

**HARAMAYA UNIVERSITY
SCHOOL OF GRADUATE STUDIES**

**DETERMINANTS OF PREECLAMPSIA AMONG WOMEN
ATTENDING DELIVERY SERVICES IN PUBLIC HOSPITALS IN
CENTRAL ZONE, TIGRAY, NORTHERN ETHIOPIA**

MSc THESIS

TEKLEHAIMANOT GEREZIHHER

May, 2019

Haramaya University, Harar

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**DETERMINANTS OF PREECLAMPSIA AMONG WOMEN
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CENTRAL ZONE, TIGRAY, NORTHERN ETHIOPIA**

**A Thesis Submitted to the College of Health and Medical Sciences,
School of Graduate Studies
HARAMAYA UNIVERSITY**

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Master's in Maternity and Neonatal Nursing**

BY: Teklehaimanot Gereziher

College:	Health and Medical Science
School/Department:	School of Nursing and Midwifery
Program:	Maternity and Neonatal Nurse
Major Advisor:	Dr. Nega Assefa (PhD)
CO-Advisor:	Dr. Tadesse Alemayehu (PhD)

May, 2019

Haramaya University, Harar

APPROVAL SHEET
HARAMAYA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

I hereby certify that I have read and evaluated this Thesis entitled “Determinants of Preeclampsia Among Women Attending Delivery Services in Public Hospitals in Central Zone, Tigray, Northern Ethiopia”. Prepared under my guidance by Teklehaimanot Gereziher; I recommend that it be submitted as fulfilling the thesis requirements.

Dr. Nega Assefa (PhD)	_____	_____
Major Advisor	Signature	Date

Dr. Tadesse Alemayehu (PhD)	_____	_____
Co-Advisor	Signature	Date

As a member of the Board of Examiners of the MSc Thesis Open Defense Examination, I certify that I have read and evaluated the Thesis prepared by Teklehaimanot Gereziher and examined the candidate. I recommend that the thesis be accepted as fulfilling the Thesis requirements for the degree of Master’s in Maternity and Neonatal Nursing.

_____	_____	_____
Chair Person	Signature	Date

_____	_____	_____
Internal Examiner	Signature	Date

_____	_____	_____
External Examiner	Signature	Date

Final approval and acceptance of the Thesis is contingent upon the submission of its final copy to the Council of Graduate Studies (CGS) through the Candidate’s Department or School Graduate Committee (DGC or SGC).

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By my signature below, I declare and affirm that this thesis is my own work. I have followed all the ethical and technical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. Any scholarly matter that is included in the thesis have been given recognition through citations. I affirm that I have cited and referenced all sources used in this document. Every serious effort has been made to avoid any plagiarism in the preparation of this thesis.

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Name: Teklehaimanot Gereziher

Signature _____

Date: _____

School/Department: Nursing and Midwifery

BIOGRAPHICAL SKETCH

I was born in June 14, 1983 E.C in Humera town, Tigray. I attended my primary education at Lemeat Elementary School, Secondary and Preparatory education at Humera School. I graduated my BSc Degree in Nurse from Mekelle University. I have five-year work experience.

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ACRONYMS AND ABBREVIATIONS

ANC	Ante Natal Care
AOR	Adjusted Odds Ratio
AUCSH	Aksum University Comprehensive Specialized Hospital
COR	Crude Odds Ratio
DM	Diabetes Mellites
EDHS	Ethiopian Demographic Health Survey
SGS	School of Graduate Studies
SPSS	Statistical Package for Social Science
TRHB	Tigray Regional Health Bureau
WHO	World Health Organization

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ABSTRACT

Background: Preeclampsia is a pregnancy-specific hypertensive disorder which usually occurs after 20 weeks of gestation and affects both mother and fetus. In Ethiopia, preeclampsia is one of the five major obstetric causes of maternal mortality, and the proportion of maternal mortality from severe preeclampsia or eclampsia shows an increasing trend. As far as my knowledge there is no study done in the actual study area and there are also limited studies which done in Tigray, Ethiopia regarding determinants of preeclampsia.

Objective: The aim of this study is to assess determinants of preeclampsia among women attending delivery services in public hospitals in central zone, Tigray, Northern Ethiopia, March 01 to 30/2019.

Methods: Hospital based case control study design was employed. Women diagnosed with preeclampsia were cases and women who had no diagnosed for preeclampsia were controls admitted to the same hospitals. The case to control ratio was 1:3. Convenient sampling technique was used to select the study participants for both cases and controls. Interviewer administered semi-structured questionnaire was used to collect data. The data were entered in EPI data 3.1 statistical software, and then exported to SPSS Version 22 for cleaning and analysis. Descriptive statistics were used to describe the data in relation to relevant variables. Bivariable and multivariable logistic regression model was used for analysis.

Results: Family history of hypertension (AOR: 2.60; 95% CI: 1.15, 5.92), family history of preeclampsia (AOR: 5.24; 95% CI: 1.85, 14.80), history of diabetes mellitus (AOR: 4.31; 95% CI: 1.66, 11.21), anemia (AOR: 3.23; 95% CI: 1.18, 8.86), history of preeclampsia on prior pregnancy (AOR: 5.55; 95% CI: 1.80, 17.10), primigravida (AOR: 5.41; 95% CI: 2.85, 10.29), drinking alcohol during pregnancy (AOR: 4.06; 95% CI: 2.20, 7.52) and vegetable intake during pregnancy (AOR: 0.39; 95% CI: 0.21, 0.74) were significantly associated with preeclampsia.

Conclusion: Family history of hypertension, family history of preeclampsia, history of diabetes mellitus, anemia, history of preeclampsia on prior pregnancy, primigravida, drinking alcohol during pregnancy were found to be risk factors for preeclampsia. However, vegetable intake during pregnancy was found to be a protective factor for the development of preeclampsia.

Key words: *Determinants, Preeclampsia, Pregnant Women, Tigray, Ethiopia.*

1 INTRODUCTION

1.1 Background

Preeclampsia is a pregnancy-specific hypertensive disorder which usually occurs after 20 weeks of gestation and affects both mother and fetus (American College of Obstetricians and Gynecologists, NOVEMBER 2013).

Preeclampsia is one of the leading causes for the admission of pregnant women to intensive care units in the world (Roberts and Gammill, 2005). Annually, it also accounting for about 50,000 maternal mortality worldwide (Duley, 2009).

According to the World Health Organization (WHO) estimated the incidence of preeclampsia is seven times higher in developing countries (2.8% of live births) than in developed countries (0.4%) (Trogstad et al., 2008), In developing countries where maternal services including prenatal care are limited, particularly in sub-Saharan Africa, preeclampsia is the leading causes of high neonatal and maternal mortality (Bezerra et al., 2010). Preeclampsia occurs in up to 5% of all pregnancies, in 10% of first pregnancies and in 20–25% of women with a history of chronic hypertension (Shamsi et al., 2010).

A study from Western Shoa showed that the maternal mortality from hypertension disorder of pregnancy was 12.3% (Garomssa and Dwivedi, 2008). According the Ethiopian national emergency obstetric and newborn care indicated that preeclampsia is one of the contributed for the complication of all deliveries and pregnancies, was approximately 1% and 5% respectively. Furthermore, direct maternal mortality and of all maternal mortality from preeclampsia/eclampsia was 16% and 10% respectively (Gaym et al., 2011).

In Ethiopia, preeclampsia is one of the five major obstetric causes of maternal mortality, and the proportion of maternal mortality from severe preeclampsia or eclampsia shows an increasing trend (Abdella, 2010). Another report from Felege Hiwot referral Hospital, indicated that the number of women diagnosed to have preeclampsia was increasing at an alarming rate. For example, from 2012 to 2013 occurrence of preeclampsia was increased by 83% from 233 to 426 without any change in the diagnosis and reporting system (FMOH., 2014).

1.2 Statement of the Problem

Annually, approximately 50,000 maternal deaths worldwide out of which 25 % of cases are from intra uterine growth restrictions and in developed countries 15 % are outcome of preterm birth occurred from Preeclampsia (Bell, 2010).

Preeclampsia leads to adverse health consequences, and it is also costly because of the needed medical services to treat pregnant and postpartum women and their infants, who are often born preterm (Obstetricians and Gynecologists, 2013; Medicine, 2007). In United State from the total cost of \$2.18 billion found to the health care system, \$1.03 billion was in maternal health care and \$1.15 billion for infants born from mothers with preeclampsia, and from this about one third of the total \$6.4 billion short-term estimated health care costs for preeclampsia pregnancies (Stevens et al., 2017).

According to the Ethiopia Demographic and Health Survey (EDHS) 2011 and 2016, estimated 676 mothers' death per 100,000 and 412 mothers' death per 100,000 live births respectively, and this results from pregnancy and related causes (Central Statistical Agency (CSA) [Ethiopia] and ICF, 2011; Central Statistical Agency (CSA) [Ethiopia] and ICF., 2016).

Even though, the etiology for pre-eclampsia is still unclear, but there are certain risk factors which are identified by some studies such as; advanced maternal age (Luo and Ma, 2013), illiteracy (Direkvand-Moghadam et al., 2012), nulliparity (Tebeu et al., 2011), twin pregnancy (Smits and Monden, 2011), high maternal body mass index (BMI) (Lewis et al., 2014), family history of hypertension (Dalmáz et al., 2011), renal disease and diabetes mellitus (Tessema et al., 2015). As other evidence also indicated that the risk factor for preeclampsia includes; previous history of preeclampsia (El-Nakhal, 2015; Grum et al., 2017), anemia (Agrawal and Walia, 2014a; Ali et al., 2011), While smoking (Agrawal and Walia, 2014a), alcohol use (Lardoeyt et al., 2013), are also explained as risk factors.

Even if some literature identified a risk factors for preeclampsia, there is no consistency of risk factors among the literatures because of the difference in the health care system and demographic features. As far as my knowledge there is no study done in the actual study area and there are also limited studies which done in Tigray, Ethiopia regarding determinants of preeclampsia. Therefore, the aim of this study is to identify determinants of preeclampsia

among women attending delivery services in public hospitals in central zone, Tigray, Northern Ethiopia.

1.3 Significant of the Study

Preeclampsia is an important public health problem that affects not only the mothers, but also the fetus because it can lead to low birth weight, premature labor, stillbirth. Thus, it is a burden to the health care institutions and health professionals. To control and manage this situation better, complete understanding of the determinants of preeclampsia among women attending delivery services is decisive. Investigating the determinants of preeclampsia among women attending delivery services is very important in order to prevent its devastating maternal morbidity and mortality. The study will help public hospitals of central zone, Tigray Regional Health Bureau (TRHB), and Non-Governmental Organizations who work on health and health related areas. It will have also a significant input for policy makers to improve health care service programs for mothers diagnosed with Preeclampsia. Furthermore, it will use as a baseline for further research. Therefore, the aim of this study is to identify the determinants of preeclampsia among women attending delivery services in public hospitals in central zone, Tigray, Northern Ethiopia.

