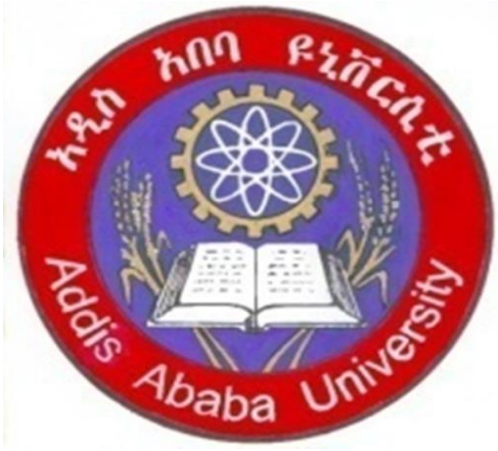

COLLEGE OF HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH

ASSOCIATION BETWEEN PAST HORMONAL CONTRACEPTIVE USE AND PREECLAMPSIA AMONG PREGNANT WOMEN IN GOJJAM ZONES, AMHARA REGION, ETHIOPIA, 2017: CASE CONTROL STUDY

INVESTIGATOR: ABIYOT WOLIE ASRES (BSc)

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE AND SCHOOL OF PUBLIC HEALTH FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR DEGREE OF MASTERS OF PUBLIC HEALTH IN EPIDEMIOLOGY.

OCTOBER, 2017

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PRINCIPAL INVESTIGATOR (PI): ABIYOT WOLIE ASRES (BSc)

ADVISORS : Dr. ADAMU ADDISSIE (MD, PhD, Assoc. Prof)

Ms. ABIGIYA WONDIMAGEGNEHU (BSc, MPH)

Dr. SISAY TEKILU (MD, Assoc. Prof)

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I hereby declare that this thesis is my original work. People and organizations who/that gave their support to me while doing this thesis have been duly acknowledged.

Principal investigator: **ABIYOT WOLIE ASRES** (BSc**)**

Date: _____/_____/___signature _____

Advisors Approval Sheet

This is to certify the thesis entitled "Association of past hormonal contraceptive use and preeclampsia among pregnant women in public hospitals of Gojjam Zones, Amhara Region" is submitted in partial fulfillment of the requirements for the Degree of MPH with specialization in "Epidemiology and Biostatistics" to the Graduate Program of the School of Public Health at Addis Ababa University and has been carried out by **Abiyot Wolie Asres** under our supervision. The student fulfilled the thesis requirements and hence hereby can submit the thesis to the school.

Name of the Advisors: **Dr. ADAMU ADDISSIE** (MD, Assoc. prof.)

Date: _____/_____/_____signature _____

ABIGIYA WONDIMAGEGNEHU (BSc, MPH)

Date: _____/_____/____signature _____

Examiners' Approval Sheet

We, undersigned, member of the Board of Examiners of the final open defense by **Abiyot Wolie Asres** have read and evaluate his thesis entitled "Association of past hormonal contraceptive use and preeclampsia among pregnant women in public hospitals of Gojjam Zones, Amhara Region, 2017". This is to certify that the thesis has been accepted in partial fulfillment of the requirements for the MPH Degree specialization in "Epidemiology and Biostatistics".

Name of internal examiner: **Dr NAUD FIRDU (MD, Assist. Prof)**

Date: _____/_____/_____ signature_____

Name of external examiner: **Dr. GIZACHEW BALEW (PhD)**

Date: _____/_____/_____ signature_____

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LIST OF ACRONYMS / ABBREVIATIONS

AA:	Addis Ababa
AC:	Academic Committee
ANC:	Antenatal Care
AOR:	Adjusted Odds Ratio
BMI:	Body Mass Index
BP:	Blood Pressure
COC:	Combined Oral Contraceptives
DBP:	Diastolic Blood Pressure
DM:	Diabetes Maltus
Depo:	Depo-Provera
EDD:	Expected Date of Delivery
ETB:	Ethiopian Birr
EDHS:	Ethiopian Demographic and Health Survey
EMDHS:	Ethiopian Mini Demographic Survey
FP:	Family Planning
GA:	Gestational Age
HSTP:	Heath Sector Transformation Plan
HTN:	Hypertension
IBI:	Inter Birth Interval
IUCD:	Intrauterine Contraceptive Device
LMP:	Last Menstrual Period
OC:	Oral Contraceptive
OpenEpi:	Open Source Epidemiologic Statistics for Public Health
OR:	Odds Ratio
PIH:	Pregnancy Induced Hypertension
IBI:	Inter Birth Interval
SBP:	Systolic Blood Pressure
SDG:	Sustainable Development Goal
SPH:	School of Public Health
SPSS:	Statistical Package for Social Science
WHO:	World Health Organization
USA:	United States of America

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ABSTRACT

Background: Preeclampsia is a common problem of pregnancy often leading to significant maternal and fetal complications. In Ethiopia the major direct obstetric complications account for 85 percent of maternal deaths. Pregnancy induced hypertensive disorders are one of the common direct causes of maternal deaths in Ethiopia. Those women with a history of preeclampsia have a higher risk of developing preeclampsia in subsequent pregnancies but the effect of commonly used hormonal contraceptives on blood pressure is still not clear. There is no sound study conducted in Ethiopia concerning the specific risk factors, specifically contraceptive use and their effect on preeclampsia.

Objective: To assess the association between past hormonal contraceptive use and preeclampsia among pregnant women who came for ANC or admitted in gynecology and obstetrics ward for delivery in the selected hospitals in Amhara Region, Ethiopia from August 2016 to October 2017.

Methods: Institution based unmatched case control study design was conducted in Finote Selam, Bure, Debre Markos and Motta hospitals. These hospitals were selected due to their high patient flow among other hospitals in Gojjame Zones. Women who were diagnosed as having preeclampsia considered as cases and women without preeclampsia were controls. Cases and controls were selected consecutively in the ANC clinics, obstetrics and gynecology wards in the selected hospitals. The case to control ratio was 1:2. The total sample size was 330 (110 cases and 220 controls). The data was obtained through reviewing women's record, taking some measurements and face to face interview using pretested questionnaire. The data was entered into EPI info and transferred into STATA version 14. Descriptive analysis like frequency, mean and standard deviation were calculated and finally the data was analyzed by logistic regression model using STATA version 14.

Result: There was non-significant association between history of past hormonal contraceptive use and preeclampsia except implant. Independent risk factors of preeclampsia were family history of hypertension (COR= 3.04, 95% CI [1.13-8.23]), history of abortion (AOR= 3.17, 95 CI: [1.31-7.70]), change of paternity (AOR= 3.16, 95%CI: [1.47-6.83]) and multiple pregnancies (AOR= 2.68, 95%CI: [1.10-6.58]. On the other hand, using of implant (AOR=0.41, 95%CI: [0.18-0.93]) and fruit during this pregnancy (AOR = 0.36, 95% CI [0.18-0.72]) were found to be preventive factors for preeclampsia.

Conclusion: History of past hormonal contraceptive use was non-significantly associated with preeclampsia except implants. History of abortion, change of paternity and multiple pregnancies were risk factors whereas fruit intake and implant use were preventive factors for preeclampsia.

Recommendation: Researchers better to do further study on this maternal complication by using large sample size. Health workers better to give attention for pregnant women who have history of abortion and multiple pregnancies. It is better to encourage them to use implant as priority choice of contraception before their pregnancy.

1. INTRODUCTION

1.1. Background

Pregnancy induced hypertension; hemorrhage and infection are major direct obstetric causes of maternal morbidity and mortality worldwide. Among these causes pregnancy induced hypertensions are the second leading cause (14.0%) of maternal mortality next to hemorrhage (27.1%) worldwide. These hypertensive disorders include a wide spectrum of diseases including; pregnancy induced hypertension, chronic hypertension, gestational hypertension, preeclampsia, eclamsia, preeclampsia superimposed on hypertension [1]. Approximately 7 % of women experience hypertensive disorders such as chronic hypertension (existing prior to pregnancy), gestational hypertension, or preeclampsia during pregnancy each year in the United States [2].

Preeclampsia is one of the pregnancy complications which occur after 20 weeks of gestation, at deliveries and post natal period. It is defined by hypertension (systolic ≥ 140mmHg or diastolic ≥ 90 mmHg) and proteinuria [3]. Preeclampsia occurs more frequently in primigravida and multigravida [4], extreme of age and long inter-pregnancy [5], preexisting hypertension and diabetes [6] obesity [7] smoking, low socioeconomic level and diet [8].

The overall prevalence of hypertensive disorders in pregnancy in India was 7.8 of which 5.6% were preeclampsia; 1.5% was gestational hypertension, 0.15% was chronic hypertension, and 0.60% was eclamsia [9]. Similarly, the overall prevalence of pregnancy induced hypertension in Ethiopia was 8.5% [10] and the risk factors were early adolescence, illiteracy, and lack of occupation [11], urban residence, null parity, and multiple pregnancies, having pre - existing hypertension, renal disease and cardiac disease [12].

Hormonal contraceptives are the most commonly used method of birth control worldwide [13]. In the United States, approximately 34.5 million women were using contraception in the last decade [14]. Sub-Saharan Africa has the lowest level of contraceptive prevalence, with only 21 per cent of women of reproductive age who are married or in union using some method of contraception. About half of the 48 countries in Sub-Saharan Africa with data available had a contraceptive prevalence level below 20 per cent and they are located mainly in Western Africa and in the Horn of Africa [15].

