Methods and Materials

4.1. Study area

The study was conducted in Shashemane Comprehensive Specialized and Melka Oda General Hospitals around and in Shashemane town. Shashemane town is one of the fast growing towns in Oromia region and serving as a capital city of west Arsi Zone. The town is 250 km far from Addis Ababa and 25km away from Hawassa; which is capital city of Sidama region. It has 8 kebeles and grounded on 763 square km. Based on data from Shashamane town Administration of 2021, the town has 288,216 populations with 141,226(49%) male and 146,990(51%) women.

Shashamane has two governments and one private hospitals. It has also 4 Health Centers and 16 Private clinics. Shashamane Comprehensive Specialized Hospital is found at distance of 14km from Shashamane town to the Northeast direction. The Hospital gives service for around 2.4 million peoples of west Arsi Zone and neighboring Regions like Sidama region, southern nations, nationalities and people's region and Zones in Oromia Region like; Bale, East Arsi, East Shoa, Guji and others.

Shashamane comprehensive Specialized Hospital has 4 main wards: - Surgery, Internal medicine, Gynecology and Obstetrics, and Pediatrics. And also other departments like psychiatrics, Ophthalmology, Dental and Dermatology. The Obstetrics and Gynecology ward has four Gynecologists, one General Practitioner, one IESO and 26 midwifes with 37 functional beds. In the past six months; from October 1 to March 30, there were 1779 deliveries in Shashemene comprehensive Specialized Hospital Obstetrics ward.

Melka Oda General Hospital is found in Shashemane town, 'zero asir' kebele. The Hospital give service for around 600,000 peoples. It has 4 main wards: - Surgery, Internal medicine, Gynecology and Obstetrics and Pediatrics. The Obstetrics and Gynecology ward has one Gynecologist, one General Practitioner, four IESO and 22 midwifes with 24 functional beds. In the past six months; from October 1 to March 30, there were 1569 deliveries in MOGH.

4.2. Study design and period

Facility based Cross sectional study was conducted among pregnant women who was attended ANC at shashamane Comprehensive Specialized and Melka Oda General Hospitals. The study was conducted from July 11- September 9, 2021.

4.3. Population

4.3.1 Source population

All pregnant women who attended/visited ANC clinic at Shashamane Comprehensive Specialized and Melka Oda General Hospitals.

3.3.2 Study population

All Pregnant Women above 20 weeks of gestation who attended ANC at shashamane Comprehensive Specialized and Melka Oda General Hospitals.

3.3.3 Study unit

All systematically selected pregnant women who attended ANC at shashemene comprehensive specialized and Melka Oda General Hospitals.

4.4. Inclusion &exclusion criteria

4.4.1 Inclusion criteria

- Pregnant women with gestational age of above 20 weeks and attended ANC at Shashamane Comprehensive Specialized and Melka Oda General Hospitals was included.

4.4.2 Exclusion criteria

- Pregnant women who had mental problem and can't give consent,
- Pregnant women who had serious medical illness at the time of data collection was excluded.

4.5 Sample size determination

The sample size for first objective was calculated by single population proportion formula by considering the following assumptions: -

Proportion of preeclampsia, which is 12.4% in Mattu karl referral hospital (29), Confidence interval 95% (Z=1.96), the margin of error d = 0.03, and with 10% non-respondent rate the final sample size is 510

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

n = (1.96)^2*(0.124)(0.876)/(0.03)^2

n = 464.

nf= n + n*NRR

nf = 464 + 464*0.1 **= 510**

Sample size for the second objective, which is risk factors identification, was calculated using double population proportion formula and presented with the following table.