1.4 Objectives of the Study

1.4.1 General Objective

✓ To assess determinants of preeclampsia among women attending delivery services in public hospitals in central zone, Tigray, Northern Ethiopia, March 01 to 30/2019

1.4.2 Specific Objectives

✓ To identify determinants of preeclampsia among women attending delivery services in public hospitals in central zone, Tigray, Northern Ethiopia

2 LITERATURE REVIEW

2.1 Sociodemographic Factors

A facility-based cross-sectional survey was conducted in multi-country showed that maternal age ≥ 30 years and low educational attainment were the significantly associated with higher risk of pre-eclampsia (Ota et al., 2014). Similarly, a review of published case control and cohort studies conducted in Pakistan on risk factors of Preeclampsia showed that occurrence of preeclampsia was higher with increasing maternal age ≥ 40 (Shamsi et al., 2013).

A case-control study conducted in 2011 to assess risk factors associated with preeclampsia in Gaza Strip indicated that maternal age exceeding 35 years (4.9, 2.07 to 11.60) and education < 9 years were found significantly associated with increased risk of preeclampsia (El-Nakhal, 2015). Additionally, a hospital based cross sectional and case control study conducted in Dessie and Bahir Dar city respectively, found that occurrence of preeclampsia was higher in the older age group ≥ 35 (Tessema et al., 2015; Endeshaw et al., 2016).

In Uganda a case control study, women with educational status of primary or none were independently associated with the preeclampsia (Kiondo et al., 2011). However, a case-control hospital-based study done in Cairo, Egypt showed that low educational level (illiterates, read and write) was not significant risk factor for preeclampsia.

Hospital based case control study conducted in India and China found that preeclampsia was significantly associated with rural residence (Verma et al., 2017; Luo and Ma, 2013). With the same study design conducted in Al-Sbeen Hospital in Sana'a City, Yemen showed that there was a significant association between rural residence and occurrence of preeclampsia (Al-Tairi et al., 2017).

In 2011, a retrospective case-control study conducted in Nigeria to assess factors associated with sever preeclampsia showed that occupation of being housewife was found to be associated with preeclampsia development (Guerrier et al., 2013a). In contrast a case-control study conducted in Gaza Strip revealed that there was no significant association between pregnant mother occupation and preeclampsia development (El-Nakhal, 2015).

2.2 Maternal Medical Disease Factors

A case-control study conducted in South India showed that having family history of hypertension was significantly risk factor for development of preeclampsia (Ganesh et al., 2010; Bej et al., 2013). Moreover, Hospital based case control study conducted at Jaipur, India showed that family history of hypertension and family history of preeclampsia were also factors associated with preeclampsia development (Verma et al., 2017). Similarly, case control study conducted in Kampala, Uganda indicated that family history of hypertension was significantly associated with preeclampsia (Wandabwa et al., 2010).

A case-control study conducted in South India showed that history of DM was also associated with development of preeclampsia (Ganesh et al., 2010). Additionally, a case control study conducted in Gaza Strip indicated that diabetic pregnant women and Previous history of preeclampsia were significantly associated with increased risk of preeclampsia (El-Nakhal, 2015).

Hospital-based case control study done in Yemen indicated that prior preeclampsia and family history of preeclampsia were significantly associated a risk factor for preeclampsia (Al-Tairi et al., 2017). Additionally, Having history of preeclampsia on prior pregnancy was associated with a higher risk of preeclampsia development according to a case control study conducted in Addis Ababa, Ethiopia (Grum et al., 2017).

In 2015, a case control study done in public health facilities of Bahir Dar city showed that family history of hypertension, history of diabetes mellitus were factors associated with preeclampsia development (Endeshaw et al., 2016). Furthermore, cross-sectional study conducted in Arba Minch town and Dessie referral hospital showed that having family history of hypertension and family history of DM were factors associated with preeclampsia development (Shegaze et al., 2016; Tessema et al., 2015). Furthermore, history of prior preeclampsia in previous pregnancy was a significant risk factor for preeclampsia development (Kashanian et al., 2011; Direkvand-Moghadam et al., 2012; Grum et al., 2017).

In 2015, Hospital based case control study conducted at Jaipur, India showed that pregnant women with anemia was significantly associated a risk factor with preeclampsia development (Verma et al., 2017). Furthermore, multi-country, facility-based cross-sectional study showed

that severe anemia was a risk factors for occurrence of preeclampsia (Ota et al., 2014). Similarly, In 2015, a case control study conducted in Bahir Dar city showed that having anemia was associated with risk factor of preeclampsia (Endeshaw et al., 2016). In contrast a retrospective case-control study conducted in Tehran, Iran showed that anemia was protective factor for preeclampsia (Kashanian et al., 2011).

2.3 Maternal Obstetric Factors

A review of published case control and cohort studies done in Pakistan on risk factors of Preeclampsia showed that multiple (twin) pregnancy, nulliparity were a significant risk factors for preeclampsia (Shamsi et al., 2013). A facility-based cross-sectional study conducted in multi-country and a case control study done in Uganda revealed that nulliparity was found to be significant risk factors for Preeclampsia (Ota et al., 2014; Wandabwa et al., 2010). However, a case control study conducted in Sana'a City, Yemen showed that no significant associations between parity and occurrence of preeclampsia (Al-Tairi et al., 2017).

A case control study conducted in South India and Bahir Dar city showed that multiple pregnancy was the significant risk factors for preeclampsia development (Ganesh et al., 2010; Endeshaw et al., 2016). In contrast study conducted in Gaza Strip showed that there was no association between multiple pregnancy and occurrence of preeclampsia (El-Nakhal, 2015).

A case control study conducted in Gaza Strip and Cairo, Egypt to assess risk factors associated with preeclampsia showed that primigravida was significantly associated with risk factors of preeclampsia development (El-Nakhal, 2015; El-Moselhy et al., 2011). Furthermore, in 2016, a case control study conducted in Addis Ababa, Ethiopia showed that primigravida was statistically significant association with preeclampsia (Grum et al., 2017).

A case control study conducted in Uganda showed that delivery of male babies was associated with risk of preeclampsia development (Wandabwa et al., 2010). However, a case control study conducted at Al-Sbeen hospital in Sana'a City, Yemen showed that preeclampsia was not found to be significantly associated with sex of newborn baby (Al-Tairi et al., 2017).

A case control study conducted in Armenia and Cairo, Egypt showed that long intra birth interval (greater than or equal to five years), more than 3 years respectively appeared to be a risk factor for preeclampsia (Harutyunyan et al., 2013; El-Moselhy et al., 2011). In contrast,

hospital-based Case control analytical study conducted at Mahila chikitsalaya, Jaipur, India indicted that there was not an association between inter pregnancy period and occurrence of preeclampsia (Verma et al., 2017).

A case control study conducted in Kampala, Uganda found that a woman who have history of abortion in the previous delivery was higher risk of developing preeclampsia (Wandabwa et al., 2010). Similarly, a hospital-based case control study conducted at Al-Sbeen hospital in Sana'a City, Yemen indicated that history of previous abortion have a significant association with preeclampsia development (Al-Tairi et al., 2017). However, a case control analytical study conducted at Mahila chikitsalaya, Jaipur, India indicated that there was not a significant association between history of previous abortion and development of preeclampsia (Verma et al., 2017).

Regarding to the planning of pregnancy between the case and control group there was no significant difference on the occurrence of preeclampsia according to the case control study conducted in Yerevan, Armenia (Harutyunyan, 2009). Additionally, a case control study conducted in Addis Ababa found that there was no significant association between pregnancy planning and preeclampsia development (Grum et al., 2017)

2.4 Maternal Behavioral Factors

In 2015, a case control analytical study conducted in Jaipur, India showed that non-vegetative diet women was found to be significantly associated with risk factor of preeclampsia development (Verma et al., 2017). Similarly, a case-control study conducted in Cairo, Egypt showed that no adequate intake of fresh fruits and vegetables was significant risk factors for preeclampsia development (El-Moselhy et al., 2011). Moreover, a case control study done in Addis Ababa and Bahir Dar city showed that women who have taken fruit and vegetables during pregnancy were more likely to be protected from the development of preeclampsia (Endeshaw et al., 2015; Grum et al., 2017).

A retrospective case control study conducted in Tehran, Iran indicted that oral contraceptive pill was found to be protective factor for pre-eclampsia (Kashanian et al., 2011). In contrast a cross sectional predictive study conducted in Iran showed that there was no association between type of contraceptive and occurrence of preeclampsia (Direkvand-Moghadam et al., 2012).

A case control study conducted in western China showed that fewer Antenatal Care (ANC) visits was significant associated with the risk factor of preeclampsia (Luo and Ma, 2013). Similarly, a retrospective case-control study done in Nigeria indicated that fewer than four antenatal clinic visits was found to be significantly associated risk factor for preeclampsia (Guerrier et al., 2013b). However, a case control study conducted in Jaipur, India showed that there was no significant association between preeclampsia development and ANC characteristics (Verma et al., 2017).

A cross-sectional survey conducted in India on the prevalence and risk factor for symptoms suggestive of preeclampsia indicated that there was no significant association between alcohol drink during pregnancy and development of preeclampsia (Agrawal and Walia, 2014b). In contrast, in 2015, a case control study conducted in Addis Ababa, Ethiopia showed that alcohol intake during pregnancy was a significant risk factor for pre-eclampsia (Grum et al., 2017). Additionally, a cross-sectional study conducted in Arba Minch town, in 2016, indicated that significant association between alcohol drinking during pregnancy and development of preeclampsia (Shegaze et al., 2016).

2.5 Conceptual Framework

This conceptual frame work was developed after reviewing different related literatures (Grum et al., 2017; Endeshaw et al., 2015; El-Moselhy et al., 2011). As we can see in the frame work, there are different factors lead to preeclampsia. The factors can be generally grouped in to four categories: Socio-demographic factors, medical disease factors, maternal obstetric factors and maternal behavior factors during pregnancy.