The overall contraceptive prevalence rate among all women in Ethiopia was 29 % among this 42% were currently married women of whom about 40% used modern contraceptive methods. The most commonly used hormonal contraceptive method in Ethiopia was injectable i.e. Depo-Provera [16].

1.2. Statement of the problem

Pregnancy induced hypertension complicates up to 10% of all pregnancies and associated with increased risk of adverse fetal, neonatal and maternal outcomes, including preterm birth, intrauterine growth restriction, perinatal death, acute renal or hepatic failure, ante partum hemorrhage, postpartum hemorrhage and maternal death [17].

In Africa and Asia, nearly one tenth of all maternal deaths are associated with hypertensive disorders of pregnancy, whereas one quarter of maternal deaths in Latin America have been associated with pregnancy induced hypertension complications [18]. About 10 to 16 % of maternal mortality rates are caused by pregnancy induced hypertension in Sub-Saharan Africa and southern Asia [19]. Hypertension during pregnancy, particularly preeclampsia, is one of the major obstetrical problems in less-developed countries and the causes of most cases remain unknown [20].

It is estimated that between 50,000 to 60,000 maternal deaths are related with preeclampsia per year worldwide [21]. It is the underlying cause of about one-quarter of all medically indicated preterm deliveries in the United States [22]. In Colombia, preeclampsia has an incidence of 7% of all pregnant women and causes a maternal mortality rate of 42 % 100,000 live births, significantly higher than developed countries [23]. In a study of hospitals managed by Health Care America Corporation, preeclampsia was the second leading cause of pregnancy-related intensive care unit admissions after obstetric hemorrhage [24]. However, the impact of the disease is felt more severely in developing countries, where unlike other more prevalent causes of maternal mortality (such as hemorrhage and sepsis), medical interventions may be ineffective due to late presentation of cases [25]. In Ethiopia the major direct obstetric complications (hemorrhage, obstructed labor, hypertension during pregnancy, unsafe abortion, and sepsis) account for 85 percent of the maternal deaths [26].

Several risk factors have been established for hypertensive disorders during pregnancy including maternal contraception prior to pregnancy, maternal age, educational status, previously existing hypertension, diabetes, primigravida, and obesity [27].

Studies of contraceptive use in relation to preeclampsia risk have focused on barrier and non-barrier methods, to address hypotheses of cumulative seminal fluid exposure and reduced risks of preeclampsia, yet little attention has been given to any specific type of contraception [28]. In a cohort study, a two-fold increase in risk for hypertension was detected in current oral contraceptive (OC) users, as compared to nonusers [29].

Since preeclampsia is a multisystem disorder that can progress rapidly, it requires prompt intervention that may include observation in a tertiary care setting and induction of delivery, which is the only known cure for this condition [30]. Little is known about the risk of preeclampsia and it is not clear about the

effect of commonly used hormonal contraceptives on blood pressure. There is inconsistency between studies about contraceptive use and their relationship with pregnancy induced hypertension. Particularly in Ethiopia, there was no study conducted on the association between hormonal contraceptive use and preeclampsia. Therefore, the aim of this study was to assess the effect of past hormonal contraceptive use on preeclampsia among pregnant women.

1.3. Significance of the study

Country estimates of maternal mortality and their causes over time are crucial to inform planning of sexual and reproductive health programs and to guide advocacy efforts and research at the national level, particularly within the context of the Sustainable Development Goals (SDG). The findings will help as a baseline data for other researchers, institutions or policy makers who will be interested to do on sexual and reproductive health programs in governmental and non-governmental institutions. This study will also help health policy makers to consider the best method of contraceptive methods.

Unlike other causes that lead to maternal deaths, maternal death due to hypertensive disorders and hemorrhage showed an increasing trend in Ethiopia. However the majority of deaths due to preeclampsia and eclamsia are avoidable through the provision of timely and effective care to the women presenting with these complications. Scientific evidence based health care to prevent and treat women with these hypertensive disorders is a necessary step towards achieving the SDG. This finding will be used as scientific evidence to provide optimal health interventions to prevent this maternal problem before or during pregnancy.

Since the only definitive treatment method of preeclampsia is termination/delivery of the fetus, the data helps for early detection and prevention of the occurrence of preeclampsia by identifying risk factors. That means if the risk factors are identified we can prevent the occurrence of preeclampsia at early stage of pregnancy or during ANC follow up. This may be by designing interventions towards the risk factors of this problem. This is because hormonal contraceptive is a modifiable factor thus if the association is proven, it can be modified to other appropriate method of contraception.

This data will help health decision makers, program managers and health care providers to focus on the health needs of mothers through early detection , prevention and informing about pregnancy induced hypertensions particularly preeclampsia before pregnancy, during Antenatal care (ANC) and after delivery. This maternal problem is an issue of SDG since it is still in increasing alarmingly. Therefore, this finding will guide the health policy makers and researchers to give more emphasize towards the search of other extra factor for this disorder.

2. LITERATURE REVIEW

2.1. Overview of preeclampsia

Hypertensive disorders are one of the most important complications of pregnancy and in combination with hemorrhage and infection make a lethal triad which causes the majority of pregnancy-related maternal morbidity and mortality [31]. In developing countries, between 10 to 15% of maternal deaths are associated with hypertensive disorders of pregnancy [32].

About 50,000 to 60,000 maternal deaths are estimated to be related with preeclampsia per year worldwide [21]. It is a common complication of pregnancy leading to significant maternal and fetal complications such as abortion, still birth, preterm delivery, intrauterine growth retardation, fetal and maternal deaths. It increases the risk of maternal mortality in both developed (1.8%) and less developed countries (14%) [33].

2.2. Factors associated with preeclampsia

2.2.1. Socio demographic characteristics

Most studies showed that risk of developing preeclampsia increases with age [34-38] particularly a study conducted in Brazil showed that preeclampsia increases exponentially with age [36]. However, other study conducted in Iran showed that maternal age greater than 20 years old was protective factor of preeclampsia [39]. Those currently unmarried pregnant women had 3 times more likely to develop preeclampsia than those currently married pregnant women. Women not living with their husband, married more than once, housewife status, living in rural area and had primary or no education at all were at increasing risk of developing preeclampsia[35]. In contrast, other studies didn't find association on preeclampsia concerning schooling, income and sex of the baby between cases and controls [40].

2.2.2. Medical illness factors

According to different studies conducted about pregnancy induced hypertension, family history of hypertension, family history of diabetes mellitus(DM), family history of preeclampsia, gestational diabetes maltus, previous history of preeclampsia and high body mass index(BMI) were risk factors of preeclampsia[37,41- 43]. Particularly a study conducted in New York showed that obese women had three-fold increased odds of hypertensive disorders during pregnancy while overweight women had 1.60 times odds of experiencing hypertensive disorders during pregnancy. Women who had ever been diagnosed with diabetes had 5.37 times higher odds of experiencing hypertensive disorders during pregnancy as compared to women who did not have diabetes [34]. But other studies showed that the absence of association between family history of hypertension and preeclampsia [40].

A cross sectional study conducted in Dessie Referral Hospital in Ethiopia showed that those women with family history of hypertension had about 7.2 times higher odds of developing preeclampsia

compared with women who did not have. Those women with family history of diabetes mellitus had 2.4 times higher odds of developing preeclampsia as compared to those with no family history [35].

2.2.3. Obstetric factors

Studies conducted concerning about parity showed that pregnant women who were nulliparous were at higher risk of developing preeclampsia [44]. Specifically a study conducted in Uganda revealed that primigravida women were three times higher to develop preeclampsia than who were gravida 2 to 4. In other hand women who were gravida 5 or more were 4 times higher to develop preeclampsia than women who were gravida 2 to 4 [43]. Similarly, a study conducted in Thailand showed that nulliparity and multifetal pregnancy were risk factors of preeclampsia [42]. However, a study conducted in Brazil suggested that no association between parity and multifetal gestation and preeclampsia [36].

A case control study conducted in Armenia showed that the odds of preeclampsia among multiparous women with long inter birth interval (IBI) were 5.26 times higher compared with multiparous women with short IBI [45]. On the other hand, high BMI, history of abortion and ANC non-attendance was significantly associated with the development of preeclampsia [41]. There was no association between blood group O, A, B and Rh factor and preeclampsia [46]. In other hand, there was significant association on AB blood group and preeclampsia [47].

2.2.4. Behavioral factors

According to a study conducted in Brazil and Great Britain there was no association of smoking habit and preeclampsia [22]. However, a study conducted in Latin America showed that cigarette smoking during pregnancy was protective factors against the development of preeclampsia but smokers with preeclampsia have significantly higher rates of low birth weight, small for gestational age, perinatal mortality, and placental abruption compared with nonsmoking preeclampsia [30]. A study conducted in Uganda showed also that alcohol consumption was preventive factor of preeclampsia [43]. Those pregnant women who used traditional treatment were at higher risk of developing preeclampsia or sever preeclampsia [48].

A prospective study of Hispanic women indicated that getting information about physical activity prior to and during early pregnancy does not significantly reduce risk of preeclampsia [49]. A study conducted in Egypt showed that much salty diet intake, no adequate fresh fruits/vegetables and much fat were significant risk factors of preeclampsia whereas vegetable and fruit consumption and foliate intake during pregnancy are independent protective factors of preeclampsia [40, 50]. On the other hand, anemia and coffee intake during pregnancy are risk factors for the development of preeclampsia [50].