Table 2: Sample size determination for factors associated with Preeclampsia

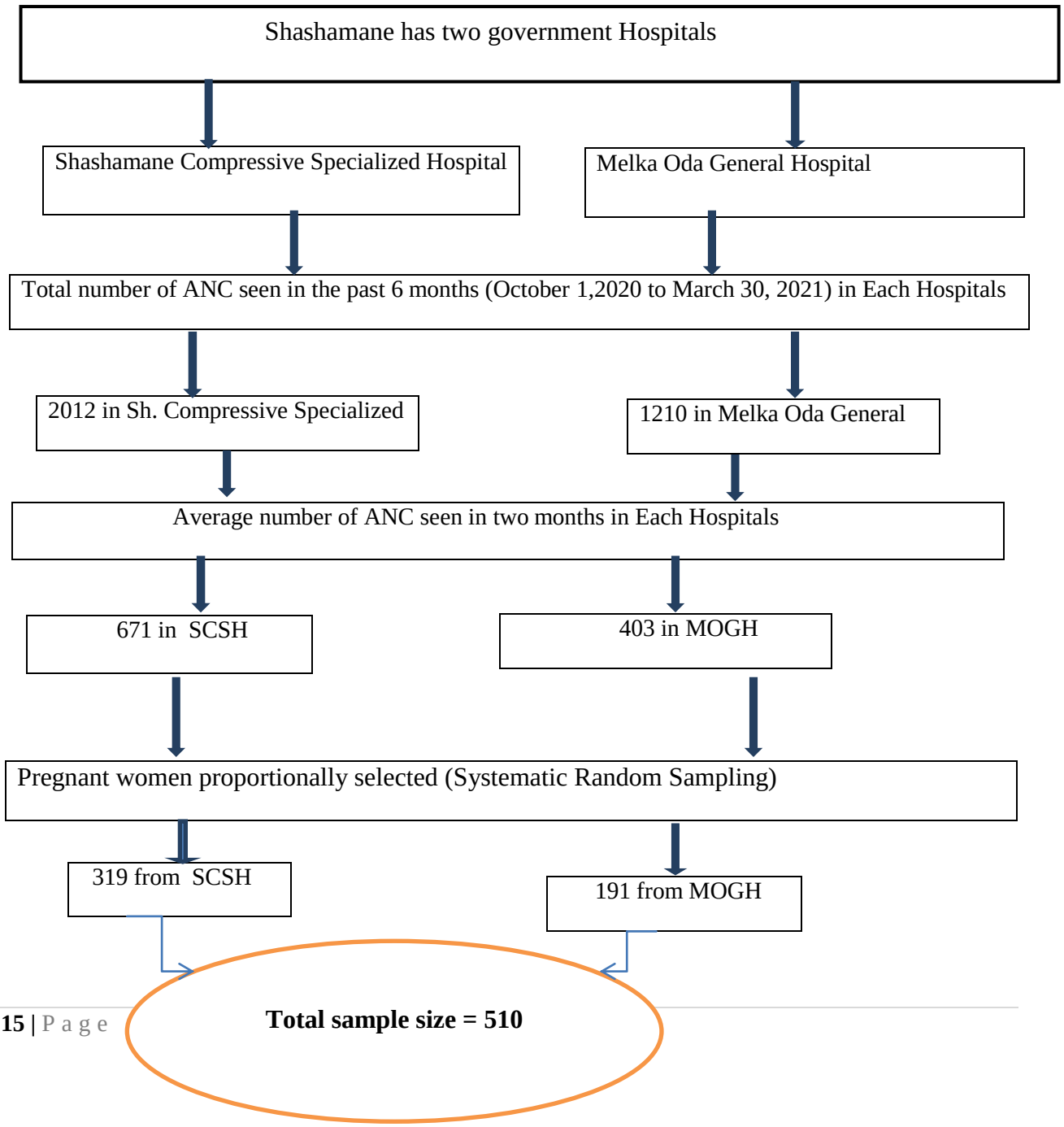
Variables	CI(95%)	Power	% of unexposed with outcome	AOR	Ratio of unexposed to exposed	Non response rate	Sample size	Reference
Alcohol • Yes • No	95%	80	81.1	3.97	1	10%	238	(Teklit G,2017) (5)
Parity • null • multi	95%	80	85.2	2.55	1	10%	510	(Alemayehu S, 2019) (29)
Family history of hypertension • Yes • No	95%	80	83.2	7.77	1	10%	176	(Tarkie A,2017) (33)

Then, the sample size for the first objective was 510 and sample size for the second objectives; which is associated factor for PE was 510 which, unfortunately, were equal sample size for both. Therefore, the final sample size for study was 510 from either of the objectives.

4.6. Sampling technique

Shashamane Comprehensive Specialized and Melka Oda General Hospitals was purposely selected because these two Hospitals are the largest public Hospitals with maternal health service.

Figure 2: Schematic presentation of sampling procedure/technique.



4.7. Variables

4.7.1 Dependent Variable

- Magnitude of pre-eclampsia

4.7.2 Independent Variables.

Socio demographic characteristics of pregnant women

Place of residence

Marital status

Occupational status

Age

Income

Obstetrics and Gynecologic history of pregnant women

Age of menarche

multiple pregnancy

Null Parity

ANC follow up

Inter pregnancy interval

Prim Gravida

Self-History of preeclampsia

Family history of preeclampsia

Habits, Psychosocial and life style

Drinking Alcohol

Cigarette Smoking

Stress

Obesity

Medical related history

Maternal Chronic hypertension

Maternal DM

Renal Disease

Family history of hypertension

Family history of DM

Cardiac disease

Anemia

4.8 Operational definition

Hypertension: -is when blood pressure exceeds 140 mm Hg systolic and/or 90 mm Hg diastolic.

Hypertensive disorders of pregnancy: -is a group of diseases which includes: preeclampsia, eclampsia, gestational hypertension, and chronic hypertension.

Preeclampsia (PE): - is Hypertension (blood pressure ≥ 140 /90 mmHg) accompanied with proteinuria exceeding 300 mg /24 hours after 20 weeks' gestation (2).

Atypical Pre-eclampsia: - is any clinical presentation of pre-eclampsia < 20 weeks of gestations and >48 hours after delivery.

Proteinuria: -the presence of an excess serum proteins in the urine.

Eclampsia: -is the onset of seizures (convulsions) in a woman with pre-eclampsia.

Gravidity: - indicates the number of times the woman has been pregnant

Parity: - indicates the number of births >20-weeks of gestation (including viable and non-viable)

Nulliparous: - A woman who has never carried a pregnancy beyond 20 weeks.

Hydatid form mole: - growing mass of tissue inside womb or uterus that will not develop to baby, (abnormal conception).

Obesity: - is when body mass index(BMI) ≥30 kg/m^2

Menarche: - is first menstrual cycle or first menstrual bleeding in females.

Systemic lupus erythematosus is an autoimmune disease in which the immune system attacks its own tissues, causing widespread inflammation and tissue damage in the affected organs.

Polycystic kidney disease is numerous cysts to grow in the kidneys which are filled with fluid.

Intra Uterine Growth Retardation: - is a term that's used to describe a baby who isn't growing as quickly as he should be inside the womb.

Neonatal*:* - the neonatal period is the first 4 weeks of a child's life.