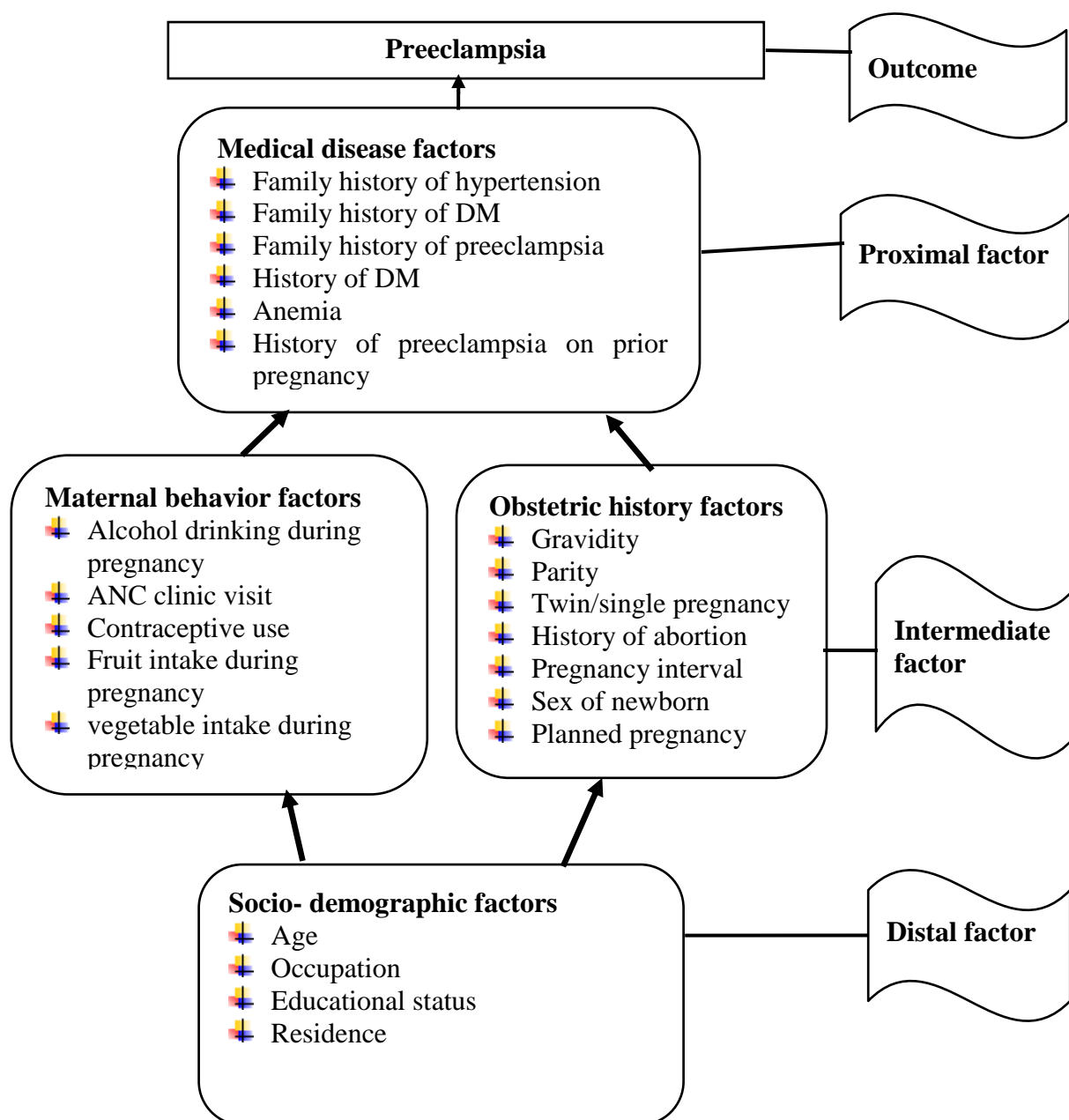


Figure 1: Conceptual framework and variable specification for a study was conducted in public hospitals in central zone, Tigray, Northern Ethiopia, 2019

3 METHODS AND MATERIALS

3.1 Study Area and Period

The study was conducted in public hospitals of central zone, which is one of the seven zones in Tigray. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia, the zone has a total population of 1,245,824, of those 613,797 are men and 632,027 women; 176,453 or 14.16% are urban inhabitants (Agency and FDRoECS., 2013). In central zone there are four public Hospitals; Aksum University Comprehensive Specialized Hospital (AUCSH), Saint Marry General Hospital, Adwa General Hospital and Abyi Adi General Hospital. Aksum town is the capital city of central zone and has two public hospitals. The Saint Marry Hospital is one of earliest district Hospital found in the town and with the newly innovated University Comprehensive Specialized Hospital. The other two hospitals of the zone found in each town of Adwa and Abyi Adi. The study period was from March 01 to 30/2019.

3.2 Study Design

Hospital based case control study design was conducted.

3.3 Source Population

The source population was all women attending delivery service in public hospitals in central zone, Tigray, Ethiopia.

3.4 Study Population

Cases: All woman attending delivery services diagnosed with preeclampsia in public hospitals in central zone, Tigray during the study period

Controls: Women attending delivery services at the same hospitals diagnosed without preeclampsia during the study period.

3.5 Eligibility Criteria

3.5.1 Inclusion Criteria

Cases: Women attending delivery service diagnosed with preeclampsia

Controls: Women attending delivery service diagnosed without preeclampsia

3.5.2 Exclusion Criteria

Critically ill mothers were excluded from the study.

3.6 Sample Size Determination

EPI Info software version 7.1.1 was used to calculate the sample size using double population proportion formula to estimate the sample size required for unmatched case control study. The following assumptions were considered to estimate the required sample size for the study; A 95% confidence level, 80% power, primigravida as a risk factor with lowest odds ratio of 2.16 and Proportion of controls with exposure 39% (Essam A. El-Moselhy, 2011). Case to control ratio of 1:3 was employed. The final estimated sample size with assuming of 10% non-response rate was 344 which includes 86 cases and 258 controls.

3.7 Sampling Procedure /Technique

There are three general and one Comprehensive Specialized Public Hospitals in central zone of Tigray namely Aksum St. Marry General Hospital, Adwa General Hospital, Abyi Adi General Hospital and AUCSH. The cases and controls were recruited by using convenient sampling technique from the four public hospitals until the required sample size is fulfilled. Confirmation of preeclampsia diagnosis was taken from the documentation. According to the 2017/2018 G.C health management information system report, AUCSH has an annual delivery of 2400, St. Marry General Hospital has an annual delivery of 2889, Adwa General Hospital has an annual delivery of 2832 and Abyi Adi General Hospital has annual delivery of 1632. Total annual delivery in the four public Hospitals = $2400+2889+2832+1632 = 9,753$. So, the sample size allocated for each hospital was;

For AUCSH = $2400*344/9753 = 84$ (21 cases and 63 controls)

For St. Marry hospital = $2889*344/9753 = 104$ (26 cases and 78 controls)

For Adwa hospital = $2832*344/9753 = 100$ (25 cases and 75 controls)

For Aby Adi hospital = $1632*344/9753 = 56$ (14 cases and 42 controls)

Accordingly, the 84 samples for AUCSH, 104 samples for St. Marry Hospital, 100 samples for Adwa Hospital and 56 samples for Abyi Adi Hospital was assigned.

3.8 Data Collection Methods

3.8.1 Data Collection Instruments: The questionnaire was adapted from different related literature including, WHO and EDHS reports related to preeclampsia. A translated to Tigrigna version questionnaire was used for collecting data.

3.8.2 Data Collection Procedure: Data were collected using interviewer administered semi-structured, pretested questionnaires and recorded data. Record review of participant's was conducted to identify cases and controls from record data. variables such as preeclampsia and anemia were collected from the record review card. After cases and controls were differentiated, data were collected from record review and interview of women immediately after delivery. The participants were women who came for delivery service for both groups in public hospitals in central zone, Tigray, Ethiopia.

3.8.3 Data Collectors: Eight BSc completed in midwifery and two BSc completed in Nurse were recruited for data collection and supervision respectively. Continuous follow up and supervision was made by the supervisors and principal investigator throughout the data collection period. All participants were evaluated and privately interviewed.

3.9 Variables

3.9.1 Dependent Variable

Preeclampsia

3.9.2 Independent Variables

Maternal socio demographic factors: Age, religion, ethnicity, occupation, educational status, marital status, residence.

Medical disease factors: Family history of hypertension, family history of DM, family history of preeclampsia, history of DM, anemia and history of preeclampsia on prior pregnancy

Obstetric history factors: Gravidity, parity, planned pregnancy, twin/single pregnancy, history of previous abortion, pregnancy interval, sex of newborn

Maternal behavior factors: Contraceptive use, alcohol drinking during pregnancy, ANC clinic visit, fruit intake during pregnancy and vegetable intake during pregnancy

3.10 Operational Definition

Gravida: Refers to the number of times a woman has been pregnant, regardless of the pregnancy outcome (Cunningham et al., 2014).

Parity: Is the number of births that a woman had after 28 weeks of gestation (Cunningham et al., 2014).

Preeclampsia: Pregnant woman who develops blood pressure ≥ 140 mm Hg systolic or ≥ 90 mm Hg diastolic on two separate readings taken at least four hours apart after 20 weeks gestation of pregnancy in an individual with previously normal blood pressure and proteinuria is greater than or equal to 300mg per 24-hour urine collection or dipstick reading of 1+ (ACOG, 2014).

3.11 Data Quality Assurance

To assure data quality, the questionnaire was initially prepared in English then translated into the local language (Tigrigna) by an individual who had good ability of the two-language translation, and then translated back to English by an individual which have good ability in translation to ensure consistency. Training was given by principal investigator for data collectors and supervisor in Aksum town for two days. The questionnaire was pre-tested on five percent of the total sample size in Suhul General Hospital one week before the actual data collection period and necessary amendment was done on the questionnaire according to pre-test result. The collected data was reviewed and checked for completeness and consistency by supervisor and principal investigator on daily bases at the spot during data collection time.

3.12 Methods of Data Analysis

The Data were cleaned, entered and edited using EPI data version 3.1 statistical software, and then exported to SPSS Version 22 for analysis. Descriptive statistics were used to characterize the sample and numerical data was presented as frequency, proportion or percentages. Bivariable was employed to examine the statistical association between the outcome variable and independent variables. Variables which were at p-value ≤ 0.25 in bivariable analysis were entered into multivariable logistic regression to isolate an independent effect of the predictors. The Hosmer-Lemen show test was used to check the appropriateness of the model for analysis. Multicollinearity was assessed by variance inflation factor (VIF). Multivariable logistic regression analysis was carried out to evaluate the combined effect of several factors associated with preeclampsia after adjusting for confounding variables. Adjusted odds ratios (AOR) with 95% CI, was used to express the magnitude of the effect of each category on the outcome relative to the reference category. P Value < 0.05 was used to determine the level of statistical significance.

3.13 Ethical Consideration

Ethical clearance was secured from Haramaya University College of Health and Medical Sciences Institutional Health Research Ethics Review Committee (IHRERC). Official permission was obtained from TRHB to the respected hospitals. Informed, voluntary, written and signed consent was obtained from heads of Hospitals and each participant for data collection after explaining the purpose and benefits of the study. Data collectors inform to the participants that they have full right to discontinue or refuse to participate in the study. A letter of agreement was also attached to the questionnaire to obtain the permission of each individual. Information was recorded anonymously and confidentiality also was assured throughout the study period.

3.14 Information Dissemination

The result of this study will be presented to Haramaya University College of health and Medical Sciences department of Nursing and Midwifery, finding will be disseminated to study area hospitals and TRHB research unit. Moreover, efforts will be made to publish the paper in scientific journals.

4 RESULTS

4.1 Socio-demographic Characteristics of Study Participants

In this research, a total of 86 women who had preeclampsia (cases) and 258 women who had no preeclampsia (controls) were completed the interview with a response rate of 100%. Sixty-four (74.4%) of the cases and 200(77.5%) of the controls were in the age group of 20 to 34.

Eighty-five (98.8%) of the cases and 255 (98.8%) of the controls were Tigrayan by ethnicity. Eighty-three (96.5%) cases and 223 (86.4%) controls were orthodox Christians by religion, and Fifty-two (60.5%) cases and 175(67.8%) controls were living in urban area. Eighty (93.0%) cases and 246 (95.3%) controls were found married or living together with their partner. Concerning occupational status of study participants, fifty-four (62.8%) cases and 137 (53.1%) controls were found to be house wife. Regarding the educational status, 32 (37.2%) of the cases and 95 (36.8%) of the controls completed primary school (Table 1).