2.3. Contraceptive use and preeclampsia

A study conducted in Britain showed that women under 35 years old using oral contraception had significantly higher mean systolic and diastolic blood pressures than those using non-hormonal forms of contraception but women with age ≥ 35 had no significant difference. There was also a significant association of both systolic and diastolic pressures with duration of current oral contraceptive use. Especially those women who had been taking oral contraceptives continuously for over 12 months were at increasing risk of hypertension disorder compared with those who had been taking for a month or less or not use at all [51]. Another study done in Britain also showed that mean diastolic and systolic blood pressure measurements were significantly higher among oral contraceptive users than among non-users [41] which was the opposite of other study [44]. On the other hand recent use of oral contraceptives was associated with a reduced risk for developing gestational hypertension. In contrast, there was a suggestion that recent use was associated with an increased risk of developing preeclampsia, but only among women who had used these agents for ≥8 years [52].

A study conducted in Korea revealed that longer duration of OC use was positively associated with increasing levels of systolic blood pressure and diastolic blood pressure [53]. In other hand preeclampsia was more common in those women who became pregnant shortly after marriage and did not use contraception or the contraceptive method failed. Barrier contraceptive use in primigravida and having history of cohabitation were highly associated with the development of preeclampsia [54]. A study done in Spain suggested that using oral contraceptive pills before pregnancy was significantly more common in the control group which brings longer sperm exposure period and less preeclampsia incidence. In contrast, there was no significant difference on duration barrier contraceptive use and preeclampsia between cases and controls [55].

According to a study conducted in New York women who used barrier and non-barrier methods of contraception at the time of conception had1.09 and 1.22 times higher odds of experiencing hypertensive disorders during pregnancy as compared to non-users respectively [34].

A study done in Australia showed that no association between duration of hormonal contraceptive use and high blood pressure [56]. Similarly, a study conducted in USA showed that the absence of evidence on the association between pregravida oral contraceptive use and the risk of preeclampsia [57]. However, a study done in Indonesia showed that hormonal contraception use was a risk factor for preeclampsia [58]. A study conducted in China showed that oral contraceptive use before pregnancy had higher risk than intrauterine device (IUD) but the effect of Norplant implants was insignificant [59]. A study conducted in United Kingdom showed that Intrauterine device use is associated with a small

reduction risk of preeclampsia, particularity if removed within the year prior to conception but no association between IUD use and preeclampsia among parous women [60].

According to Ethiopian Demography Health Survey (EDHS) 2016 the overall contraceptive prevalence rate among currently married women was 36%. About 35% currently married women were using modern methods. The most commonly used modern method was injectable which was used by 23% of currently married women. Eight percent of currently married women were using implants and 2 percent used contraceptive pills. In Amhara region about 47.3% women used any method and 46.9% women used any modern method. Among the modern methods 46.4 % were hormonal contraceptive methods of which 29.3 % were injectable, 12.1 % were implants, 3% were IUD and 2% were pills [16].

2.4. Conceptual framework

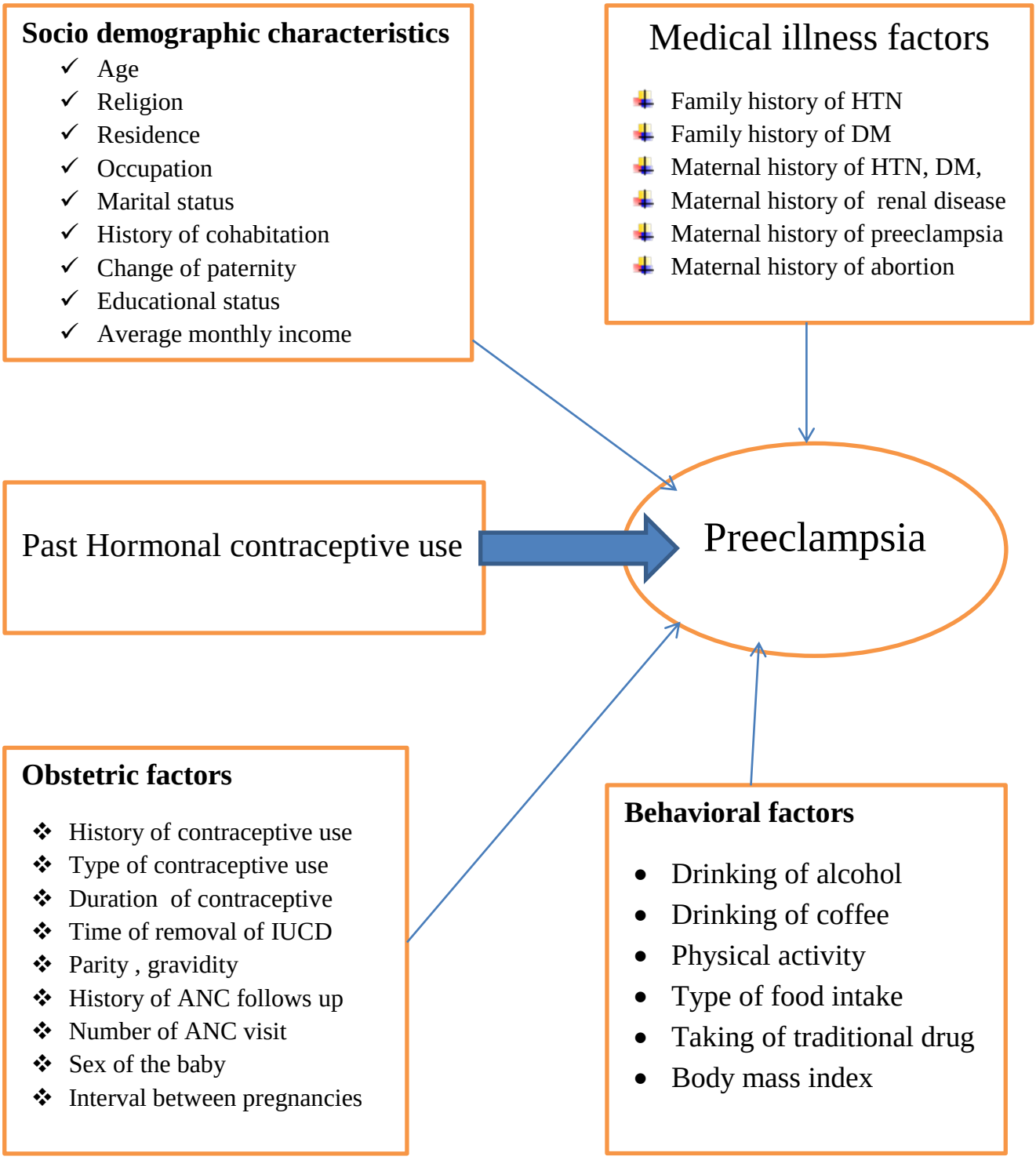

Fig 2:1.Conceptual framework of past hormonal contraceptive use and other possible risk factors and their association with preeclampsia

3. OBJECTIVES

3.1. General objective

❖ To assess the association between past hormonal contraceptive use and preeclampsia at ANC and delivery in Finote Selam, Bure, Debre Markos and Motta Hospitals , Gojjam Zones, Amhara Region, Ethiopia, 2017.

3.2. Specific objectives

- To determine the association between past contraceptive use and preeclampsia among women who came for ANC or admitted for delivery in the selected hospitals.
- To identify factors of preeclampsia among women who came for ANC or admitted for delivery service in the selected hospitals.

Research questions:

Is there association between past hormonal contraceptive use and preeclampsia?

Is there any other factor that associated with preeclampsia?

Hypothesis: **HO:** There is no association between past hormonal contraceptive use and preeclampsia

HA: There is association between past hormonal contraceptive use and preeclampsia

4. METHODS

4.1. Study area and period

The study was conducted in the four Hospitals of Gojjam zones, Amhara Region, Ethiopia, from August 2016 to October, 2017. Amhara Region is the second largest region by its population next to Oromia Region. The Region has nine Zones and one City Administration. Among these the two Zones are West Gojjam Administrative and East Gojjam Administrative Zones. Finote Selam is the town of West Gojjam Administrative Zone whereas Debre Markos is the town of East Gojjam Administrative Zone. The towns are found in Southern direction of Amhara Regional State about 387 Kilometer and 299 Kilometer from Addis Ababa (capital City of Ethiopia) respectively.

In these Zones there are about sixteen public hospitals and one private hospital. Among the public hospitals four hospitals (Finote Selam District Hospital, Bure, Motta Hospital and Debremarkose Referral Hospital) have high patient flow compared to other hospitals. Most of these hospitals provide service in outpatient department, emergency department, gynecology and obstetrics ward, medical ward and pediatrics ward. Finote Selam and Bure Hospitals are found in West Gojjam Zone whereas Debre Markos Referral Hospital and Motta Hospital are found in East Gojjam Zone.

4.2. Study design

Institution based unmatched case control study was conducted among pregnant women attending ANC and admitted for delivery in obstetrics and gynecology departments. Cases are defined as pregnant women with preeclampsia and who attend ANC or admitted for delivery service in the selected hospitals. These were all pregnant woman whose blood pressure greater than or equal to 140/90mmHg in two separate readings at 4 hours apart and their proteinuria ≥300mg per 24 hours urine collection or dipstick test reading ≥ 1+ after 20 weeks of gestation. They were diagnosed and confirmed by obstetrics and gynecology physicians.

Controls are defined as those pregnant women without preeclampsia who come for ANC or admitted for delivery service in these hospitals. This means pregnant women whose blood pressure is < 140/90 mmHg and proteinuria < 300mg/24 hours or < 1+ in urine dipstick test after 20 weeks of gestation in the same hospitals. Cases and controls were identified through record review and after physician diagnosis during the study period in the ANC clinics and obstetrics and gynecology wards. The diagnosis includes history taking, clinical manifestations, and physical examination and laboratory tests.