Renal Disease: - It include acute and long standing chronic disease like; urinary tract infection, acute renal failure, pyelonephritis, chronic kidney disease.

4.9 Data collection tools and procedure

Data was collected using questionnaires which was adapted from different literatures. First, the questionnaires were prepared in English and then translated to the local language "Afaan oromo". The questionnaire contained about socio demographic characteristics; Obstetrics and gynecologic history; Habits and life style history: Family, Maternal Medical history. Four data collectors and one supervisor was recruited.

4.10 Data quality and management.

The quality of data was maintained before, during and after the data collection period. To maintain the quality of collected data, data collectors were trained on the significance of the research, independent factors, how to control the quality of data, importance of privacy, confidentiality, discipline and other relevant information.

During the data collection period, the collected data was checked for completeness and consistencies by the investigator through close follow up. After the data collection, the collected data was rechecked for its completeness and consistency.

4.11 Data processing and analysis.

Data was entered and cleaned using Epi-data version 3.1 and SPSS version 24.0 for further analysis. Frequencies and cross tabulations were used to check for missed values and variables. Descriptive statistics (Frequencies, proportions and measure of central tendency and measure of variation) was used to describe the study subject. Bivariate logistic regression analysis was done primarily to check which variable was associated with dependent variable individually.

To limit the number of variables and unstable estimates in the subsequent models, only variables with p value < 0.2 in the bivariate analysis will be further entered into multivariate logistic regression model. In order to assess the goodness of fit of the final model Hosmer and Lemeshow goodness-of –fit test and log likelihood was applied. Finally, in all analyses, P value <0.05 was considered as significant and presented by adjusted odds ratio (AOR) with 95% C.I.

4.12. Ethical consideration.

This study was ethically approved by the Research Ethics Committee of Pharma College, School of Graduate Studies. Likewise, Official letter was enquired from medical director of SCSH and MOGH for Permission. Informed verbal consent was obtained from all respondents after explanation of the purpose of study. They have the right to refuse and assured of confidentiality of the response. Data collectors was strictly oriented about patient confidentiality and the patients' name or card number was never be used by any means throughout the research.

4.13. Dissemination of findings

The findings of the study will be presented to public defense at Pharma college Hawassa campus, following which the final edition will be circulated to post graduate studies through hard copies. Moreover, the study result will be disseminated to Shashemane Comprehensive specialized hospital, Melka Oda General Hospital, West Arsi zone Health Bureau, and Shashemane woreda Health Office and other concerned stake holders. In addition, effort will be exerted to publish the paper and appraisal that will be written based on the practical exposure.

5 RESULTS

5.1 Socio-demographic characteristics of the study participants

A total of 510 participants who come for ANC follow up in Shashemene Comprehensive Specialized and Melka Oda General Hospitals were enrolled in the study with the 100% response rate. The mean (±SD) age of the participants was 28.18 6.012] and nearly five-in-six,82% were found in the age group of 18-34 years.

Almost all of the participants, 500 (98%) were married and more than half, 288 (56.5%) of the participants were Urban residents. Concerning educational status of the respondents, 436 (85.5%) can at least write and read. The mean (±SD) household monthly income of the women was 5,989.04 birr. The mean (±SD) Body Mass Index (BMI) of pregnant women was 23.459 (3.2) (Table 2).

Table 2: - Socio-demographic characteristics of pregnant women who attended ANC at Shashemane Compressive and Specialized and Melka Oda General Hospitals

Variables	**Frequency**	
Age of respondents	**In number**	**percentage**
< 18	14	2.7
18 – 24	128	25.1
25 – 29	159	31.2
30 – 34	131	25.7
>= 35	78	15.3
Mean ± SD	28.18 ± 6.01	
Marital status		
Married	500	98
Single	6	1.2
Divorced	4	0.8
Place of residence		
Urban	288	56.5
Rural	222	43.5

Variables	Frequency	
Educational Status of the women		
Can't read and write	74	14.5
Primary	229	44.9
Secondary	149	29.2
Diploma and Higher	58	11.4
Respondent's husband educational status		
Unable to write and read	23	4.5
Primary	134	26.3
Secondary	147	28.8
Diploma and Higher	206	40.4
Respondent's family size		
single person	21	4.1
2- 5	395	76.5
6- 10	83	16.3
>= 11	10	2.0
Household Monthly income		
<5000 birr	263	51.6
5000 – 10000	201	39.4
➢ 10000	46	9.0
Body Mass Index (BMI)		
< 18	14	2.7
18 – 25	363	71.2
> 25	133	26.1
Ever Change husband		
Yes	40	7.8
No	470	92.2

5.2 Obstetrics and Gynecologic history of the study participants

The mean (±SD) age of first pregnancy of participant women was 20.91(3.5). Out of 370 respondents, about 310 (83.8%) of the participants ever had a history of ANC follow up during previous pregnancy. From women who come for regular ANC follow up, about 418(82%) of the pregnant women, knows that they have singleton intrauterine pregnancy. The mean (±SD) age of menarche was 13.17(). Concerning gravidity, 140 (27.5%) of respondent was prim gravida and 9.0% of responding pregnant women have been pregnant > five times and 52(10.2%) have previous history of preeclampsia. (Table 3).