Table 1: Socio-demographic characteristics of women attending delivery service in public hospitals in central zone, Tigray, Northern Ethiopia, 2019

Variables	Category	Case	Control
		Number (%)	Number (%)
Age	<20	9(10.5%)	26(10.1%)
	20-34	64(74.4%)	200(77.5%)
	≥35	13(15.1%)	32(12.4%)
Ethnicity	Tigray	85(98.8%)	255(98.8%)
	Amhara	1(1.2%)	3(1.2%)
Religion	Orthodox	83(96.5%)	223(86.4%)
	Muslim	3(3.5%)	35(13.6%)
Residence	Urban	52(60.5%)	175(67.8%)
	Rural	34(39.5%)	83(32.2%)
Occupation	House wife	54(62.8%)	137(53.1%)
	Merchant	16(18.6%)	63(24.4%)
	Government Employee	11(12.8%)	45(17.4%)
	Others	5(5.8%)	13(5.0%)
Marital status	Never married	6(7.0%)	6(2.3%)
	Married/Living together	80(93.0%)	246(95.3%)
	Separated	0(0.0%)	6(2.3%)
Educational status	No formal education	10(11.6%)	31(12.0%)
	Primary	32(37.2%)	95(36.8%)
	Secondary	24(27.9%)	79(30.6%)
	Technical/Vocational	15(17.4%)	25(9.7%)
	Higher education	5(5.8%)	28(10.9%)

4.2 Medical Disease History of Study Participants

Of the total participants, 15(17.4%) cases and 26(10.1%) controls had family history of hypertension, and 7(8.1%) cases and 6(2.3%) controls had family history of diabetes mellitus. Thirteen (15.1%) cases and 12(4.7%) controls had family history of preeclampsia. Eleven (12.8%) cases and 16(6.2%) controls were found having history of diabetes mellitus, while 10(11.6%) cases and 14(5.4%) controls were found having anemia. Nine (10.5%) cases and 14(5.4%) controls had history of preeclampsia on prior pregnancy (Table 2).

Table 2: Disease status of women attending delivery service in public hospitals in central zone, Tigray, Northern Ethiopia, 2019

Variables	Category	Cases	Controls
		Number (%)	Number (%)
Family history of hypertension	Yes	15(17.4%)	26(10.1%)
	No	71(82.6%)	232(89.9%)
Who had history of hypertension	Father	2(13.3%)	9(34.6%)
	Mother	11(73.3%)	7(26.9%)
	Brother	2(13.3%)	6(23.1%)
	Sister	0(0.0%)	4(15.4%)
Family history of DM	Yes	7(8.1%)	6(2.3%)
	No	79(91.9%)	252(97.7%)
Who had history of DM	Father	3(42.9%)	2(33.3%)
	Mother	2(28.5%)	2(33.3%)
	Brother	1(14.3%)	0(0.0%)
	Sister	1(14.3%)	2(33.3%)
Family history of preeclampsia	Yes	13(15.1%)	12(4.7%)
	No	73(84.9%)	246(95.3%)
Who had history of preeclampsia	Mother	12(92.3%)	6(50.0%)
	Sister	1(7.7%)	6(50.0%)
History of DM	Yes	11(12.8%)	16(6.2%)
	No	75(87.2%)	242(93.8%)
Diagnosed with anemia	Yes	10(11.6%)	14(5.4%)
	No	76(88.4%)	244(94.6%)
history of preeclampsia on prior pregnancy	Yes	9(10.5%)	14(5.4%)
	No	77(89.5%)	244(94.6%)

4.3 Obstetric History Characteristics of Study Participants

Of the total participants, 50(58.1%) of the cases and 88(34.1%) of the controls were primigravida, and 30(83.3%) cases and 141(82.9%) controls were found with inter pregnancy interval <3 years. Seventy- four (86.0%) cases and 235(91.1%) controls reported that their pregnancy was planned. Eighty-one (94.2%) cases and 251(97.3%) controls had singleton birth. Of the total participants, 52(60.5%) of the cases and 137(53.1%) of the controls had male baby (Table 3).

Table 3: Obstetric history of women attending delivery service in public hospitals in central zone, Tigray, Northern Ethiopia, 2019

Variables	Category	Cases	Controls
		Number (%)	Number (%)
Gravidity	Primigravida	50(58.1%)	88(34.1%)
	Multigravida	36(41.9%)	170(65.9%)
History of Abortion	Yes	7(19.4%)	22(12.9%)
	No	29(80.6%)	148(87.1%)
Number of abortions	1	5(71.4%)	21(95.5%)
	≥2	2(28.6%)	1(4.5%)
Parity	Nullipara	50(58.1%)	88(34.1%)
	One delivery	11(12.8%)	54(20.9%)
	Multipara	25(29.1%)	116(45.0%)
Planned pregnancy	Yes	74(86.0%)	235(91.1%)
	No	12(14.0%)	23(8.9%)
Multiplicity of pregnancy	Singleton	81(94.2%)	251(97.3%)
	Twin	5(5.8%)	7(2.7%)
Sex of new born	Male	52(60.5%)	137(53.1%)
	Female	34(39.5%)	121(46.9%)
Pregnancy interval	<3Year	30(83.3%)	141(82.9%)
	≥3Year	6(16.7%)	29(17.1%)

4.4 Pregnancy Behavior Characteristics of Study Participants

Of the total participants, 38(44.2%) cases and 51(19.8%) controls reported that they drink alcohol during their current pregnancy. Eighty (93.0%) of the cases and 247 (95.7%) of the controls attended ANC at least once for their current pregnancy, while 5(6.3%) of the cases and 34(13.8%) of the controls had 4 and more visits. Forty-seven (54.7%) of the cases and 177(68.6%) of the controls were using modern contraceptive before this pregnancy. Fifty-eight (67.4%) of the cases and 214(82.9%) of the controls reported to have had fruit intake during this pregnancy, and 56(65.1%) cases and 212 (82.2%) controls reported they used vegetable (Table 4).

Table 4: Behavior factors of pregnant women attending delivery service in public hospitals in central zone, Tigray, Northern Ethiopia, 2019

Variables	Category	Cases	Controls
		Number (%)	Number (%)
Alcohol intake	Yes	38(44.2%)	51(19.8%)
	No	48(55.8%)	207(80.2%)
Attending ANC	Yes	80(93.0%)	247(95.7%)
	No	6(7.0%)	11(4.3%)
Frequency of Attending ANC	<4	75(93.8%)	213(86.2%)
	≥4	5(6.3%)	34(13.8%)
Use of modern contraceptive	Yes	47(54.7%)	177(68.6%)
	No	39(45.3%)	81(31.4%)
Fruit intake	Yes	58(67.4%)	214(82.9%)
	No	28(32.6%)	44(17.1%)
Frequency of Fruit intake per week	Daily	6(10.3%)	8(3.7%)
	1-6 days/week	52(89.7%)	206(96.3%)
Vegetable intake	Yes	56(65.1%)	212(82.2%)
	No	30(34.9%)	46(17.8%)
Frequency of vegetable intake per week	Daily	3(5.4%)	3(1.4%)
	1-6 days/week	53(94.6%)	209(98.6%)

In bivariable analysis, independent variables such as age, ethnicity, residence, occupation, marital status, educational status, family history of hypertension, history of diabetes mellitus, anemia, history of preeclampsia on prior pregnancy, history of abortion, planned pregnancy, multiplicity of mother's pregnancy, sex of newborn, ANC, pregnancy interval did not show any significant association with the development of preeclampsia.

However, taking fruit during pregnancy was associated with preeclampsia with COR: 0.43 (95%, CI: 0.24, 0.74) but the association disappeared on multivariable analysis. Similarly, modern contraceptive was associated with preeclampsia on bivariable analysis.

After considering all assumptions of binary logistic regression, those variables which had p-value ≤ 0.25 at bivariable analysis entered into multivariable logistic regression. In the multivariable logistic regression analysis, eight variables are identified as determinants of preeclampsia among women attending delivery services at 5% level of significance.

The multivariable analysis revealed that women who had family history of hypertension had 2.60 times higher risk of preeclampsia compared to women who had no family history of hypertension (AOR: 2.60 at 95% CI: 1.15, 5.92). Those who had history of DM had 4.31 times higher risk of developing preeclampsia compared to women who had no history of DM (AOR: 4.31 at 95% CI: 1.66, 11.21).

The pregnant women who had family history of preeclampsia were 5.24 times more likely to develop preeclampsia than those who had no family history of preeclampsia (AOR: 5.24 at 95% CI: 1.85, 14.80). Women who had anemia also showed relationship with preeclampsia among pregnant women. The odd of developing preeclampsia was 3.23 times associated in those who had anemia than those who had no anemia (AOR: 3.23 at 95% CI: 1.18, 8.86).

The participants with history of preeclampsia on their prior pregnancy were strongly associated with preeclampsia development. The odds of developing preeclampsia, was 5.55 times higher for women with history of preeclampsia comparing to women who had no history of preeclampsia (AOR: 5.55 at 95% CI: 1.80, 17.10).

From factors related to the obstetric history of pregnant women, primigravida was found to be risk factor for preeclampsia on the multivariable analysis. The odds of developing

preeclampsia, was 5.41 times higher in women with primigravida comparing to the women with multigravida (AOR: 5.41 at 95% CI: 2.85, 10.29).

In the multivariable analysis, women who reported drinking alcohol during their pregnancy period had an increased risk of preeclampsia as compared to those women who did not drink alcohol (AOR: 4.06 at 95% CI= 2.20, 7.52). Women who reported to have taken fruit during pregnancy were found to be a protective for preeclampsia in the bivariable analysis. But, the effect did not remain significant after adjusting for potential confounding variables. However, women who reported taking vegetable during pregnancy was found to be a protective factor for preeclampsia in the multivariable analysis.

Table 5: The bivariable and multivariable analysis of determinants of preeclampsia for women attending delivery service in public hospitals in central zone, Tigray, Ethiopia, 2019

Variables	Category	Cases Number (%)	Controls Number (%)	COR (95% CI)	AOR (95%: CI)
Family history of DM	Yes	7(8.1%)	6(2.3%)	3.72(1.21, 11.40)	3.45(0.92,12.90)
	No	79(91.9%)	252(97.7%)	1	1
Use of modern contraceptive	Yes	47(54.7%)	177(68.6%)	0.55(0.33,0.91)	0.65(0.36,1.17)
	No	39(45.3%)	81(31.4%)	1	1
Family history of hypertension	Yes	15(17.4%)	26(10.1%)	1.88(0.95,3.75)	2.60(1.15,5.92)*
	No	71(82.6%)	232(89.9%)	1	1
Family history of preeclampsia	Yes	13(15.1%)	12(4.7%)	3.65(1.60, 8.35)	5.24(1.85,14.80)*
	No	73(84.9%)	246(95.3%)	1	1
History of DM	Yes	11(12.8%)	16(6.2%)	2.22(0.99,4.99)	4.31(1.66,11.21)*
	No	75(87.2%)	242(93.8%)	1	1
Diagnosed with anemia	Yes	10(11.6%)	14(5.4%)	2.29(0.98, 5.37)	3.23(1.18,8.86)*
	No	76(88.4%)	244(94.6%)	1	1
history of preeclampsia on prior pregnancy	Yes	9(10.5%)	14(5.4%)	2.04(0.85, 4.89)	5.55(1.80,17.10)*
	No	77(89.5%)	244(94.6%)	1	1
Gravidity	Primigravida	50(58.1%)	88(34.1%)	2.68(1.63, 4.42)	5.41(2.85,10.29)**
	Multigravida	36(41.9%)	170(65.9%)	1	1
Alcohol drinking	Yes	38(44.2%)	51(19.8%)	3.21(1.90, 5.43)	4.06(2.20,7.52)**
	No	48(55.8%)	207(80.2%)	1	1
Fruit intake	Yes	58(67.4%)	214(82.9%)	0.43(0.24, 0.74)	0.89(0.37,2.10)
	No	28(32.6%)	44(17.1%)	1	1
Vegetable intake	Yes	56(65.1%)	212(82.2%)	0.40(0.23,0.70)	0.39(0.21,0.74)*
	No	30(34.9%)	46(17.8%)	1	1

NB: * → p-value < 0.05

**→ p-value < 0.001

5 DISCUSSION

The study provides information about the determinants of preeclampsia among pregnant women attending delivery service in public hospitals in Central Zone, Tigray, Ethiopia in 2019. This study found that family history of hypertension, family history of preeclampsia, history of DM, anemia, primigravida, history of preeclampsia on prior pregnancy and alcohol drinking during pregnancy as risk factors, whereas taking vegetable during pregnancy was a protective factor for preeclampsia.