4.3. Source population

The source populations were all pregnant women who attend ANC or delivery in Gojjam Zones.

4.4. Study population

The study populations were pregnant women who came for ANC or delivery in Finote Selam, Bure, Debremarkose and Motta hospitals during the study period.

4.5. Study unit

All consecutively selected pregnant women who came for ANC and admitted for delivery in the selected Hospitals

4.6. Inclusion and exclusion criteria

4.6.1. Inclusion criteria for cases

All pregnant women who attended ANC and admitted for delivery and have blood pressure of ≥ 140/90 mmHg and proteinuria ≥ 300mg/24 hours or ≥ 1+ urine dipstick test after 20 weeks of gestation

4.6.2. Inclusion criteria for controls

All pregnant women who attended ANC and admitted for delivery and have blood pressure of < 140/90 mmHg and proteinuria < 300 mg /24 hours or < 1+ in urine dipstick test after 20 weeks of gestation

4.6.3. Exclusion criteria for cases

Pregnant women who had known HTN, eclamsia, pre-existing renal disease and seriously ill were excluded through women's record review.

4.4.4. Exclusion criteria for controls

Pregnant women who had known HTN, eclamsia, pre-existing renal disease and were seriously ill were excluded.

4.7. Sample size determination

The sample size was calculated by using OpenEpi version 2.3.statistical software and the formula of two population differences by assuming the case to control ratio 1: 2 with significant level 95%, power 80% and 2.00 minimum detected odds ratio.

There is no previous study was done in Ethiopia about the association between past hormonal contraceptive use and preeclampsia. Therefore the proportion of contraceptive use among controls is taken in the general population from 2014 Ethiopian MDHS data in Amhara Region. So the sample size was calculated by using the proportion of past hormonal contraceptive use among women without preeclampsia (i.e. among total population) in Amhara Region which was 36.8% and the minimum odds ratio to be detected 2.00. By considering the resources and shortage of time for the study, 2.00 minimum detectable OR was used among preeclamtic women who used hormonal contraceptive. Using this OR the calculated sample size was 300. Ten percent non-response rate was 30. Therefore, the final total sample size was 330 (110cases and 220 controls).

4.8. Sampling procedures

The four Hospitals were selected purposively due to their high patient flow rate among other hospitals which are found in Gojjame Zones.

The cases that fulfill the inclusion criteria were selected consecutively as they are diagnosed to have preeclampsia until the required sample size attained. Then the next immediate two corresponding controls were selected consecutively at the same day and in the same ANC clinics and labour wards.

4.9. Variables of the study

4.9.1. Dependent variable

The dependent variable of this study is preeclampsia status.

4.9.2. Independent variables

The major independent variable of the study is past hormonal contraceptive use.

Other possible factors

I. Socio-demographic factors

- ❖ Age , Religion
- ❖ Residence
- ❖ Marital status
- ❖ History of cohabitation
- ❖ Change of paternity
- ❖ Educational status
- ❖ Occupation
- ❖ Average monthly household income

II. Medical illness factors

- ▪ Family history of HTN, Diabetes maltus
- ▪ History of diabetes maltus and renal disease
- ▪ History of abortion and Preeclampsia

III. Gyne-obstetric factors

- Types and duration contraceptive use
- Time of stop using contraceptives
- Time of removal of IUCD
- Blood group and Rh factor
- Parity and Gravida
- Interval between pregnancies
- History and no- of ANC visits
- Getting of counseling during ANC visit
- Multiplicity of pregnancy
- Sex of the baby

IV. Behavioral factors

- ✓ Alcohol Drinking
- ✓ Coffee drinking
- ✓ Type of food intake
- ✓ Taking of traditional drug
- ✓ Physical activity
- ✓ Body mass index

4.10. Data collection procedures

4.10.1. Data collection instruments (measurements)

The data was collected through record review, measurement and a face to face interview of pregnant women using pretested questionnaire. The measurements included blood pressure, weight, height and urine of the women. They were interviewed about their sociodemographic characteristics, medical history, obstetric factors and behavioral factors by trained and experienced health professionals immediately before and/or after ANC and delivery services.

A questionnaire was prepared by reviewing different literatures including, WHO, DHS, family planning and other documents which are related to preeclampsia and contraceptive methods. Some questions were adopted from questionnaires used in other studies to investigate risk factors of preeclampsia. Then the designed questionnaire was changed from English to Amharic and back translated to English to check its consistency.

Height and weight measurements were taken after the participants take off heavy clothes and wearing light cloth and without shoes. Weight of the women was measured in kilogram and height was measured in centimeter while the women were in standing position. After changing the centimeter to meter, BMI was calculated as weight (Kg) divided by height square (M^2). This implies BMI = Wt/ $(Ht)^2$ = Kg/M^2. Then it was classified based on the World Health Organization (WHO) standards of BMI.

Blood pressure was measured while the women seated in the upright position using a mercury sphygmomanometer apparatus. Before taking the measurement, the participants were allowed to take rest for 5 minutes. The measurement was taken from participant's right hand which covers two-thirds of the upper arm. Standard mercury sphygmomanometer was used throughout the study to minimize measurement error. To ensure its accuracy the apparatus was checked by measuring other data collector's blood pressure. The cuff inflated at a rate of 2–3 mmHg per second. Second BP measurement was taken after 4hours. If the second measurement becomes ≥ 140/90 mmHg, then she was checked again after 4 hours to confirm the diagnosis.

Data regarding proteinuria and other clinical data was taken from the women's medical records or midstream urine sample was taken for each case and control if no previous records. Then proteinuria was assessed using urine dipstick method and part of the routine investigation for all pregnant women during the study period.

4.10.2. Data collection personnel

Twenty personals (12 BSC midwives, 4 lab technicians and 4 MSC Health professionals) were recruited as data collector and supervisor respectively in the four hospitals.

4.11. Operational definition

Preeclampsia is defined as gestational hypertension [systolic blood pressure (SBP) ≥140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg] after 20 weeks of gestation and the presence of proteinuria. Women who have a protein level of 1+ during the assessment of urine dipstick test classified as having proteinuria [3].

Gestational hypertension is defined as SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg after 20 gestation weeks in the absence of proteinuria, or any of the aforementioned systemic findings, and resolving before 12 postpartum weeks [3].

Chronic hypertension corresponds to hypertension existing before pregnancy, or appearing before 20 gestational weeks, and persisting more than 12 postpartum weeks [3].

Superimposed preeclampsia is new-onset proteinuria appearing after 20 gestation weeks in a previously hypertensive woman [3].

Change of paternity: Women who married more than once or being pregnant currently married with other new husband.

Past hormonal contraceptive use: Ever using of different types of hormonal contraceptives before current pregnancy

4.12. Data processing and analysis

After data collection the data was coded, entered and cleaned using EPI-info version7 software. Then the entered data was transformed to excel and saved as comma delimited (.csv) and analyzed using STATA version 14. Descriptive analysis like frequency, mean and standard deviation (SD) were carried out and association between preeclampsia and each variable was checked using bivariate logistic regression and those variables with p value less than 0.05 was included in the final multiple logistic regression model to get the best fit model. The crude and adjusted OR with 95% CI was presented using tables and figures.

4.13. Data quality management

Training was given for data collectors and supervisors about two days before data collection. A clear explanation about the purpose of the study was provided for the respondents at the beginning of the interview. A pretest was conducted in 18(5.0%) respondents (6 cases and 12 controls) before one week of actual data collection in other hospitals to check its consistency and any ambiguousness of the questionnaire. Then based on the result of the pretest, some modification was done on the questionnaire. A close supervision was carried out by supervisors and the principal investigator during data collection procedures. The data from each respondent was checked for its completeness, clarity, consistency and accuracy by the data collectors and principal investigator.

4.14. Ethical consideration

An official approval and ethical clearance letter was obtained from Research Ethics Review Committee of School of Public Health and Institutional Review Board of College of Health Sciences. Similarly, an official support letter was obtained from School of Public Health to each selected hospital. Another official support letter was obtained from each administer office in the selected hospitals. Finally an informed consent was obtained from each respondent after explaining the purpose of the study. Confidentiality and privacy of the respondents response was maintained during data collection, analysis and reporting of the findings using computer password.

4.15. Dissemination of the results

The results will be presented to School of Public Health for partial fulfillment for Masters of Public Health, Addis Ababa University. It will also disseminate to the four hospital administrative offices where the study was conducted, West and East Gojjam Zonal Health Bureaus and International Planned Parenthood Federation-Family Guidance Association of Ethiopia. The result will also be disseminated through presentations on specific conferences and through publication.

5. RESULTS

5.1. Descriptive statistics results

5.1.1. Socio-demographic characteristics of the respondents

Almost half 57(51.8%) of the cases and 121(55.0%) controls were found in the age range of 20-29 years. The mean age of case and controls was 28 years (28 ± 6 SD), 27 years (27±5 SD) respectively. Concerning educational status, about 65(59.1%) of case and 105(47.7%) of controls had no formal education. Majority of the participants were Orthodox Christian followers of whom 109(99.1%) were cases and 215(97.7%) were controls. (Table 5:1).