Table 3: - Obstetrics and Gynecologic History of pregnant women who attended ANC at Shashemane Compressive and Specialized and Melka Oda General Hospitals

Variables	**Frequency**	**Percentage**
Age at first pregnancy		
< 18	15	4.1
18 – 59 months	315	85.1
>= 5years	40	10.8
ANC		
Yes	310	83.8
No	60	16.2
Number of fetus		
one	418	82.0
two	52	10.2
Unknown	40	7.8
Gravidity		
One	140	27.5
2 – 5	324	63.5
>5	46	9.0
Parity		
null	8	2.2
2 – 4	335	90.5

> =5	27	7.3
Age of Menarche		
11	48	9.4
12	95	18.6
13	177	34.7
14	113	22.2
>= 15	77	15.1
Inter pregnancy interval		
< 18 months	15	4.1
18 – 59 months	315	85.1
> =5 years	40	10.8
Previous history of preeclampsia		
Yes	52	10.2
No	458	89.8
Family history of Preeclampsia		
Yes	41	8.0
No	469	92.0

5.3 Behavioral and nutritional characteristics of participants

Most of the study participants 277 (54.3%) consume most frequently cereals and legumes. Majority 422 (82.7%) eat three times per day, whereas only 52 (10.2%) consumes four and above meals per day. Out of 510 respondents, 23 (4.5%) of them drinks alcohol. Forty of 510 respondent pregnant women have stress and only 2(0.4%) of pregnant women who come for ANC follow up during study period smokes cigarette (Table 4).

Table 4: - Habits and nutritional status of pregnant women who attended ANC at Shashemane Compressive and Specialized and Melka Oda General Hospitals

Food most frequently consumed		
Fruits and vegetables	129	25.3
Legumes and Cereals	277	54.3
Meat and Fish	21	4.1
Cheese and Butter	32	6.3
Unspecified	51	10.0
How many times you eat per day		
Twice	36	7.1
Three	422	82.7
Four and above	52	10.2
Alcohol consumption history		
Yes	23	4.5
No	487	95.5
Stress history		
Yes	40	7.8
No	470	92.2
Cigarette Smoking history		
Yes	2	0.4
No	508	99.6

5.4 Respondent's Medical history

From all pregnant women who was interviewed, around 39 (7.6%) have self-history of chronic hypertension and 43 (8.3%) have family history of DM. (Table 5).

Table 5: - Clinical and Laboratory Status of pregnant women who attended ANC at Shashemane Compressive and Specialized and Melka Oda General Hospitals.

Variable	Frequency	Percent
History of chronic hypertension		
Yes	39	7.6
No	471	92.4
History of DM		
Yes	26	5.1
No	484	94.9
Family History of DM		
Yes	43	8.4
No	467	91.6
History of kidney disease		
Yes	69	13.5
No	441	86.5
Cardiac History		
Yes	26	5.1
No	484	94.9
Woman's BP measurement at time of diagnosis		
< 140/90	467	91.6
>= 140/90	43	8.4

5.5 Magnitude of pre-eclampsia

Generally, of 510 women's interviewed 46 (9%) were found to be preeclamptic. Out of 46 preeclmaptic women with the diagnosis of preeclampsia, 41(89%) had at least one severity sign. Majority, 58.7% of women with preeclampsia have protein value +2. Out of women with PE 6 (13%) have deranged Liver function test and also 5 (10.9%) have abnormal Renal function test. Of 46 preeclamptic women, 7 (17.9 %) have hemoglobin Value less than 11gm/dl. Eleven (23.9%) of women with PE have thrombocytopenia, platelet value <150,000. Most of women with preeclampsia; 41 (89.2%) have one or more severity sign. Around half, 43.5 % of pregnant women develop preeclampsia at gestational age less than 28 weeks (Table 6).

Table 6: - Clinical and Laboratory features of only pregnant women with Pre-eclampsia who attended ANC at Shashemane Compressive and Specialized and Melka Oda General Hospitals

Variables	**Frequency**	**Percentage**
Pre-eclampsia		
Yes	46	9.02
No	464	90.98
Protein by dipstick		
+1	4	8.7
+2	27	58.7
+3	15	32.6
Gestational age at developing PE		
< =28 months	20	43.5
>28 months	26	56.5
Liver Test		
Normal	40	87.0
Abnormal	6	13.0
Renal Test		
Normal	41	89.1

Abnormal	5	10.9
Hemoglobin Value		
< 11	7	17.9
>=11	39	82.1
Platelet Value		
< 150,000	11	23.9
>= 150,000	35	76.1
Severity Sign		
Only one sign	13	28.2
No sign	5	10.8
Two and greater sign	28	61.0

5.5 Factors associated with pre-eclampsia

On bi-variable analysis, variables like age of women, attending education, body mass index, place of residence, age of menarche, number of pregnancies, previous history of ANC visits, Alcoholic history, Stress history, having hypertension, Cardiac disease, self-history of preeclampsia, preeclampsia in the patient's family were eligible for the final model.

In the multivariate logistic regression analysis, age of women, body mass index, previous history of pre-eclampsia, family history of preeclampsia and having a previous history of ANC, were found to be associated factors of pre-eclampsia.

The pregnant Women with age 35 or above were 5.7 times more likely to be pre-eclamptic as compared to those women with age less than thirty-five [AOR 5.775(95% CI; 1.797,18.560)]. Women with no history of ANC on previous pregnancy were 4.5 times more likely to be pre-eclamptic as compared to those who had [AOR; 4.580; 95% CI;1.538,13.635)]. Having body mass index 30 or more poses 3 times risk of preeclampsia when compared to women with body mass index less than thirty [AOR: 2.97; 95% CI, 1.020,8.660)].