Those who had family history of hypertension were significantly associated with preeclampsia among pregnant women. The odds of developing preeclampsia, was 2.60 times more than those who had no family history of hypertension. This finding is also consistent with other studies conducted in Ethiopia, Uganda and South India (Endeshaw et al., 2016; Wandabwa et al., 2010; Ganesh et al., 2010).

History of DM showed significant association with preeclampsia among pregnant women than those who had no history of DM. Those who had history of DM were 4.31 times more related to develop preeclampsia compared to their counterparts. This finding was supported by different studies conducted in different countries; such as, South India, Gaza Strip and Ethiopia (Ganesh et al., 2010; El-Nakhal, 2015; Endeshaw et al., 2016). This is explained by epidemiological and clinical data document has shown that DM is closely associated with insulin resistance (Wolde et al., 2011). In addition, hyperinsulinemia is stimulating the proliferation of vascular smooth muscle cells, enhance acute sympathetic nervous system activity and modify transmembrane cation transport, as well as renal sodium retention, release of the potent vasoconstrictor angiotensin II, and associated endothelial dysfunction. All of these alterations may contribute to blood pressure elevation and thus preeclampsia (Polyzos et al., 2010).

In this study, multivariable analysis revealed that family history of preeclampsia was significantly associated with preeclampsia development. Women who had family history of preeclampsia were with the odds of 5.24 times higher to develop preeclampsia than their counterparts. This finding was in agreement with the study conducted in India, and Yemen (Verma et al., 2017; Al-Tairi et al., 2017). This might have occurred because of genetic and/or

behavioral factors that contribute to the pathophysiologic susceptibility of preeclampsia that cluster in families (Chappell et al., 2015).

The participants who diagnosed with anemia were significantly associated with preeclampsia development. The odds of developing preeclampsia among women diagnosed with anemia was 3.23 times more than women who had no anemia. Similarly, other studies conducted in India and Ethiopia reported that anemia was significantly associated with preeclampsia (Verma et al., 2017; Endeshaw et al., 2016). Contrary to this, the study conducted in Iran showed that anemia was protective for pre-eclampsia (Kashanian et al., 2011). This difference could be due to variation in sample size and study participants. The participants in Iran study were excluded those who are over 35 years of age or below 18 years of age, history of any maternal disease including diabetes unlike of this study.

Those participants who had history of preeclampsia on prior pregnancy had 5.55 times higher risk of developing preeclampsia than their counterparts. This finding is supported with studies conducted in Gaza Strip, Yemen and Ethiopia (El-Nakhal, 2015; Al-Tairi et al., 2017; Grum et al., 2017). This showed that women with history of preeclampsia on their previous pregnancy need to have a focus and could be an acceptable means of screening for pre-eclampsia, especially in limited resourced locations.

This study showed that primigravida was found independently associated with preeclampsia development. The odds of developing preeclampsia in primigravida women were 5.41 times higher than multigravida women. This finding is consistent with studies conducted in Gaza Strip, Egypt and Ethiopia (El-Nakhal, 2015; El-Moselhy et al., 2011; Grum et al., 2017), as they declared that primigravida was a risk factor for preeclampsia. Preeclampsia generally considered a disease of the first pregnancy (Harutyunyan, 2009) which is due to the immunological incompetence seen in first pregnancy between fetoplacental and maternal tissues (Sibai BM, 2003).

Alcohol consumption also showed association with preeclampsia development among pregnant women. The odds of developing preeclampsia, was 4.06 times more common among women who had drink alcohol than those who didn't drink alcohol. This finding is consistent with study conducted in Ethiopia (Grum et al., 2017; Shegaze et al., 2016). In contrast this

finding, a study conducted in India (Agrawal and Walia, 2014a), was found that no significant association between alcohol drinking during pregnancy and preeclampsia. Unlike the current study, a cross sectional study conducted in India was based on the women's report of clinical manifestation for preeclampsia and were not diagnosed by physicians. The discrepancy could be due to the difference of study design and study subjects.

Those participants who reported consumption of vegetables had 61% lower risk of developing preeclampsia than their counterparts. This finding is supported with other studies conducted in Ethiopia (Endeshaw et al., 2015; Grum et al., 2017). This is because of vegetables are rich in micronutrients such as antioxidants, vitamins, minerals and dietary fiber. A diet rich in vegetables decreased the risk of hyperhomocysteinaemia, which is one of the risk factors for the occurrence of pre-eclampsia (Wen et al., 2013).

6 STRENGTH AND LIMITATION OF THE STUDY

6.1 Strength of the Study

- ✚ High response rate (100%)
- ✚ Using standard structured questionnaire adapted from WHO, EDHS

6.2 Limitation of the study

- ✚ Diagnosis for preeclampsia used from documentation data.
- ✚ Recall bias might be introduced.

7 CONCLUSION AND RECOMMENDATION

7.1 Conclusion

The results of this study suggest that there are protective and risk factors for preeclampsia. Factors such as family history of hypertension, family history of preeclampsia, history of DM, diagnosed with anemia, history of preeclampsia on prior pregnancy, primigravida, drinking alcohol during pregnancy were found to be risk factors for preeclampsia. However, vegetable intake during pregnancy was found to be a protective factor for the development of preeclampsia.

7.2 Recommendation

- ✚ Health care providers should give advice for the pregnant women:
 - ✓ To take vegetable for those who not eat vegetable during their pregnancy
 - ✓ To avoiding drinking alcohol for those who drink alcohol during pregnancy
- ✚ Another research should be carried out to investigate the determinants of preeclampsia among pregnant women in a broader large area and in a larger sample size

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9 ANNEXES

9.1 Institution Information Sheet and Voluntary Informed Consent form for Medical Director of _____ Hospital

Hello, my name is _____. I am working as data collector for the study being conducted in this Hospital by **Teklehaimanot Gereziher** who is studying his Master's degree at Haramaya University, College of Health and medical Sciences. So, I kindly request you to give me time to explain about importance of the study, ethical issues and how the study will be conducted in your hospital.

Study Title: Determinants of preeclampsia among women attending delivery services in public hospitals in central zone, Tigray, Northern Ethiopia.

Purpose of the study: The findings of this study can be of a paramount importance for the Hospital to identify determinants for preeclampsia to find the way for decreasing both preeclampsia occurrence and risk of its death that contributes for maternal and infant mortality and morbidity significantly. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of a master's program in Maternity and Neonatal Nursing for the principal investigator.

Procedure and duration: I will be interviewing the participants using questionnaire to provide me with pertinent data that is helpful for the study. There are 36 questions to answer where I will fill the questionnaire by interviewing the women. The question that is going to be asked usually takes about 20 minutes.

Risk and benefit: The risk of being participated in this study is very minimal, but only taking few minutes from the participants time. There is no direct benefit for participating in this study now. However, the result of the study, will be helpful for all population in the future by identifying the determinants that contribute to preeclampsia which is useful in delivering improved health care services.

Confidentiality: The information that we will be provided will be kept confidential. There will be no information that will identify the participants in particular. The findings of the study will be general for the study area and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link participants to the study.

Rights: Participation for this study is fully voluntary. The participants have the right to declare to participate or not in this study. If they decide to participate, they have the right to withdraw from the study at any time and this will not label them for any loss of benefits which they otherwise are entitled. They do not have to answer any question that they do not want to answer.

Contact address: If there are any questions or enquires any time about the study or the procedure or anything else related to the study, please contact through the following address:

Teklehaimanot Gereziher: Mobile number (+251)-930928823.

Email Address: teklehaimg@gmail.com

Institutional Health Research Ethics Review Committee (IHRERC) Haramaya University:

Office phone: (+251)-0254662011 or P.O. Box: 235, Harar

Declaration of informed voluntary consent:

I have read the participant information sheet, I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any questions. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that participants have the right to withdraw from the study at any time or not to answer any question that they do not want. I am also informed that the Hospital has the right to stop this study from being conducted if any misdeeds and unethical procedures are observed during the data collection process in the Hospital's premises. In a case where certain misconduct and unethical procedures are reported according to the health institution premises. Therefore, I declare my voluntary consent on behalf of the _____ Hospital management to allow this study to be conducted in the Hospital with my own name and signature below.

Name and signature of head of the Hospital: _____

Name and signature of Data collector: _____

Thank you for your cooperation!

9.2 Participant Information Sheet and Informed Voluntary Consent Form for Pregnant Women

Hello, my name is _____. I am working as data collector for the study being conducted by **Teklehaimanot Gereziher** who is studying his Master's degree at Haramaya University, College of Health and medical Sciences. I kindly request you to lend me your attention to explain you about the study and being selected as the study participant.

Title of the study: Determinants of preeclampsia among women attending delivery services in public hospitals in central zone, Tigray, Northern Ethiopia.

Purpose of the study: The findings of this study can be of a paramount importance in your Hospital to identify determinants for preeclampsia to find the way for decreasing both preeclampsia occurrence and risk of its death that contributes for maternal and infant mortality and morbidity significantly. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of a master's program in Maternity and Neonatal Nursing for the principal investigator.

Procedure and duration: I will be interviewing you using questionnaire to provide me with pertinent data that is helpful for the study. There are 36 questions to answer where I will fill the questionnaire by interviewing you. The question that is going to be asked usually takes about 20 minutes, so I kindly request you to spare me this time for the interview.

Risk and benefits: The risk of being participated in this study is very minimal, but only taking few minutes from your time. There is no direct benefit to you now. However, the result of the study, will be helpful for all population in the future by identifying the determinants that contribute to preeclampsia which is useful in delivering improved health care services.

Confidentiality: The information you will provide us will be confidential. There will be no information that will identify you in particular. The findings of the study will be general for the study area and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link you to the study.

Rights of Participants: Participation for this study is fully voluntary. 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.

Contact address: If there are any questions or enquires any time about the study or the procedures, please contact:

Teklehaimanot Gereziher: Mobile number (+251)-930928823.

Email Address: teklehaimg@gmail.com

Institutional Health Research Ethics Review Committee (IHRERC) Haramaya University:

Office phone: (+251)-0254662011 or P.O. Box: 235, Harar

Declaration of informed voluntary consent:

I have read/ was read to me the information sheet, I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any questions. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that I have the right to withdraw from the study at any time or not to answer any question that I do not want. Therefore; I declare my voluntary consent to participate in this study with my initials below.