Table 5:1 Sociodemographic characteristics of women attended ANC and delivery service in hospitals of Gojjam, Amhara Region, Ethiopia, 2017

Socio-demographic characteristics		Case(110) n(%)	Control(220) n(%)
Mother's age (years)	< 20 years	30(27.3)	70(31.8)
	20-29 years	57(51.8)	121(55.0)
	30-39 years	21(19.1)	27(12.3)
	40- 49 years	2(1.8)	2(0.9)
Mother's education	Cannot read and write	51(46.4)	81(36.8)
	Can read and write only	14(12.7)	24(10.9)
	Primary school	10(9.1)	31(14.1)
	Secondary school	8(7.3)	37(16.8)
	Diploma and above	27(24.6)	47(21.4)
History of cohabitation	Yes	51(46.4)	69(31.4)
	No	59(53.6)	151(68.6)
Marital Status	Currently Married	107(97.3)	218(99.1)
	Currently unmarried	3(2.7)	2(0.9)
Change of paternity	Yes	31(28.2)	24(10.9)
	No	79(71.8)	196(89.1)
Occupation	Housewife	44(40.0)	105(47.7)
	Merchant	12(10.9)	30(13.6)
	Government employee	23(20.9)	36(16.5)
	Farmer	28(25.5)	41(18.6)
	*Other	3(2.7)	8(3.6)
Current residence	Urban	55(50.0)	120(55.6)
	Rural	55(50.0)	100(45.4)
Average monthly income	<1200 Birr	49(44.6)	89(40.6)
	1200-2400 Birr	18(16.4)	53(24.1)
	2400 – 3600 Birr	17(15.4)	30(13.5)
	>3600 Birr	26(23.6)	48(21.8)

** Other: Student laborer, hotel, café and restaurant worker n: frequency*

5.1.2. Medical factors of preeclampsia

Among the medical factors of preeclampsia family history of hypertension 10(9.1%) and previous history of preeclampsia 6(8.6%) were more common among pregnant women with preeclampsia compared with non-preeclamtic women. Among the respondents 3(50.0%) of cases and 3(42.9%) controls their father had history of hypertension. About two (1.8%) of cases and 2(0.9%) of controls had family history of diabetes Maltus (Table 5:2).

Table 5:2. Distribution of medical illness factors of women attending ANC and delivery in Gojjam Zone hospitals, 2017

Medial illnesses		**Case(110) n(%)**	**Control(220) n(%)**
Family history of HTN	Yes	10(9.1)	7(3.2)
	No	100(90.9)	213(96.8)
Family history of DM	Yes	2(1.8)	2(0.9)
	No	108(98.2)	218(99.1)
History of abortion	Yes	24(21.8)	20(9.1)
	No	86(78.2)	200(90.9)
Number of abortion	1	20(83.3)	17(85.0)
	2	4(16.7)	3(15.0)
Maternal history of preeclampsia	Yes	6(8.6)	2(1.7)
	No	64(91.4)	116(98.3)
Maternal history of renal disease	Yes	9(8.2)	21(9.5)
	No	101(91.8)	199(90.5)

Note: HTN: Hypertension, DM: Diabetes Maltus

5.1.3. Obstetrics factors

Among women who attended ANC or delivered in Gojjame zone hospitals nearly half 48(43.6%) of cases and 71(32.3%) of controls were gravida one. Similarly, about 16(14.5%) cases and 14(6.4%) controls had multiple pregnancy. Among the respondent 98(89.1%) of cases and 207(94.1%) of controls attended ANC during current pregnancy (Table 5:3).

Table 5:3 Obstetrics factors of women attended ANC and deliver service in Gojjame zones, 2017

Obstetric factors		Case n(%)	Control n(%)
Gravidity	Gravida 1	48(43.6)	71(32.3)
	Gravida 2-4	45(40.9)	112(50.9)
	Gravida ≥5	17(15.5)	37(16.8)
Parity	Nulliparous	53(48.2)	90(40.9)
	Parous	57(51.8)	130(59.1)
IBI between the last and current pregnancy	< 5 years	34(54.8)	81(54.4)
	≥ 5 years	28(45.2)	68(45.6)
Multiplicity of current pregnancy	Single	94(85.5)	206(93.6)
	Multiple	16(14.5)	14(6.4)
Sex of the neonate	Male	90(81.8)	166(75.4)
	Female	15(13.6)	51(23.2)
	Did not known	5(4.6)	3(1.4)
Ever attended ANC	Yes	98(89.1)	207(94.1)
	No	12(10.9)	13(5.9)
Gestational HTN	Yes	25(25.5)	9(4.4)
	No	73(74.5)	198(95.6)

Note: ANC: Antenatal Care, HTN: Hypertension, IBI: Inter birth interval

5.1.4 Behavioral factors of preeclampsia

In this study about 87(79.1%) of cases and 176(80.0%) of controls ever drunk alcohol. Among the different types alcohol Tella was more frequently drunk with a frequency of 1-2 days per week. Similarly, among the study participants who were ever drunk coffee 89(80.9%) were cases and 181(82.3%) were controls. Nearly half 50(45.5%) of the cases consumed foods containing excess salt and 40(36.4%) were having physical exercise during current pregnancy compared with 82(37.3%) and 81(36.8%) controls respectively. However, pregnant women with preeclampsia were using less fruit 75(68.2%) and 72(65.5%) vegetable during the current pregnancy than controls 172(78.2%) and 155(70.5%) respectively. Seventy four (67.3%) cases and 151(68.6%) controls ever eaten fatty foods during the current pregnancy. About 11(10.0%) of cases and 8(3.6%) controls took traditional drug during their current pregnancy. About 5(4.5%) of cases and 9(4.1%) of controls were less than the normal range of body mass index. In other hand, 41(37.3%) cases and 67(30.5%) controls were in the range of 25-29.9Kg/M^2.

In this study, majority of the cases 108(98.2%) were Rh positive and 11(10.0%) were controls. About 11(10.0%) of cases and 17(7.7%) of controls had AB blood group. Similarly, 42(38.2%) of the cases and 82(37.3%) of controls had O blood group.

5.1.5. Contraceptive use related results

Concerning the contraceptive methods used by the study participants, about 95(86.4%) of cases and 176(80.0%) of controls were using contraceptives before their current pregnancy. Among these only 1 (0.9%) of case and 1 (0.45%) of controls were using IUCD whereas11 (11.7%) and 17(9.7%) of cases and controls were using oral contraceptives respectively (Table 5:4)

Table 5:4: Types and duration of contraceptive used in the selected hospitals of Gojjame zones, 2017

Contraceptive use		Cases n(%)	Controls n(%)
Contraceptive used during cohabitation	Yes	38(92.7)	45(90.0)
	No	3(7.3)	5(10.0)
Ever used contraceptives before current pregnancy	Yes	95(86.4)	176(80.0)
	No	15(13.6)	44(20.0)
Ever used OC before current pregnancy	Yes	11(11.7)	17(9.7)
	No	83(88.3)	158(90.3)
Duration of OC (pills) used	<1.5 years	3(27.3)	9(52.9)
	≥1.5 years	8(72.7)	8(47.1)
Ever used injectable before current pregnancy	Yes	79(84.0)	141(80.6)
	No	15(16.0)	34(19.4)
Duration of injectable used	< 2.5 years	17(21.5)	33(23.4)
	≥ 2.5 years	62(78.5)	108(76.6)
Ever used implants before current pregnancy	Yes	12(12.8)	41(23.4)
	No	82(87.2)	134(76.6)

Similarly, pregnant women who attended ANC and delivery service in the selected hospitals of Gojjam zones were using hormonal contraceptives before current pregnancy. Among these OC, Injectable and implants were most frequently used contraceptives before current pregnancy (Fig.5.3)

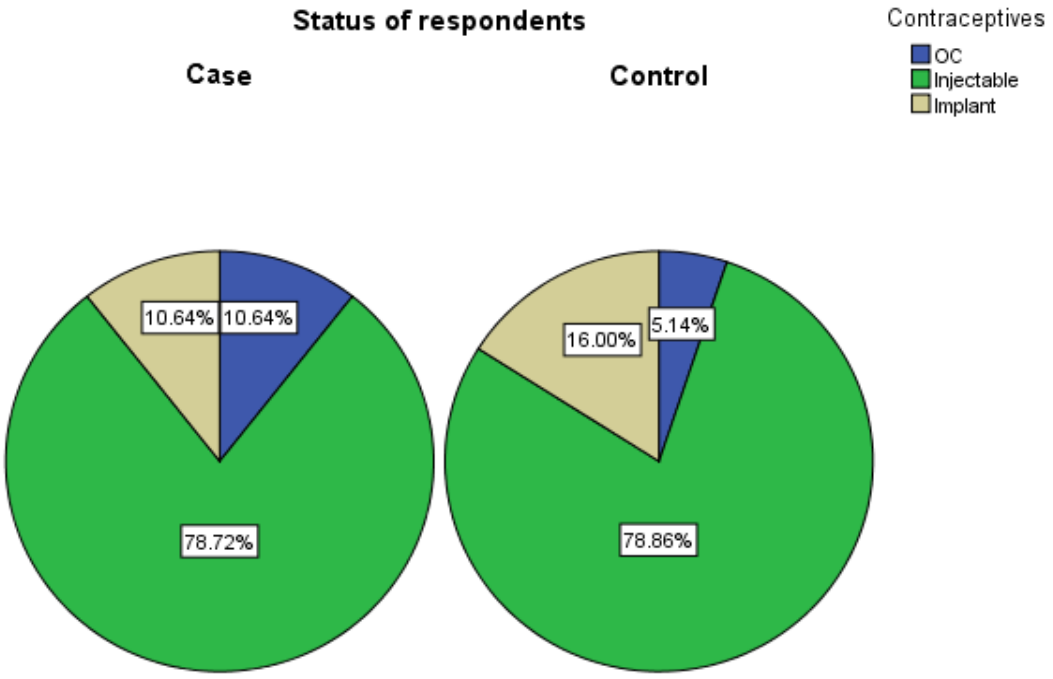

Fig.5.3: Mostly used modern contraceptives before current pregnancy among women attended ANC and delivery in Gojjam zone hospitals, 2017

5.2. Bivariate and multivariate logistic regression results of the study

5.2.1. Bivariate logistic regression analysis results of the study

Those women who were at the age range of 30 or more were 2.12(95%CI: 0.29-15.45) times more likely to develop preeclampsia compared with other age groups. Similarly, pregnant women who had previous history of cohabitation were 1.89 (95% CI: [1.18-3.03]) times more likely to develop preeclampsia compared with controls. Women who were not currently married were 3.1(95% CI: [0.50-18.56]) times more likely to develop preeclampsia compared with those who were currently married. Regarding educational status, pregnant women who have completed secondary school and above were 0.38(95% CI: [0.15-0.92]) less likely to have preeclampsia compared with those pregnant women who have completed less than secondary school or no education at all.