Likewise, Women with a history of having a previous pre-eclampsia were 4.5 times more likely to be pre-eclamptic as compared to their counter parts [AOR: 4.358; 95% (CI;1.434,13.251)]. In addition, women with family history of pre-eclampsia were 8.5 times more likely to be pre-eclamptic as compared to those who had no family history of PE [AOR; 8.679 95% (CI; 2.680,28.102)]. (Table 7).

Table 7: - Association of socio-demographic and other variables with preeclampsia of pregnant women who attended ANC at Shashemane Compressive and Specialized and Melka Oda General Hospitals

Variables	Pre-eclampsia		OR 95% CI	
	Yes	No	Crude	Adjusted

Age of Women (510)				
<35	32	423	1.00	1.00
>= 35	14	41	4.514(2.230,9.136)	5.775(1.797,18.560)
Educational Status				
Unable to Read & write	15	59	3.432(1.073,10.982)	0.985(0.152,6.369)
Primary	20	209	1.292(0.424,3.937)	0.467(0.090,2.429)
Secondary	7	142	0.665(0.187,2.365)	0.173(0.026,1.170)
Diploma and above	4	54	1.00	1.00
BMI (n=510)				
<30 kg/m2	36	436	1.00	1.00
>=30 kg/m2	10	28	1.951 (1.041,3.658)	2.971 (1.020,8.660)
Number of Fetus (510)				
Singleton	30	388	1.00	1.00
Twin	13	39	4.311(2.070,8.940)	2.397(0.695,8.270)
Unknown	3	37	1.049(0.305,3.601)	1.750(0.358,8.552)
Age of menarche				
>11 years	37	425	1.00	1.00
<= 11 years	9	39	2.651(1.192,5.893)	3.719(0.920,15.035)
Place of residence				
Urban	20	228	1.00	1.00
Rural	26	196	1.778(0.965,3.276)	0.986(0.327,2.271)

Previous Hx of ANC (370)				
Yes	22	228	4.364(2.108,9.033)	4.580(1.538,13.635)
No	15	22	1.00	1.00
Alcohol History				
Yes	8	15	6.302(2.512,15.809)	3.128(0.617,15.851)
No	38	449	1.00	1.00
Stress history (510)				
Yes	20	21	4.714(2.172,10.230)	0.955(0.183,4.992)
No	26	443	1.00	1.00
Self-history of PE				
Yes	11	29	11.733(5.914, 23.278)	4.358(1.434,13.251)
No	35	435	1.00	1.00
Self-history of HTN (510)				
Yes	13	26	6.636(3.122 14.105)	1.895(0.582 6.170)
No	33	438	1.00	1.00

Cardiac disease history				
Yes	11	15	9.408(4.018,22.025)	2.125(0.388,11.641)
No	35	449	1.00	1.00
Family history of PE (510)				
Yes	20	49	16.227(7.828, 33.638)	8.679(2.680,28.102)
No	26	415	1.00	1.00

6 Discussion

Institutional based cross sectional study was conducted among preeclampsia of pregnant women who attended ANC at Shashemane Compressive Specialized and Melka Oda General Hospitals to identify the magnitude of preeclampsia and its associated factors. Our study result shows 9.02% of pregnant women have preeclampsia which is comparable with Study done at Dessie referral hospital in Amhara Region of 8.4% of pregnant women (26); In Ethiopia as a general of 11% of women (11); Africa preeclampsia prevalence was 10 % of pregnancies (5) and other study done in different Hospitals in USA and Iran have magnitude of Pre-eclampsia 9% (2) and 9.5 % (38) respectively; which all are almost agreed with our study result.

Based on our current study with 9% magnitude of preeclampsia in 2021 and other study done in different regions of the country; it is difficult to predict the trends of preeclampsia in Ethiopia: - Halaba Kulito General hospital 9.9% in 2020 (11), Addis Ababa selected government Hospital 4.2% in 2016 (5), Dessie Referal Hospital 8.4% in 2015 (26). Even though we can't predict the trends of PE, these result showed that; the magnitude of the disease is high in Ethiopia when compared to world magnitude; which was approximately 2 % (24).

Around 43.5% of pregnant women was diagnosed with PE at 2nd trimester of pregnancy and this is explained by concept of early diagnosis and intervention of pre-eclampsia has tremendous impact on outcome of pregnancy and health of the mother (11). Among pregnant women who was diagnosed with pre-eclampsia; 89% of them have at least one severity sign: which was lower than study done in Jimma university Specialized Hospital with 97% of pregnant women have severity sign (16) and higher than study done in Iran with 82% of women was with severity sign (38). This result indicates that we should have to screen for Preeclampsia early as possible in mild case or before any severity sign occur.

The Age of women, Body Mass Index, Self-history of preeclampsia, family history of pre-eclampsia are good independent predicating variables for preeclampsia after analyzed by multivariate logistic regression. Whereas having Previous history of ANC have protective effect for preeclampsia. Out of 510 pregnant women; 2.4% are age less than 19years and 15.3% are age greater than 34 years old. This shows 17.7 % of pregnant women who attended ANC at SCSH

and MOGHs are more prone to pre-eclampsia; as previous study shows that extreme age women are more at risk for preeclampsia (3).

The odds of developing PE of women with age 35 years or above is 5.5 times higher than that of age less than 35 years. The finding is supported by studies done in Dessie (26) and lower than study done by FIGO (3). This could be due to age above 35 years are more likely to have cardiovascular diseases, renal disease, Diabetes mellitus and obesity which is probably reflected in an increase in hypertension and also preeclampsia.