Name and signature of participant: _____ Date: _____

Name and signature of Data Collector: _____ Date: _____

Thank you very much for your participation

9.3 Participants Information Sheet and Informed Voluntary Consent Form for Guardians of Pregnant Women Age Less than 18 Years

Hello, my name is _____. I am working as data collector for the study being conducted by **Teklehaimanot Gereziher** who is studying his Master's degree at Haramaya University, College of Health and medical Sciences. I kindly request you to lend me your attention to explain you about the study and being selected your wife/ daughter as the study participant.

Title of the study: Determinants of preeclampsia among women attending delivery services in public hospitals in central zone, Tigray, Northern Ethiopia.

Purpose of the study: The findings of this study can be of a paramount importance in your Hospital to identify determinants for preeclampsia to find the way for decreasing both preeclampsia occurrence and risk of its death that contributes for maternal and infant mortality and morbidity significantly. Moreover, the aim of this study is to write a thesis as a partial requirement for the fulfillment of a master's program in Maternity and Neonatal Nursing for the principal investigator.

Procedure and duration: I will interview your wife/ daughter using questionnaire to provide me with pertinent data that is helpful for the study. There are 36 questions to answer where I will fill the questionnaire by interviewing your wife/ daughter. The question that is going to be asked usually takes about 20 minutes, so I kindly request your wife/ daughter to spare me this time for the interview.

Risk and benefits: The risk of being participated in this study is very minimal, but only taking few minutes from your wife/ daughter time. There is no direct benefit to your wife/ daughter now. However, the result of the study, will be helpful for all population in the future by identifying the determinants that contribute to preeclampsia which is useful in delivering improved health care services.

Confidentiality: The information your wife/ daughter will provide us will be confidential. There will be no information that will identify your wife/ daughter in particular. The findings of the study will be general for the study area and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude showing names. No reference will be made in oral or written reports that could link her to the study.

Rights of Participants: Participation for this study is fully voluntary. your wife/ daughter has the right to declare to participate or not in this study. If your wife/ daughter decides to participate, she has the right to withdraw from the study at any time and this will not label her for any loss of benefits which she otherwise is entitled. She does not have to answer any question that she does not want to answer.

Contact address: If there are any questions or enquires any time about the study or the procedures, please contact:

Teklehaimanot Gereziher: Mobile number (+251)-930928823.

Email Address: teklehaimg@gmail.com

Institutional Health Research Ethics Review Committee (IHRERC) Haramaya University:

Office phone: (+251)-0254662011 or P.O. Box: 235, Harar

Declaration of informed voluntary consent:

I have read/ was read to me the information sheet on behalf of my wife/ daughter, I have clearly understood the purpose of the research, the procedures, the risks and benefits, issues of confidentiality, the rights of participating and the contact address for any questions. I have been given the opportunity to ask questions for things that may have been unclear. I was informed that she has the right to withdraw from the study at any time or not to answer any question that she does not want. Therefore; I declare my voluntary consent on behalf of my wife/ daughter to allow this study to be conducted with my signature as indicated below.

Name and Signature of Guardians: _____ Date: _____

Name and signature of Data Collector: _____ Date: _____

Thank you very much for your participation

9.4 English Version of the Questionnaires

ID _____

I. Sociodemographic factors			
Serial number	Question	Response	Skip
101	Age	_____ (in year)	
102	What is your ethnicity?	1. Tigray 2. Oromo 3. Amhara 4. Others (specify) _____	
103	What is your religion?	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others(specify) _____	
104	Residence	1. Urban 2. Rural	
105	What is your occupation?	1. House wife 2. Merchant 3. Government employee 4. Private employee 5. Students 6. Others (specify) _____	
106	What is your marital status?	1. Never married 2. Married or living together 3. Divorced 4. Separated 5. Widowed	
107	What is your educational status?	1. No formal education 2. Primary 3. Secondary 4. Technical/vocational 5. Higher education	
II. Medical illness factors			
201	Preeclampsia status of participants? (from documentation data)	1. Yes 2. No	
202	Had any body from your family had or have hypertension? (check all that apply for first degree relatives only)	1. Yes 2. No..... 3. I don't know	204
203	If yes, who?	1. Father 2. Mother 3. Brother 4. Sister	

204	Had any body from your family had or have Diabetes mellitus? (check all that apply for first degree relatives only)	1. Yes 2. No 3. I don't know	206
205	If yes, who?	1. Father 2. Mother 3. Brother 4. Sister	
206	Had any body from your family had or have preeclampsia? (check all that apply for first degree relatives only)	1. Yes 2. No 3. I don't know	208
207	If yes, who?	1. Mother 2. Sister	
208	Have you been told by a physician that you had or have Diabetes mellitus?	1. Yes 2. No	
209	Anemia status of the participants during this pregnancy? (from documentation data)	1. Yes 2. No	
210	Have you ever been told by a physician that you had or have preeclampsia prior this pregnancy?	1. Yes 2. No	
III. Personal reproductive related factors			
301	Have you been pregnant before this pregnancy? (Include all pregnancies that ended in life births, spontaneous or induced abortions, ectopic pregnancy and stillbirth as well)	1. Yes 2. No	307
302	How many have you been pregnant?	_____Times	
303	What was the time interval between previous and this pregnancy?	____year____ month	
304	Have you ever had history of abortion	1. Yes 2. No	306
305	How many abortions do you had	_____Times	
306	How many times have you given birth during your life?	_____Times	
307	Have you planned for this pregnancy?	1. Yes 2. No	
308	What is the multiplicity of mother's pregnancy?	1. Singleton 2. Twin	
309	What is the sex of newborn for this pregnancy?	1. Male 2. Female	
IV. Pregnancy behavior factors			
401	Were you drinking alcohol during this pregnancy?	1. Yes 2. No	403
402	If yes, which type?	1. Beer 2. Tala 3. Katikala	

		4. Tej 5. Wine 6. Others specify _____	
403	Have you attended ANC clinic for this pregnancy?	1. Yes 2. No	405
404	If yes, number of ANC clinic visittimes	
405	Were you using modern contraceptive before this pregnancy?	1. Yes 3. No	407
406	If yes, what type?	1. Pill 2. Injectable 3. Implant 4. Intrauterine contraceptive device 5. Others specify _____	
407	Were you eating fruit during this pregnancy?	1. Yes 2. No.....	409
408	If yes, how often?	1. Daily 2. _____ days per week	
409	Were you eating vegetables during this pregnancy?	1. Yes 2. No	
410	If yes, how often?	1. Daily 2. _____ days per week	

Thank you for your cooperation!!!

9.5 ብድሌት ዝተመሰረተ ንጥነት ኣዴታት ዝወሃብ ሙብሪሂ ቃለ መሕተት ስምምዕነት ቅጥዒ

ጥዕና ይሃበላይ፡ ሸመይ _____ ዝበሃል ኮይን ዝመጸአኩሉ ድማ ኣይተ ተኸለሃይማኖት ገረዚሄር ዝተብሃለ ኣብ ሃራማያ ዩኒቨርስቲ ክፍሊ ትምህርቲ ነርስ ን ካልኣይ ዲግሪ ናይ መመሪቕ ጽሑፍ ዝገብርን ዝቆጸጸርን ኮይኑ ጽንዓቱ ድማ ኣብ እዋን ጥንሲ ንዘጋጥም ደም በዝሒ መበገሲኦም ዝምልከት ሓቤረታ ንምእካብ እዩ። ነዚ መጽናዕቲ እዚ ድማ ብሃራማያ ዩኒቨርስቲ ሙሉእ ድጋፍን ፍቓድን ተዋሂቡዎ እዩ። እቲ ጽንዓት ኣብ ዉሽጢ ናይ መንግስቲ ሆስፒታላት ክወልዳ ዝመጽኦ ኣዴታት ዝግበር ይኸውን። ስለዚ ብኸመይ ከምዝተሳተፉ ዝርዝር መረዳኢታ ናይቲ መፅንዓቲ ንክበረሃለን ዝተወሰነ ደቓይቕ ክትተሓባበሩኒ ብትሕትና ይሓትት።

ናይቲ መፅንዓቲ ርእሲ፡ ኣብ ማእኸላይ ዞባ ኣብ ዝርከቡ ናይ መንግስቲ ሆስፒታላት ክወልዳ ንዝመጽኦ ኣዴታት ኣብ እዋን ጥንሲ ንዘጋጥም ደም በዝሒ መበገሲኦም ዝምልከት ሓቤረታ ዝድህስስ ፅንዓት ይኸውን።

ናይቲ መጽናዕቲ ዕላማ፡ ወፅኢት እዚ ፅንዓት ንሆስፒታልክን ብዛዕባ ጥነት ኣዴታት ኣብ እዋን ጥንሲ ንዘጋጥም ደም በዝሒ ንምምሕያሽን ልምዲ ንምወሳድን ኣብ ዝግበር ፃዕሪ ልዑል ጠመተ ይህልዎ። ካብዚ ብተወሳኺ ዋና ዕላምኡ ናይ ዘፅንዕ ኣካል ብኣዴታትን ናፅላ ህጻናትን ናይ ማስተርስ ድግሪ መመሪቕ ፅሑፍ ንምድላዉ ይጠቅም ።

እዋንን ከይዲ ፅንዓትን፡ ንፅንዓቱ ዘገልግሉን ሙብሪሂ ከህቡ ይኸእሉ እዮም ዝበልኩዎም ሕቶታት ክሓተክን እዩ። ብሓፈሻ ከባቢ 36 ሕቶታት ዝተዳለዉ እንትኹኑ ንምምላስ ዝወስደለን ግዘ ድማ 20 ደቂቓ ይኸውን። ስለዚ ሓዚ እዉን ደግመ ንኺተሓባበሩኒ ብትሕትና ይሓትት።

ጥቕምን ጉድኣትን፡ ኣብዚ ፅንዓት ብምስታፈን ዝመጽእ ጉድኣት ብጣዕሚ ንእሽተይ እዩ ፣ እዙይ ካዓ ካብ ዝነበረን ግዘ ስለ ንካፈለን እዩ። ብተወሳኺ ኣብዚ ፅንዓት ብምስታፍክን ብቐጥታ ዝረኽብኦ ጥቕሚ የለን። ኮይኑ ግና ብተዘዋወሪ ካብ ፅንዓቱ ዝርከብ ብዛዕባ ናይ ኣዴታት ጥዕና ከም እዉን ኣብ እዋን ጥንሲ ንዘጋጥም ደም በዝሒ መበገሲታት ብዝምልከት ጠቐምቲ ሓሳባት ትልሚ ንምወፃእ ይጠቅም ።

ምሽጥር ምሕላዉ፡ ንዝህብኦ ሓሳብ ኹሉ ምሽጥሩ ዝተሓለወ እዩ፤ ስለዚ ንዓኸን ዝገልፅ ምንም ዓይነት ሓበሬታ ኣይክህሊውን። ናይ ፅንዓቱ ወፅኢት ናይ ዉልቀ-ሰብ ወይ ከዓ ናይ ቤተ-ሰብ ዘይኮነስ ንኩሉ ሕብረተ-ሰብ እዩ። ሹም ንዘይ ምቁላፅ እቲ ቃለ መሕተት ናይ ምሽጥር ቁጽሪ ይግበረሉ እዩ።