In the medical illness factors pregnant women with family history of hypertension were more likely to develop preeclampsia compared with those who did not have this medical illness. Those women who had history of abortion were also experienced higher odds of preeclampsia compared with controls.

Concerning contraceptive utilization, preeclamtic women who were using hormonal contraceptive method before current pregnancy were 1.58 (95% CI: [0.84-2.99]) higher the odds of women who did not use contraceptives before current pregnancy but the association was insignificant. Similarly, there was non-significant association between cases and controls on the use of oral and injectable contraceptives with preeclampsia (COR = 1.23, 95%CI: [0.55-2.75], COR = 2.27, 95%CI: [0.65-2.47]) respectively.

However, there was significant association between use of implant and preeclampsia among case and controls. Those preeclamtic women who were using implants were 0.48[95% CI: 0.24 - 0.96] times less likely to develop preeclampsia compared with non- preeclamtic women. The crude odds ratio of IUCD was not computed due to small number of success responses.

In other hand, duration of oral contraceptive use was insignificant risk factors of preeclampsia. Women who were using OC for ≥ 1.5 years before current pregnancy were 2.99[95%CI: 0.59-15.36] times more likely to develop preeclampsia compared with those who were using less than this time period. But, no association was observed between duration injectable use and preeclampsia on those who were using for ≥2.5 years or less than this time period (COR=1.11, 95%CI: 0.57-2.16).

Those primigravida women were 1.68[95%CI: 1.02- 2.78] times more likely to develop preeclampsia compared with women with gravida two to four. Even though the association was insignificant, women with gravida five or more were1.14 [95%CI: 0.58-2.24] higher odds experienced than the odds of those women with gravida 2 to 4.

Those preeclamtic women with BMI greater than 30Kg/M^2 were 1.53[95% CI: 0.42 - 5.63] times more likely to develop preeclampsia compared with controls. Those pregnant women who took traditional drug

during current pregnancy were 2.90(95% CI: [1.14, 7.55]) times higher the odds of those who did not take traditional drugs during current pregnancy (Table 5:5 *and annex V).*

Table 5: 5 Crude odds ratio output of binary logistic regression women attending ANC and delivery in selected hospitals of Gojjam zones, 2017

Variables		Case n(%)	Control n(%)	COR(95% CI)	p-value
Educational status	Cannot read and write	51(46.4)	81(36.8)	1.1[0.61-1.98]	0.076
	Can read and write only	14(12.7)	24(10.9)	1.02[0.45-2.29]	0.097
	Primary school	10(9.1)	31(14.1)	0.56[0.24-1.32]	0.019
	Secondary school	8(7.3)	37(16.8)	0.38[0.15-0.93]	0.033
	Diploma and above	27(24.5)	47(21.4)	1	
Family history of HTN	Yes	10(9.1)	7(3.2)	3.04[1.13 - 8.23]	0.028
	No	100(90.9)	213(96.8)	1	
Gravidity	Primigravida	48(43.6)	71(37.7)	1.68[1.02- 2.78]	0.043
	Gravida 2-4	45(40.9)	112(45.5)	1	
	Gravida ≥5	17(15.5)	37(16.8)	1.14[0.58-2.24]	0.069
Multiplicity of pregnancy	Single	94(85.5)	206(93.6)	1	
	Multiple	16(14.5)	14(6.4)	2.50[1.17 - 5.34]	0.018
History of abortion	Yes	24(21.8)	20(9.1)	2.79[1.46 - 5.32]	0.002
	No	86(78.2)	200(90.9)	1	
History of cohabitation	Yes	51(46.4)	69(31.4)	1.89[1.18-3.03]	0.008
	No	59(53.6)	151(68.6)	1	
Ever used implants before current pregnancy	Yes	12(12.8)	41(23.4)	0.48[0.24 - 0.96]	0.039
	No	82(87.2)	134(76.6)	1	
Change of paternity for current pregnancy	Yes	31(28.2)	24(10.9)	3.2[1.77- 5.80]	0.0001
	No	79(71.8)	196(89.1)	1	
Ever eaten fruit during current pregnancy	Yes	75(68.2)	172(78.2)	0.60[0.36 - 0.99]	0.050
	No	35(31.8)	48(21.8)	1	
Traditional drug used during this pregnancy	Yes	11(10.0)	8(3.6)	2.94[1.15 - 7.55]	0.025
	No	99(90.0)	212(96.4)	1	
Maternal Rh(rhesus) factor	Positive	108(98.2)	203(92.3)	1	
	Negative	2(1.8)	17(7.7)	4.52[1.03- 19.94]	0.046

Note: ANC: Antenatal care, HTN: Hypertension, COR: Crude odds ratio, CI: Confidence interval

5.2.2. Multivariate logistic regression result of the study

Multivariate logistic regression analysis was performed to identify the independent associated factors of preeclampsia. The variables with p-value less than 0.05 in bivariate logistic regression analysis were entered into multivariate logistic regression to get the best fitted model.

Those pregnant women who had history of abortion were 3.17[1.31-7.70] times more likely to develop preeclampsia compared with controls. Similarly pregnant women with history of paternity change for the current pregnancy were 3.16[1.67-6.83] times more likely to develop preeclampsia than women without history of paternity change. In addition to this, those pregnant women who had multiple pregnancies were 2.68[1.10-6.58] times more likely to develop preeclampsia compared with singleton pregnancy.

In other hand the association of family history of hypertension and preeclampsia did not be significant in multivariate analysis. Similarly, pregnant women who had history of cohabitation were 1.89[1.18-3.03] times higher odds of experiencing preeclampsia compared with those who did not have history of cohabitation but this association disappeared in the multivariate analysis.

However, those pregnant women who used implant contraceptive method were 59% less likely to develop preeclampsia compared with controls. In addition, pregnant women who had ever eaten fruit during current pregnancy were 64% less likely to develop preeclampsia compared with those pregnant women who did not ever eaten fruit during current pregnancy (Table 5:6).

Table 5:6 Multivariate analysis output of AOR women attended ANC and delivery in the selected hospitals, Gojjam zones, 2017

Characteristics		Case n(%)	Control n(%)	95% CI COR 95% CI	AOR 95% CI
Educational status	Can't read and write	51(46.4)	81(36.8)	1.1[0.61-1.98]	0.66[0.27-1.51]
	Read and write only	14(12.7)	24(10.9)	1.02[0.45-2.29]	0.80[0.28-2.30]
	Primary school	10(9.1)	31(14.1)	0.56[0.24-1.32]	0.52[0.18-1.48]
	Secondary school	8(7.3)	37(16.8)	0.38[0.15-0.93]	0.39[0.12-1.26]
	Diploma and above	27(24.5)	47(21.4)	1	1
Family history of HTN	Yes	10(9.1)	7(3.2)	3.04[1.13-8.23]	3.60[0.84-15.50]
	No	100(90.9)	213(96.8)	1	1
History of cohabitation	Yes	51(46.4)	69(31.4)	1.89[1.18-3.02]	1.69[0.87-3.27]
	No	59(53.6)	151(68.6)	1	1
Change of paternity	Yes	31(28.2)	24(10.9)	3.2[1.77- 5.80]	**3.16[1.47-6.83]**
	No	79(71.8)	196(89.1)	1	**1**
History of abortion	Yes	24(21.8)	20(9.1)	2.79[1.46-5.32]	**3.17[1.31-7.70]**
	No	86(78.2)	200(90.9)	1	**1**
Ever used implants	Yes	12(12.8)	41(23.4)	0.48[0.24 -0.96]	**0.41[0.18-0.93]**
	No	82(87.2)	134(76.6)	1	**1**
Gravidity	Gravida 1	48(43.6)	71(32.3)	1.68[1.02-2.78]	1.60[0.84-3.04]
	Gravida 2-4	45(40.9)	112(50.9)	1	1
	Gravida ≥ 5	17(15.5)	37(16.8)	1.14[0.58-2.24]	1.13[0.51-2.54]
Multiplicity of pregnancy	Single	94(85.5)	206(93.6)	1	**1**
	Multiple	16(14.5)	14(6.4)	2.75[1.24 -6.11]	**2.68[1.10-6.58]**
Maternal Rh factor	Positive	108(98.2)	203(92.3)	1	1
	Negative	2(1.8)	17(7.7)	4.5[1.03-19.94]	2.52[0.47-13.48]
Traditional drug used	Yes	11(10.0)	8(3.6)	2.94[1.15 -7.55]	1.76[0.52-5.93]
	No	99(90.0)	212(96.4)	1	1
Ever used fruit	Yes	75(68.2)	172(78.3)	0.60[0.36-0.99]	**0.36[0.18-0.72]**
	No	35(31.8)	48(21.7)	1	**1**

COR: Crude Odds Ratio, AOR: Adjusted odds ratio, HTN: Hypertension, MBI: Body Mass Index, n: frequency

6. DISCUSSION

There was strong significant association between change of paternity in current pregnancy and preeclampsia (AOR =3.16). This result was in line with a study done in Egypt and Ethiopia [40, 50] and also in a study done on the impact of change in partners and the increased frequency of preeclampsia after donor insemination and oocyte donation [20]. This finding revealed the hypothesis that parental human leukocyte antigen sharing may have a role in the etiology of preeclampsia [40]. It may also be due to psychosocial stress to adapt with the new partner. In addition to this divorce may have a role on this association since, the magnitude of divorce increased now a days.