The adjusted odds of PE in Obese pregnant women is 3 times higher than that of lean body weight women. This result is Agreed with study done on association of PE with obesity (34) and other study done in Thai university Hospital (41); but the result is higher when compared to study done in USA (2). This may be due to obese women are also at risk of Cardiac, Renal and DM diseases which are also a common risk factor for pre-eclampsia and lack of consuming protective nutrition could be also a factor.

Pregnant women who have no previous history of Ante natal care are 4.5 times at increased risk of the disease than that of women who have regular ANC follow up. This result shows the risk of PE is higher in our study area when compared to joint Study done in sub-Saharan Africa (25). This reduced risk of PE for women with previous regular ANC by 78.2% may be due to: - learn how to reduce risk of PE, nutritional modification, doing simple physical exercise and taking preventive elemental supplementation as early as possible.

We found that previous self- history of preeclampsia is one of the main determinants of preeclampsia in pregnant women, as women with previous history of preeclampsia had increased risk of preeclampsia by around 4 times compared to non preeclamptic women. This is lower when compared to study done in Iran (38), Central Tigray (40), Halaba Kulito (11), Thailand (41) and agreed with study done by FIGO (3).

In this study, the multivariable analysis revealed that a family history of preeclampsia was significantly associated with preeclampsia development. Women who had a family history of preeclampsia were 8.5 times higher odds of developing preeclampsia than their counterparts.

This is comparable with study done in Dessie, Amhara region, (26) and higher than study done in central Tigray (39) and study done in different Hospitals of USA (2).

7 Limitations and strength

Limitations: - Even though this study contributes as an input for the policy makers towards the decrement of the maternal morbidity and mortality, it has its own limitations. First, since cross-sectional study design was implemented, it can't establish cause effect relationship between the predictor variables and dependent variables. Second, recall bias might be expected for the last menstrual period, previous self-history of preeclampsia, family history of pre-eclampsia. Finally, since the study was institutional based study, the result will not fully generalizable to the general population of the catchment area.

Strength: - All interviewed pregnant women was allowed to respond each and every question asked. Data was collected by face to face interview by trained personnel.

8 Conclusions and Recommendations

8.1 Conclusions

In the studied area, a considerable proportion of women who presented for regular ANC had pre-eclampsia. Factors such as Age of the women, a self-history of preeclampsia, family history of preeclampsia, obesity were found to be risk factors for preeclampsia and having ANC during previous pregnancy was found to be a protective factor for the development of preeclampsia.

It is important that preventive strategies must be applied to pregnant woman since it is difficult to predict which women will develop preeclampsia. Health seeking behavior of pregnant women in rural area should be encouraged, which provide a chance to diagnose preeclampsia as early as possible and to prevent the complications towards preeclampsia. In both Hospitals of our study area; women who was diagnosed with preeclampsia was admitted, managed and followed closely.

8.2 Recommendations

Strengthening early detection and improving protective factors, such as educating mothers and raising awareness at community level in collaboration with education sector are recommended. Our finding suggests that, health care providers and other stakeholders should use these risk factors as a screening mechanism for early identification by equipping health facilities and management of pre-eclampsia by regular antenatal monitoring; early detection and careful follow-up. Further, community based study is recommended to determine reliable estimate of pre-eclampsia.

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10 ASSURANCE OF PRINCIPAL INVESTIGATOR

I, the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the research project. I will provide timely progress report to my advisor and seek the necessary advice and approval from my primary advisor in the course of the research. I will communicate timely to my advisor and all stakeholders involved in the study of this research.

Name of the student: _____

Signature: _____

Date: _____

Approval of the Advisor

Name of advisor: _____

Signature: _____

Date: _____

11. ANNEXES

11.1 English version information sheet and Consent form

My name is ---------- I am working as a data collector for the study being conducted at this Hospital by Dr. Belay Demisie, who is studying his Master's degree at the Pharma College Hawassa campus. I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

Researcher wishes to find out magnitude of Preeclampsia and assess factors associated to it. The findings of this study has paramount importance for Shashemene CS Hospital, Melka Oda General Hospital, Shashamenne town and Oromia health bureau, to plan intervention programs based on the gap identified and associated factors. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of Master's Program in Public Health for the principal investigator. I will be interviewing you using a questionnaire to provide me with pertinent data that is helpful for the study. The interview will take about 20 minutes, so I kindly request you to spare me this time for the interview.

Whatever information you would provide will be kept confidential. The risk of being participating in this study is minimal, only taking few minutes from your time. There would not be any direct payment for participating in this study: but the findings from this research may reveal important information for the local health planners. You have the right to declare to participate or not in this study. If you decide to participate, you have the right to withdraw from the study at any time and this will not label you for any loss of benefits, which you otherwise are entitled. You do not have to answer any question that you do not want to answer. Have you clearly understood the purpose and over all of this research? If yes, therefore, declare your voluntary consent to participate in this study with your initials (signature).

Signature…….

11.2 English version questionnaire

This data collection Questionnaires is prepared to collect the different variable from Pregnant women who attend ANC at Shashamane Comprehensive Specialized and Melka Oda General Hospitals; to assess magnitude and associated factors of pre-eclampsia.

Data collection Date _____month _____Year_____

Name of the health Institution …….

Name of data collector-_____ signature_____

Phone No: _____

Name of supervisor. _____

signature_____

Table 4: - English version questionnaire for data collection on socio demographic characteristics; Obstetrics and gynecologic history; Habits and life style: Family, Maternal Medical history of pregnant women above 20 weeks of Gestations who attend ANC at Shashamane Comprehensive Specialized and Melka Oda General Hospitals.