ናይ ተሳተፍቲ መሰላት፡ ኣብዚ ፅንዓት እዚ ንምስታፍ ፍቓደኛ ምዃን የድሊ። ከምኡ እዉን ናይ ምስታፍን ዘይምስታፍን መሰለን ዝተሓለወ እዩ። ኣብ እዋን ቃለ መሕተት እንተዘይተስማዕምዕውን ብዘይ ስኽፍታ ናይ ምቁራፅ መሰለን ዝተሓለወ እዩ። መልስ ንምሃብ ዘይደልይኦ ሕቶ ኣንተሃልዩ ናይ ዘይምምላስ መሰለን ሕልዉ እዩ።

መራኽቦ ኣድራሻ፡ ኣብ ዝኾነ ሰዓት ስለፅንዓቱ ይኹን ምስፅንዓቱ ዝተተሓዙ ሓሳባት ከምኡ እዉን ክበርሃለን ዝደልዩኦ ሕቶታት እንተሃልይዉን በዘም ዝስዕቡ ኣድራሻ ተጠቂመን ኣብ ዝደለዩኦ እዋን ምሕታት ይኸእላ እዩን።

ናይዚ ጽንዓት መካየዲ ሸም፡ ተኸለሃይማኖት ገረዚሄር

ስልኪ፡ (+251)-930928823

ኢ-ሜይል፡ teklehaim@gmail.com

ሃራማያ ዩኒቨርስቲ፡ ናይ ጥዕና ትካሉ ስነ-ምግባርን ምርምርን ገምጋሚን ኮምቴ፡

ናይ ስራሕ ስልኪ፡ (+251)-0254662011 or P.O. Box: 235, ሃረር

ፍቅደኛ ምክን ዝገልፅ ናይ ስምምዕነት መረዳኢታ ፡ ናይ ተሳተፍቲ መረዳኢታ ብዝግባእ ኣንብቦ/ተነብብላይ እዩ።ናይ ፅንዓቱ ዕላማ፣ዘለዎ ጥቕምን ጉዳኣትን፣ኣተሓሕዛ ምሽጥር፣ናይ ምስታፍን ዘይምስታፍን መሰል፣ፀገም እንተሃልዩ ንመን ከምዝሓትት፣ሕቶ እንተሀልይኒ ከም ዝሓትት ዕድል ተዋህብኒ፣ከምኡ እዉን ቻለ-መሕትቱ ኣብ ዝኾነ እዋን ምግዳፍ ተደልዩ ምግዳፍ ከም ዝኸእል ኣብ መወዳእታ ምምላስ ዘይደልዮም ሕቶታት ናይ ዘይምምላስ መሰል ከምዘለኒ ብግቡእ ምስተረዳእኹ ብፍቅደይ ኣብዚ ፅንዓት ንምስታፍ ዝወሰንኹ ምዃነይ ኣብ ታሕቲ ብፌርማይ የረጋግፅ።

ስለዚ ኣብዚ መጽናዕቲ ንምስታፍ ፍቃደኛ ዲየን?

ሀ፣ ኣይፋል ለ፣ እሺ (ናብ ታሕታይ ቀጽል)

ናይ ተሳታፊት ሹምን ፊርማን _____

ናይ ሓበሬታ ዝእኩብ ሹምን ፊርማን _____

ዝተጠየቀትሉ ዕለት በኢትዮጵያ ኣቆጻጽራ -----/-----/-----

9.6 ትሕቲ 18 ዕድመ ዝኾና ጥኑሳት ኣዴታት ብድሌት ዝተመሰረተ ዝወሃብ መብሪሂ ቃለ መሕተት ስምምዕነት ቅጥዒ

ጥዕና ይሃበለይ፡ ሸመይ _____ ዝበሃል ኮይነ ዝመጸአኩሉ ድማ ኣይተ ተኸለሃይማኖት ገረዚሄር ዝተብሃለ ኣብ ሃራማያ ዩኒቨርሲቲ ክፍሊ ትምህርቲ ነርስ ን ካልኣይ ዲግሪ ናይ መመሪቕ ጽሑፍ ዝገብርን ዝቆጸጸርን ኮይኑ ጽንዓቱ ድማ ኣብ እዋን ጥንሲ ንዘጋጥም ደም በዝሒ መበገሲኣም ዝምልከት ሓቤረታ ንምእካብ እዩ። ነዚ መጽናዕቲ እዚ ድማ ብሃራማያ ዩኒቨርሲቲ ሙሉእ ድጋፍን ፍቓድን ተሞህቡዎ እዩ። እቲ ጽንዓት ኣብ ዉሽጢ ናይ መንግስቲ ሆስፒታላት ክወልዳ ዝመጽእ ኣዴታት ዝግበር ይኸውን። ስለዚ በኸመይ በዓልቲዝዛኻ/ጋለን ከምዝተሳተፉ ዝርዝር መረዳኢታ ናይቲ መፅንዖቲ ንክበረሃልካ/ክን ዝተወሰኑ ደቓይቕ ክትተሓባበረኒ/ራኒ ብትሕትና ይሓትት።

ናይቲ መፅንዖቲ ርእሲ: ኣብ ማእኸላይ ዞባ ኣብ ዝርከቡ ናይ መንግስቲ ሆስፒታላት ክወልዳ ንዝመጽእ ኣዴታት ኣብ እዋን ጥንሲ ንዘጋጥም ደም በዝሒ መበገሲኣም ዝምልከት ሓቤረታ ዝድህስስ ፅንዖት ይኸውን።

ናይቲ መጽናዕቲ ዕላማ: ዉፅኢት እዚ ፅንዖት ንሆስፒታልክን ብዛዕባ ጥኑሳት ኣዴታት ኣብ እዋን ጥንሲ ንዘጋጥም ደም በዝሒ ንምምሕያሽን ልምዲ ንምወሳድን ኣብ ዝግበር ፃዕሪ ልዑል ጠመተ ይህልዎ። ካብዚ ብተወሳኺ ዋና ዕላምኡ ናይ ዘፅንዕ ኣካል ብኣዴታትን ናፅላ ህጻናትን ናይ ማስተርስ ድግሪ መመሪቕ ፅሑፍ ንምድላዉ ይጠቅም ።

እዋንን ከይዲ ፅንዖትን: ንፅንዖቱ ዘገልግሉን መብርሂ ከህቡ ይኸእሉ እዮም ዝበልኩዎም ሕቶታት ንበዓልቲዝዛኻ/ጋለን ክሓታ እዮ። ብኣፈሻ ከባቢ 36 ሕቶታት ዝተዳለዉ እንትኹኑ ንምምላስ ዝወስደላ ግዜ ድማ 20 ደቕቓ ይኸውን። ስለዚ ሓዚ እዉን ደግመ በዓልቲዝዛኻ/ጋለን ንኺትተሓባበረኒ ብትሕትና ይሓትት።

ጥቕምን ጉድኣትን: ኣብዚ ፅንዖት በዓልቲዝዛኻ/ጋለን ብምስታፋ ዝመጽእ ጉድኣት ብጣዕሚ ንእሽተይ እዩ ፣ እዙይ ካዓ ካብ ዝነበራ ግዜ ስለ ዝካፈላ እዩ። ብተወሳኺ ኣብዚ ፅንዖት በዓልቲዝዛኻ/ጋለን ብምስታፋ ብቐጥታ ትረኽቦ ጥቕሚ የለን። ኮይኑ ግና ብተዘዋወሪ ካብ ፅንዖቱ ዝርከብ ብዛዕባ ናይ ኣዴታት ጥዕና ከምኡ እዉን ኣብ እዋን ጥንሲ ንዘጋጥም ደም በዝሒ መበገስታት ብዝምልከት ጠቕምቲ ሓሳባት ትልሚ ንምወፃእ ይጠቅም ።

ምሽጥር ምሕላዉ: በዓልቲዝዛኻ/ጋለን ንትህቦ ሓሳብ ኹሉ ምሽጥሩ ዝተሓለወ እዩ፤ ስለዚ ንበዓልቲዝዛኻ/ጋለን ዝገልፅ ምንም ዓይነት ሓበሬታ ኣይክህሊውን። ናይ ፅንዖቱ ዉፅኢት ናይ ዉልቀ-ሰብ ወይ ከዓ ናይ ቤተ-ሰብ ዘይኮነስ ንኩሉ ሕብረተ-ሰብ እዩ። ሹም ንዘይ ምቁላዕ እቲ ቃለ መሕተት ናይ ምሽጥር ቁጽሪ ይግበረሉ እዩ።

ናይ ተሳተፍቲ መሰላት: ኣብዚ ፅንዖት እዚ ንምስታፍ ፍቓድኛ ምዃን የድሊ። ከምኡ እዉን ናይ ምስታፍን ዘይምስታፍን መሰል በዓልቲዝዛኻ/ጋለን ዝተሓለወ እዩ። ኣብ እዋን ቃለ መሕተት እንተዘይተስማዕምዎ ብዘይ ስኽፍታ ናይ ምቁራፅ መሰላ ዝተሓለወ እዩ። መልስ ንምሃብ ዘይትደልዮ ሕቶ ኣንተሃልዩ ናይ ዘይምምላስ መሰላ ሕልዉ እዩ።

መራኽቦ ኣድራሻ: ኣብ ዝኾነ ሰዓት ስለፅንዖቱ ይኹን ምስፅንዖቱ ዝተተሓዙ ሓሳባት ከምኡ እዉን ክበርሃልኩም ትደልዎ ሕቶታት እንተሃልዩ በዞም ዝስዕቡ ኣድራሻ ምሕታት ይክኣል እዩ።

ናይዚ ጽንዖት መካየዲ ሸም: ተኸለሃይማኖት ገረዚሄር

ስልኪ: (+251)-930928823

ኢ-ሜይል: teklehaimg@gmail.com

ሃራማያ ዩኒቨርሲቲ: ናይ ጥዕና ትካሉ ስነ-ምግባርን ምርምርን ገምጋሚን ኮምቴ:

ናይ ስራሕ ስልኪ: (+251)-0254662011 or P.O. Box: 235, ሃረር

ፍቅደኛ ምኝን ዝገልፅ ናይ ስምምዕነት መረዳኢታ ፡ ብሹም በዓልተገዛይ/ጋለይ ናይ ተሳተፍቲ መረዳኢታ ብዝግባእ ኣንብቦ/ተነብብላይ እዩ።ናይ ፅንዓቱ ዕላማ፣ዘለዎ ጥቕምን ጉዳኣትን፣አተሓሕዛ ምሽጥር፣ናይ ምስታፍን ዘይምስታፍን መሰል፣ፀገም እንተሃልዩ ንመን ከምዝሓትት፣ሕቶ እንተሀልይኒ ከም ዝሓትት ዕድል ተዋህብኒ፣ከምኡ እዉን ቆለ-መሕትቱ ኣብ ዝኾነ እዋን ምግዳፍ ተደልዖ ምግዳፍ ከም ትኸእል ኣብ መወዳኢታ ምምላስ ዘይትደልዮም ሕቶታት ናይ ዘይምምላስ መሰል ከምዘለዎ ብግቡእ ምስተረዳእኹ ብሹም በዓልተገዛይ/ጋለይ ብፍቅደይ እዚ ፅናዓት ንክካየድ ዝወሰንኹ ምዃነይ ኣብ ታሕቲ ብፌርማይ የረጋግፅ።