History of abortion was another important risk factor for the development of preeclampsia (AOR = 3.17. The finding was comparable with a study done in Thailand [42] but the odds ratio in a study done in Thailand was higher (OR = 4.5) which may be due to different study population (both clinical setting and community which may cause selection bias) and small simple size as well as different in socioeconomic and genetic factors between the two countries. A cofounder may also be existed because the 95% CI was wider in the previous study compared with this study.

According to the current study pregnant women with multiple pregnancies were 2.68 times higher the odds of developing preeclampsia compared with those with singled pregnancy. This was consistent with a study done in Thailand and Uganda [42, 43]. This may be due to greater trophoblastic volume and fetal antigen load [6] and/or the large placental size which leads to impaired placental perfusion [7]. However there was no association existed in a study done in Brazil [36] which may be due to the small sample size in that study or recall bias in studies.

Those preeclamtic primigravida women were 1.68 times more likely to experience preeclampsia compared with those with gravida 2 to 4 which was consistent with a study done in Uganda [42] but the association disappeared in the multivariate analysis. This may be due to small sample size for in the current study compared with that of Uganda. This may be due to that the women at first pregnancy may prone to stress about her pregnancy and not be aware about nutrition preference and ANC follow up during pregnancy.

Those women who did not attend ANC were 2.11 times more likely to develop preeclampsia compared with those who attended ANC. The result was consistent with previous study in United states [41] but the odds ratio of current study was higher than the previous study which may be due to the cross-sectional nature of the design, the data source and the outcome variable was a combination of preeclampsia and eclamsia in that study.

Concerning contraceptive use those women who were using implant contraceptive before current pregnancy were 59% less likely to develop preeclampsia compared with those who were using other hormonal contraceptive methods. This finding was in line with a study done in Thailand [42]. This may be

due to fewer doses of the hormone, containing only progesterone hormone and adapting with in the body. However no significant association was observed in a study conducted in China [59]. This result variation may be due to difference in data sources because in the previous study the data was collected by reviewing previous medical records of the women which may have mistaken records or measurement errors. But the current data source was primary data sources obtained by direct measurement and face to face interview of the study participants. In addition to this there may be due to the cross sectional nature of the design and the non-specificity of the outcome variable (Hypertensive disorders during pregnancy) as well as differences in socioeconomic and lifestyles between these countries.

In other hand, there was insignificant association between using of other hormonal contraceptives before current pregnancy and preeclampsia (COR= 1.58). Specifically, there was insignificant association between oral contraceptive use and preeclampsia (COR= 1.5). This finding was consistent with a study conducted in New York where the study included only educated women [34]. In contrast, hormonal contraceptive was a risk factor for preeclampsia as a study done in Indonesia (AOR=2.5) [58] which may be due to small sample size and the result may also be cofounded by passive smoking in the area.

On the duration of hormonal contraceptive use those preeclamtic women who were using OC for one and half years or more before current pregnancy were 2.99 times higher the odds of those women without preeclampsia. In addition to this, those women who were using injectable contraceptives for $\geq$ 2.5 years before current pregnancy were 1.1 times higher the odds of those who were using less than this time period. The result was consistent with a study conducted in Spain, Australia and United States [55, 56, 57] but both of the findings were insignificant.

Concerning behavioral factors those pregnant women who were using fruits during current pregnancy were 64% less likely to develop preeclampsia than those women who did not use fruits in current pregnancy. The result was consistent with case control studies conducted in Egypt and Ethiopia [40, 50]. This may be due to getting of adequate antioxidants, which are mainly found in fruit, reduce the occurrence of oxidative stress in turn reduces the risk of developing preeclampsia. However, using of vegetables during current pregnancy was not significantly associated with preeclampsia.

In other hand, alcohol consumption was preventive factor in Mulago hospital, Uganda [43] but in this study there was no significant association between alcohol use and preeclampsia. This may be due to the inclusion criteria difference that was restricted on women who came to the hospital less than 15 km and age range 15-39. However those women who came from distance far from 15km and age range 40-49 may have different exposure for alcohol. It may also be due to variation in the amount, ingredients and duration of alcohol consumed between the two countries.

7. STRENGTH AND LIMITATIONS OF THE STUDY

7.1 Strength of the study

The area of the study is current health issue in both developed and developing countries because most of maternal complications during pregnancy are reduced in the world but preeclampsia is still exponentially increasing. The previous studies were focusing on pregnancy induced hypertensive disorders in general. Since, the risk factors for different types of these diseases are quite different, this study focuses only on preeclampsia and deeply investigated the possible risk factors.

The study design used in this study is most appropriate design for the proposed research question and enabled to identify all the possible risk factors of preeclampsia. Other strength was conducting the study in the two zones including the four hospitals, using of large sample size and collecting the data in face to face interview with close monitoring and supervision.

7.2 Limitation of the study

The study included only pregnant women who attended ANC or delivery in Health institutions. Recall bias may be introduced among respondents. To reduce these bias data collectors were informed to use local or national events. Selection bias may also be introduced due to using of consecutive sampling to select the study participants but tried to minimize by taking all the respondents in the hospital and using restriction during selection.

8. CONCLUSION AND RECOMMENDATION

8.1. Conclusion

There was non-significant association between past hormonal contraceptive use and preeclampsia. However, one of the hormonal contraceptive called implants was found to be protective factor for preeclampsia in Gojjame Zones. Family history of hypertension, history of abortion, change of paternity and multiple pregnancies were the risk factors of preeclampsia. In other hand using of implant and ever eating of fruit were preventive factors of preeclampsia.

8.2. Recommendations

8.2.1. For health professionals

Health professionals particularly who are doing in maternity rooms or gynecological and obstetric ward should provide counseling for the women to choose appropriate contraceptive methods and dietary conditions before or during ANC follow up. It is better to encourage women to use implant as priority choice of family planning method. In addition, those women who use modern contraceptive method better to take OC for a short duration rather long duration. They should also alert for pregnant women who have family history of hypertension, multiple pregnancy, history of abortion, and changed paternity during ANC follow up period.

8.2.2. For women at reproductive age groups

Women who used contraceptives better to get advice about their risk and benefit before they take as they want. This is because they have their own preference for each women concerning of their duration and dosage. It is better to use fruits during their pregnancy. Pregnant women also better to attend ANC as much as early in their pregnancy to prevent the complications of preeclampsia.

8.2.3. For researchers

Researchers better to focus on this maternal complication to find other possible causes of preeclampsia by using more strong study design such as cohort/longitudinal and experimental designs with larger sample size and more comprehensive objective questionnaires concerning dietary measurements. The future studies should try to include large population encompassing pregnant women in the community. It is also better to do meta-analysis since the previous findings about the factors of preeclampsia were inconsistent. It is also better to incorporate iron supplementation during pregnancy and MUAC instead of BMI to minimize errors.

8.2.4. For the Ethiopian government

The government is better to give emphasize and consider this maternal complication as one focus area of sustainable development goal to reduce its consequences both on the women and their children. Health extension workers also should be aware of preeclampsia to provide counseling and other preventive

measures in the community. The government also better to encourage and motivate other researchers to do more findings in this area.

8.2.5. For non-governmental organizations (NGOs)

Non-governmental organizations which are doing on maternal and reproductive health better to focus their financial and technical support as well as collaboration with other organizations to reduce and prevent this maternal complication.