Part -01 Socio demographic characteristics of pregnant women			
No	**Questions**	**Responses**	**Code**
101	How old are you?	_____years	
102	Date of visited Hospital	(____/____/_____)	
103	Place of Residence	1.Urban 2. Rural	
104	What is your current marital status?	1. Single 2. Married 3. Divorced. 4. Widowed	
105	What is your educational status?	1. Can't read and write 2. Primary education 3. Secondary education 4. Diploma and above	
106	What is your Husband educational status?	1. Can't read and write 2. Primary education 3. Secondary education 4. Diploma and above	
107	What is your current occupation?	1. Farmer 2. Government employee 3. NGO employee 4. Daily laborer	

		5. Other(specify)	
108	What is your family size?	----------	
109	What is your family monthly income?	_____ETB	
110	Height	_____	
111	Weight	_____	
Part-02 Obstetrics and Gynecologic history			
201	Age of menarche	_____yrs	
202	Age of first pregnancy	_____yrs	
203	Gravidity	----------	
204	Parity	----------	
205	Do you have ANC follow up during previous pregnancy?	1. Yes 2. No	
206	What is number of current pregnancy?	1.singleton 2. twin 3. > or = three	
207	Average inter pregnancy interval	----------	
Part-03 Habits, psychosocial and lifestyle history			
301	What is a food you eat mostly in home?	1. fruits and Vegetables 2. Cereals and legumes 3. Meat and Fish 4. butter and Cheese 5.other	
302	How many times you eat per day?	1. once daily 2. twice per day 3.three times in a day 4. four and above	
303	Are you drinking Alcohol?	1. Yes 2. No	
304	History of Stress	1. Yes 2. No	
305	Are you smoking Cigarette	1. Yes 2. No	
Part-04 Family, Maternal Medical History and laboratory results			
401	Do you have Previous history of pre-eclampsia?	1. Yes 2. No	
402	Gestational Age at developing pre-eclampsia	----------	
403	Is there any person who have pre-eclampsia in your family?	1. Yes 2. No	
404	Do you have previous history of hypertension?	1. Yes 2. No	
405	Do you have history of DM	1. Yes	

		2. No	
406	Is there any person who have diabetes in your family?	1. Yes 2. No	
407	Do you have previous history of renal disease?	1. Yes 2. No	
408	Do you have history of cardiac disease		
409	Woman's BP measurement at time of diagnosis	----------	
410	Urine protein	------	
411	Live function test	1 Normal 2 Abnormal	
412	Renal function test	1 Normal 2 Abnormal	
413	Hemoglobin	-------	
414	Platelet	-------	
415	Presentation symptoms	1 Headache 2 Epigastric pain 3 Right upper quadrant pain 4 Blurring of vision	
Thank you for your cooperation!!!			

11.3 Afaan Oromoo version information sheet and Consent form (Waraqaa Odeeffannoo fi Eeyyamaa)

Maqaan koo ……. jedhama. Ani kanan asitti argameef qorannoo Dr, Belay Demisee; barataa kolleejjii Faarmaa kan ta'e digirii isaa lammaffaa dhukkuba dhiibbaa dhiigaa yeroo ulfaa irratti Hospitaala kanatti adeemsisuuf daataa walitti isaaf qabuufi. Kanaaf immoo isin odeeffannoo kana akka naaf kennitaniif haadholii ulfaa filataman keessaa isaan tokko waan taataniif waa'ee qorannoo kanaa isiniif akkan ibsu yaada keessan gara koo akka naaf taasiftanii kabajaan isin gaafadha.

Qorannoon kun bal'ina dhiibbaa dhiigaafi wantoota isa faana wal qabatanii jiran adda baasuuf kan fayyadudha. Bu'aan qorannoo kanaa Hospitaala Waliigala speeshaalayizdii Shaashamannee, Hospitaala Waliigalaa Malkaa Odaa, waajjira fayyaa magaala shaashamanneetiif, biiroo eegumsa fayyaa oromiyaatiif furmaata dhukkuba kanaa irratti akka karoorfataniif faayidaa guddaa qaba. Hundaa ol kaayyoon qorannoo kanaa barumsa degirii lammaffaa isaa akka xumuruuf isa fayyada. Anis gaaffilee qindaa'oo qorannoo kanaaf ta'an isin gaafadha. Gaaffii fi deebiin keenya daqiiqaa 20 waan fudhatuuf obsaan akka na hordoftan isin gaafadha.

Odeeffannoo isin nuuf kennitan martuu iccitiidhaan qabamu. Midhaan sababa qorannoo kanaan isin irra ga'u yoo jiraate, sa'aa isin amma gaaffii fi deebii kanaaf nuuf kennitan qofa. Hirmaannaa keessaniif kaffaltiin kallattiin isiniif kennamu hin jiru; garuu bu'aan qorannoo kana al-kallattiin dhukkuba kana hir'isuun faayidaa isinif qaba. Gaaffii fi deebii kana irratti hirmaachuu fi hirmaachuu dhabuun mirga keessani. Hirmaachuuf eeyyamamoo taatanii jidduun adda kutuu yoo barbaaddanis mirga guutuu qabdu. Gaaffileen deebisuu hin barbaadne yoo jiraate dhiisuufis mirga qabdu.

Waa'ee qorannoo koo kanaa siritti hubattaniittuu? Deebiin keessan eeyyen yoo ta'e; eeyyamamoo ta'uu keessan mallattoo keessaniin nuuf mirkaneessaa.