ናይ በዓልገዝኣ/ቤተሰባ ሹምን ፊርማን _____

ናይ ሓበሬታ ዝእኩብ ሹምን ፊርማን _____

ዝተጠየቀትሉ ዕለት በኢትዮጵያ አቆጻጸራ -----/-----/-----

9.7 Tigrigna Version of the Questionnaires

መፍለይ ቁጽሪ _____

ክፍሊ 1፡ ሕቶታት ብዛዕባ ማሕበራዊ ኩነታት			
ተ.ቁ	ሕቶታት	መማረጺ መልሶታት	ዝለል
101	ዕድመ	_____ ዓመት	
102	ብሄራን ኣባይ እዩ?	1. ትግረወይቲ 2. ኦሮሞቴቲ 3. ኣምሓረቲ 4. ካለእ እንተኮይኑ ይጠቀስ_____	
103	ሃይማኖትን እንታይ እዩ?	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ካለእ እንተኮይኑ ይጠቀስ_____	
104	መንበሪ ቦታ ኣባይ እዩ?	1. ከተማ 2. ገጠር	
105	ኩነታት ስርሐን እንታይ እዩ?	1. እመቤት 2. ነጋዴ 3. ሰራሕተኛ መንግስቲ 4. ኣብ ናይ ውልቀ ተቆጺራ ትሰሪሕ 5. ተመሃሪት 6. ካለእ እንተኮይኑ ይጠቀስ----	
106	ናይ ሓዳር ኩነታት?	1. ዘይተመርዐዎት 2. ዝተመርዐዎት/ኣቢርና እና ንነብር 3. ዝተፋተሐት 4. ተፈላሊዮም ዝነብሩ 5. በዓል ገዛይ ብሂወት የለን	
107	ናይ ትምህርተን ኩነታት ከመይ እዩ?	1. ኣይተማህርኩን 2. ቀዳማይ ብርኪ 3. ካልኣይ ብርኪ 4. ናይ ሞያ ትምህርቲ 5. ላዕለዎይ ትምህርቲ	
ክፍሊ ክልተ፤ ምስ ናይ ጥዕና ሽግር ዝተተሓዘ ሕቶታት			
201	ኣብዚ ሕጂ ጥንሰን ኣብ እዋን ጥንሲ ዘጋጥም ደም በዝሒ ኩነታት ከመይ እዩ? (ካብ ዶክመንቲሽን ዝውሰድ)	1. እወ 2. ኣይፋል	
202	ኣብ ቤተሰብኩም ውሽጢ ደም በዝሒ ሕማም ዝነበሮ ወይ ካዓ ዘለዎ ኣሎ ዶ? (ንናይ መጀመርያ ቤተሰብ ዝምልከት)	1. እወ 2. ኣይፋል..... 3. ኣይፈልጥን	204
203	እወ እንተደኣ ሾይኑ መልሰን፡ እዚ ሕማም ዘለዎ መን እዩ?	1. ኣቦ 2. ኣደ 3. ሓፍቲ 4. ሓው	

204	ኣብ ቤተሰብኩም ውሽጢ ናይ ሸኮር ሕማም ዝነበሮ ወይ ካዓ ዘለዎ ኣሎ ዶ? (ንናይ መጀመርያ ቤተሰብ ዝምልከት)	1. እወ 2. ኣይፋል..... 3. ኣይፈልጥን	206
205	እወ እንተድኣ ኾይኑ መልሰን፡ እዚ ሕማም ዘለዎ መን እዩ?	1. ኣቦ 2. ኣደ 3. ሓፍቲ 4. ሓው	
206	ኣብ ቤተሰብኩም ውሽጢ ኣብ እዋን ጥንሲ ዘጋጥም ደም በዝሒ ዝነበረን ወይ ካዓ ዘለዎን ኣለዎ ዶ? (ንናይ መጀመርያ ቤተሰብ ዝምልከት)	1. እወ 2. ኣይፋል..... 3. ኣይፈልጥን	208
207	እወ እንተድኣ ኾይኑ መልሰን፡ እዚ ሕማም ዘለዎ መን እዩ?	1. ኣደ 2. ሓፍቲ	
208	ናይ ሸኮር ሕማም ከም ዘለዎን ብ ዶክተር ተነግርዎን ዶ ነይሩ?	1. እወ 2. ኣይፋል	
209	ኣብዚ ሕጂ ጥንሰን ናይ ደም ዋሕዲ ኩነታት ከመይ እዩ? (ካብ ዶክተር ተነግሩ)	1. እወ 2. ኣይፋል	
210	ኣብ ዝሓለፈ ጥንሰን ኣብ እዋን ጥንሲ ዘጋጥም ደም በዝሒ ከም ዝነበረን ብ ዶክተር ተነግርዎን ዶ ነይሩ?	1. እወ 2. ኣይፋል	
ክፍሊ ሰለስተ፤ ኣብ ጥንሲን ወሊዲን ዝሓመዱ ሕቶታት			
301	ቅድሚ ሕጂ ጠንሰን ዶ ይፈልግ? (ኣብ እዋን ጥንሲ ዝወረደ፤ ሙውት ዝተወለደን ካብ ማህጸን ውጻኢ ዝተጠነሰን የጠቓልል እዩ።)	1. እወ 2. ኣይፋል.....	307
302	እወ እንተድኣ ኾይኑ መልሰን፡ ክንደይ ግዜ ጠንሰን?	_____ ግዜ	
303	ናይ ሕጂ ጥንሰን ካብ ዘሓለፈ ጥንሰን ናይ ክንደይ ዝኣከል ግዜ ኣፈላላይ ኣለዎ?	_____ ዓመት _____ ወርሒ	
304	ጥንሲ ወሪድዎን ዶ ይፈሊጥ?	1. እወ 2. ኣይፋል _____	306
305	እወ እንተድኣ ኾይኑ መልሰን፡ ክንደይ ግዜ ጥንሲ ወሪድዎን ይፈሊጥ?	_____ ግዜ	
306	ክንደይ ግዜ ወሊድኪ?	_____ ግዜ	
307	ናይ ሕጂ ጥንሰን ብእቅድን መሰረት ዲዩን ጠንሰንኡ?	1. እወ 2. ኣይፋል	
308	ናይ ጥንሲ ዓይነት	1. ሓደ 2. መንታ	
309	ናይ ሕዚ ዝተወለደ ህጻን ጾታኡ እንታይ እዩ?	1. ተባዕታይ 2. ተነስተይቲ	
ክፍሊ ኣርባዕተ፤ ምስ ናይ ውልቀ ባህሪያት ዝተሓመዱ ሕቶታት			
401	ኣብዚ ሕዚ ጥንሰን ኣልኮላዊ መስተ ሰትዮን ዶ ነይረን?	1. እወ 2. ኣይፋል.....	403
402	እወ እንተድኣ ኾይኑ መልሰን፡ እንታይ ዓይነት መስተ እዩ?	1. ቢራ 2. ስዋ 3. ኣረቂ/ካቲካላ 4. ጠጂ 5. ዋይን 6. ካሊእ እንተሃልዩ ይጠቀስ _____	

403	ናይ ጥንሲ ከትትል ትገብሪ ዶ ነይርኪ?	1. እወ 2. ኣይፋል.....	405
404	ናይ ጥንሲ ከትትል ትገብሪ እንተነይርኪ ከንደይ ግዜ? ግዜ	
405	ኣብ ዘሓለፈ ጥንሲን ዘመናዊ ጥንሲ መከላከሊ ተጠቅመን ዶ ነይረን?	1. እወ 2. ኣይፋል.....	407
406	እወ እንተድኣ ኾይኑ መልሰን: እንታይ ዓይነት?	1. ከኒና 2. በመርፍእ ዝውሃብ 3. ኣብ ከንዲ ዝቅበር 4. ሉፕ/ብማህፀን ዝኣቱ 5. ካሊእ እንተሃልዩ ይጠቀስ _____	
407	ኣብ እዋን ጥንሲ ፍራፊሬ ይምገባ ዶ ነይረን?	1. እወ 2. ኣይፋል.....	409
408	እወ እንተድኣ ኾይኑ መልሰን: ከንደይ ዝኣክል?	1. በብመዓልቲ 2. ሓል ሓሊፉ፤ ኣብ ሰሙን ን _____ መዓልቲ	
409	ኣብ እዋን ጥንሲ ኣትክልቲ ይምገባ ዶ ነይረን?	1. እወ 2. ኣይፋል.....	
410	እወ እንተድኣ ኾይኑ መልሰን: ከንደይ ዝኣክል?	1. በብመዓልቲ 2. ሓል ሓሊፉ፤ ኣብ ሰሙን ን _____ መዓልቲ	

የቕንዩሊይ ብጣዕሚ እዩ ዘመስግን!!!

9.8 Curriculum Vitae of the Investigator

1. Personal Information

Full Name: Teklehaimanot Gereziher Haile

Date of Birth: June 14, 1983 E.C

Place of Birth: Humera, Tigray

Age: 29

Sex: Male

Marital Status: Single

Nationality: Ethiopian

Personal address: Aksum, Tigray

mobile: +251930928823/914106211

Email: teklehaimg@gmail.com

2. Education Background

Primary School: - 1992-1997 E.C Lemeat Elementary school (Grade 1-8)

Secondary School: - 1998-1999 E.C Humera Senior Secondary School (Grade 9-10)

Preparatory School: - 2000-2001 E.C Humera preparatory school (Grade 11-12)

University: - 2002-2005 E.C BSc in Nursing at Mekelle University


3. Language Skill

Language	Speaking	Reading	Listening	writing
Tigrigna	Excellent	Excellent	Excellent	Excellent
Amharic	Excellent	Excellent	Excellent	Excellent
English	Excellent	Excellent	Excellent	Excellent

4. Professional Qualification

I have Bachelor of Science degree / BSc. Degree/ in Comprehensive Nursing from Mekelle University with CGPA of 3.82

5. Awards

 I have academic excellence certificate given by Mekelle University for scoring above 3.50

 Certificate of professional registration and licensing from Tigray health Bureau

6. Additional skills

- ✚ Basic computer skill
- ✚ COC Competence

7. Extra training

- ✚ Certificate on Pedagogy
- ✚ Onsite training on effective teaching skill and SBM-R

8. Work Experience

- ✚ From October 22/02/06 - 13/05/07 E.C work in Bushana health center, Southern Ethiopia.
- ✚ From January 18/05/07 – 09/01/09 E.C work as instructor at Araya Kahu health science college department of Nursing.
- ✚ From 10/01/09 E.C- till now I am working as assistant lecturer at Aksum University College of Health Science, department of Nursing.

9. Personal quality: I have

- ✚ Good communication ability with staffs and society
- ✚ Willingness and ability to work any type of work at any time.
- ✚ Active learner

10. Hobbies and Interest

- ✚ Reading different books
- ✚ Searching internet for new innovation
- ✚ Visiting historical places

11. Memberships of professional bodies

- ✚ Nursing association club, Since 2010 G.C

12. References

- ✚ Mr. Teklewoini Mariye: Lecturer of Aksum University, Mobile: +251966744324
E-mail: teklewoini1@gmail.com
- ✚ Mr. Hagos Berihu: Lecturer and head of school of nursing college health sciences Aksum University, Mobile: +251914198058
E-mail: ahagosberihu@gmail.com
- ✚ Mr. Girmay Teklay: Lecturer of Aksum University, Mobile: +251966744325
E-mail: girmeat@gmail.com