Mallattoo……

11.4 Afaan Oromoo version questionnaires for data collection

11.4.1 Unka gaaffilee adda addaa

Unki kun gaaffilee adda addaa haadholii ulfaa torbee 20 olii Hospitaala Speshaalayizdii Shaashamannee fi Hospitaala waliigalaa Malkaa Odaatti hordoffii ulfaa kan da'umsa duraa gochuuf dhufanirraa waa'ee bal'inaa dhiibbaa dhiigaa yeroo ulfaa fi isa faana dhukkuboota hariiroo qaban irratti odeeffannoo walitti qabuuf kan qophaa'edha.

Yeroo itti odeeffannoon walitti qabame: - Guyyaa……. Ji'a……. waggaa…….

Maqaa waajjira fayyaa……

Maqaa nama raga walitti qabee……mallattoo…….

Lakkoofsa bilbilaa…….

Table 5:- Afaan Oromoo version questionnaire for data collection on: Jireenya Hawaasummaa fi Qubsuma Uummataa; Haalota ulfaa fi gadaamessa faana wal-qabatan; Haala jireenyaa, Nyaataa fi araada adda addaa; bu'aawwan laabraatorii fi ogeessa fayyaa

Jireenya Hawaasummaafi Qubsuma Uummataa			
No	**Gaaffii**	**Deebii**	**koodii**
101	Umuriin kee meeqa?	_____	
102	Guyyaa itti qoratamte	(____/____/_____)	
103	Bakka jireenyaa kee essaa?	1. magaalaa 2. Baadiyyaa	
104	Haala gaa'ilaa yeroo ammaa	1.kan hin heerumne 2.heerumteetti 3.wal hiikaniiru 4.jalaa du'eera	
105	Haala barumsaa keessanni?	1. Dubbisuu fi barreessuu kan hin dandeenye 2. sad.1^{ffaa} 3. sad 2^{ffaa} 4. Diploma fi isaa ol	
106	Haala barumsaa abbaa mana keessanni?	1. Dubbisuu fi barreessuu kan hin dandeenye 2. sad.1^{ffaa} 3. sad 2^{ffaa} 4. Diploma fi isaa ol	
108	Baay'na maatii keessani?	----------	
109	Gaaliin maatii kee ji'aan?	_____ETB	
110	Dheerina	_____	

111	Ulfaatina	_____	
Haalota ulfaa fi Gadaamessa faana wal-qabatan			
201	Umurii jalqaba laguu itti argite?	_____	
202	umurii kee yeroo jalqaba ulfooftee	_____	
203	meeqa ulfoofte?	---------- _____	
204	meeqa deesse?	_____	
205	ulfa kana duraaf hordoffii ulfaa gootee beektaa?	1. eeyyen 2. lakki	
206	baay'ina daa'ima garaa keessaa	1. tokoo 2. lakkuu 3. sadii fi isaa ol.	
207	Fageenya Ulfa walitti aanan jidduu jiru avireejiidhaan	----------	
Araadaa fi Nyaataa adda addaa			
301	Naata yeroo baay'ee nyaatamu	1.kuduraafi muduraa 2. midhaan gosoota qamadiifi baaqelaa 3. fooniifi qurxummii 4. dhadhaa fi itittuu 5. kanneen biro	
302	Guyyaatti yeroo meeqa akka nyatta?	1.yeroo tokko 2.yeroo lama 3. yeroo sadii 4.yeroo afurii fi isaa ol	
303	Dhugaatii aalkoolii dhugdaa?	1. eeyyen 2. lakki	
304	Dhiphuu sitti baay'ataa	1. eeyyen 2. lakki	
305	Sigaaraa ni xuuxaa?	1. eeyyen 2. lakki	
Haalota dhukkuba Meedikaalaa haadhaa, maatii ishee fi Bu'aawwan Laaboratorii			
401	Dhiibbaa dhiigaa yeroo ulfaa, ulfa kana duraan jira ture?	1. eeyyen 2. lakki	
402	Torbee meeqaffaatti dhiibbaa dhiigaa yeroo ulfaa qabaachuu beekte?	----------	
403	Dhiibbaa dhiigaa yeroo ulfaa maatii kee keessaa (amma dura) namni qabu jiraa?	1. eeyyen 2. lakki	

404	Amma dura dhukkuba dhiibbaa dhiigaa qabdaa	1. eeyyen 2. lakki	
405	Amma dura dhukkuba sukkaaraa qabdaa?	1. eeyyen 2. lakki	
406	Dhukkuba sukkaaraa maatii kee keessaa (amma dura) namni qabu jiraa?	1. eeyyen 2. lakki	
407	Amma dura dhukkuba kalee qabdaa?	1. eeyyen 2. lakki	
408	Amma dura dhukkuba Onnee qabdaa	1. eeyyen 2. lakki	
409	Dhiibbaa dhiigaa	----------	
410	Qorannoo fincaanii(prootinii)	----------	
411	Qorannoo Tiruu	Normaalii 1 Eeyyen 2 Lakki	
412	Qorannoo Kalee	Normaalii 1 Eeyyen 2 Lakki	
413	Heemogiloobinii	----------	
414	Plaatleetii	----------	
415	Mallattoowwan amma sitti dhagahamu	1 Mataa dhukkubbii 2 Dhukkuba arraba laphee 3 Dhukkuba garaa 4 Ija duraa waa akka qaanqee faca'uu	
Guddaa galatoomi!!!			