9. REFERENCES

1. Jim B, Sharma S, Kebede T, Acharya A. Hypertension in pregnancy: comprehensive update. Cardiol Rev 2010; 18:178-89
2. Marik, P. E. Hypertensive disorders of pregnancy. Postgraduate Medicine,2009; 121(2), 69–76
3. American College of Obstetricians and Gynecologists. Diagnosis and management of preeclampsia and eclampsia: ACOG Practice Bulletin No. 33. Obstet Gynecol 2002; 99:159–167.
4. Ness RB, Markovic N, Harger G, Day R. Barrier methods, length of preconception intercourse, and preeclampsia. Hypertens Pregnancy. 2004;23(3):227-35
5. Davies AM, Dunlop W. Hypertension in pregnancy. In: Barron SL, Thomson AM, editors. Obstetrical Epidemiology. London: Academic Press; 1983: 167-208.
6. Sibai B. Immunologic aspects of preeclampsia. Clin Obstet Gynecol 1991; 34:27-34.
7. Pipkin, FB. Risk factors for preeclampsia. N Engl J Med 2001; 12: 925-926
8. Lykke JA, Langhoff-Roos J, Sibai BM, Funai, EF, Triche EW, Paidas MJ. Hypertensive pregnancy disorders and subsequent cardiovascular morbidity and type 2 diabetes mellitus in the mother. Hypertension 2009; 53: 944-951.
9. Borade PV, Haralkar SJ, Wadagale AV.Hypertensive Disorders of Pregnancy: An Ongoing Holocoust. Natl J Community Med 2014; 5(1): 61-65.
10. Zenebe Wolde[1], Hailemariam Segni[2], Mirkuzie Woldie[3]. Hypertensive disorders of pregnancy in Jimma University specialized hospital. November 2011; Vol. 21, No. 3.
11. Yohannes Tesfay et al. Risk factors of pregnancy related hypertension among women attending maternal health care service in selected public hospitals of Tigray, Ethiopia. August, 2016; Vol. 06, Issue, 08, pp.8904-8911.
12. Wodajo S. & Reddy P. S., Med. Res. Chron., Oct. 2016, 3 (3), 297-306.
13. Baillargeon JP, McClish DK, Essah PA, Nestler JE. Association between the current use of low-dose oral contraceptives and cardiovascular arterial disease: a meta-analysis. J Clin Endocrinol Metab. 2005; 90(7):3863–70.
14. Peterson LS. Contraceptive use in the United States: 1982–90. Advance Data, No. 260, February 14, 1995.
15. United Nations, Department of Economic and Social Affairs, Population Division. Trends in Contraceptive Use Worldwide 2015 (ST/ESA/SER.A/349).
16. Central Statistical Agency [Ethiopia]. 2014. Ethiopia Mini Demographic and Health Survey 2014,2016. Addis Ababa, Ethiopia.
17. Arun Jeyabalan, MD. Epidemiology of preeclampsia: Impact of obesity. 2013 October; 71(0 1)
18. Al-Jameila N, Khan FA, Khan MF, Tabassuma H. A Brief Overview of Preeclampsia. J Clin Med Res and Elmer Press. 2014.
19. Duley L .Maternal mortality associated with hypertensive disorders of pregnancy in Africa, Asia, Latin America and the Caribbean. Br J Obstet Gynaecol 1992; 99(7): 547-553.
20. Dekker G, Sibai B. Primary, secondary, and tertiary prevention of preeclampsia. Lancet. 2001; 357:209-15.
21. Cripe SM, O'Brien W, Gelaye B, Williams MA: Perinatal outcomes of Southeast Asians with pregnancies complicated by gestational diabetes mellitus or preeclampsia. JImmigr Minor Health 2012, 14:747–753

22. Wallis AB, Saftlas AF, Hsia J, Atrash HK (2008) Secular trends in the rates of preeclampsia, eclampsia and gestational hypertension, United States, 1987-2004. Am J Hypertens 21(5): 521-526
23. Herrera JA, Herrera-Medina R, Herrera-Escobar JP, Nieto-Díaz A (2014) Reduction of maternal mortality due to preeclampsia in Colombia--an interrupted time-series analysis. Colomb Med (Cali) 45(1): 25-31.
24. Tabassum Firoz, Harshad Sanghvie.al, Pre-eclampsia in low and middle income countries.25 (2011) 537–548
25. J. U. E. Onakewhor and E. P. Gharoro, "Changing trends in maternal mortality in a developing country," Nigerian Journal of Clinical Practice, vol. 11, no. 2, pp. 111–120, 2008.
26. Federal Democratic Republic of Ethiopia Ministry of Health. Health Sector Development Program IV 2010/11 – 2014/15. 2010.
27. Shey Wiysonge CU, Ngu Blackett K, Mbuagbaw JN. Risk factors and complications of hypertension in Yaounde, Cameroon. Cardiovasc J S Afr. 2004; 15(5):215-9.
28. Mills JL, Klebanoff MA, Graubard BI, Carey JC, Berendes HW. Barrier contraceptive methods and preeclampsia. JAMA. 1991; 265:70–73 PubMed: 1984127
29. ChasanTaber L et al. Prospective study of oral contraceptives and hypertension among women in the United States. Circulation 1996; 94: 483–489.
30. Lolita S.M.D'Souza[1], Joicy Josin[2]. Strengthening the healthcare services to prevent severe Pre-eclampsia and Eclampsia. Journal of International Medicine and Dentistry 2014; 1 (2): 86-89
31. Sibai B, Dekker G, Kupferminc M. Pre-eclampsia. Lancet. 2005; 365: 785 – 799
32. Högberg U (2005) The World Health Report 2005: "make every mother and child count" - are including Africans. Scand J Public Health 33(6): 409-411
33. Bodnar LM, Catov JM, Roberts JM: Racial/ethnic differences in the monthly variation of preeclampsia incidence. Am J Obstet Gynecol 2007, 196:324–32
34. Katie E. Farley , Larissa R. Brunner Huber , Jan Warren-Findlow , Jennifer L. Ersek .The Association between Contraceptive Use at the Time of Conception and Hypertensive Disorders During Pregnancy: A Retrospective Cohort Study of Prams Participants. (2014) 18:1779–1785.
35. Tessema et al. Preeclampsia and associated factors among pregnant women attending antenatal care in Dessie referral hospital, Northeast Ethiopia: a hospital-based study. (2015) 15:73. DOI 10.1186/s12884-015-0502-7
36. Dantas[3], e.tal. Preeclampsia is associated with increased maternal body weight in a northeastern Brazilian population. 2013, 13:159
37. Agustin Conde-Agudelo Perimtal Researcher, JosC M. Belizh Director. Risk factors for pre-eclampsia in a large cohort of Latin American and Caribbean women. 2000, 107(1), pp. 75-83
38. Olivier Ngoufack, Andre Youmbi. A Study on Factors Related to Hypertensive Disorders in Pregnancy in Ngaoundere (Adamawa Region, Cameroon). *Clinical Medicine Research.* Vol. 5, No. 2, 2016, pp. 6-12. doi: 10.11648/j.cmr.20160502.11
39. Ashraf Direkvand-Moghadam[1,2], Afra Khosravi[3*] and Kourosh Sayehmiri[1,4] Predictive factors for preeclampsia in pregnant women: a unvariate and multivariate logistic regression analysis. Vol. 59, No 4/2012 673–677

40. Essam A. El-Moselhy; Hamed O. Khalifa; Soliman M. Amer; Khadra I. Mohammad and Hani M. Abd El-Aal, Risk Factors and Impacts of Pre-Eclampsia: An Epidemiological Study among Pregnant Mothers in Cairo, Egypt. Journal of American Science 2011;7 (5):311-323]
41. Bilano VL, Ota E, Ganchimeg T, Mori R, Souza JP (2014) Risk Factors of Pre-Eclampsia/Eclampsia and Its Adverse Outcomes in Low- and Middle-Income Countries: A WHO Secondary Analysis. PLoS ONE 9(3): e91198. doi:10.1371/journal.pone.0091198
42. BL Manandhar[1*], V Chongstuvivatwong[2], A Geater[2]. Antenatal care and severe pre-eclampsia in Kathmandu valley. Journal of Chit wan Medical College 2013; 3(6): 43-47.
43. P. Kiondo et al. Risk factors for pre-eclampsia in Mulago Hospital, Kampala, Uganda, April 2012; volume 17 no 4 pp 480–487.
44. Khosravi, S., Dabiran, S., Lotfi, M. and Asnavandy, M. Study of the Prevalence of Hypertension and Complications of Hypertensive Disorders in Pregnancy. Open Journal of Preventive Medicine, 2014, 4, 860-867.
45. Arusyak Harutyunyan[1]*, Haroutune Armenian[2, 1] and Varduhi Petrosyan1. Interbirth interval and history of previous preeclampsia: a case–control study among multiparous women. 2013, 13:244.
46. JN Lubianca[1], LB Moreira[1, 2], M Gus[1,3] and FD Fuchs[1,3]. Stopping oral contraceptives: an effective blood pressure-lowering intervention in women with hypertension. (2005) 19, 451–455.
47. Uzma Shamsi*, Sarah Saleem and Noureen Nishter. Epidemiology and risk factors of preeclampsia; an overview of observational studies. Al Ameen J Med Sc i 2013; 6(4):292-300.
48. Gilles Guerrier[1], Bukola Oluyide[2], Maria Keramarou[1].Factors associated with severe preeclampsia and eclampsia in Jahun, Nigeria. International Journal of Women's Health 2013:5 509–513
49. Rebecca F Grais1Lisa Chasan-Taber[1], Marushka Silveira1, Penelope Pekow1, Barry Braun[2], JoAnn E. Manson[3], Caren G. Solomon[3], and Glenn Markenson[4]. Physical activity, sedentary behavior and risk of hypertensive disorders of pregnancy in Hispanic women. 2015 February; 34(1): 1–16.
50. Endeshaw, M., Ambaw, F., Aragaw, A. and Ayalew, A. Effect of Maternal Nutrition and Dietary Habits on Preeclampsia: A Case-Control Study. International Journal of Clinical Medicine, 2014, 5, 1405-1416.:
51. Kay-tee khaw, w s peart. Blood pressure and contraceptive use. British medical journal volume 285, No. 7 August 1982, 1973-79.
52. Osungbade KO, Ige OK. Public health perspectives of preeclampsia in developing countries: Implication for health system strengthening. J Pregnancy 2011; 2011:481095.
53. Hyejin Park[1] and Kisok Kim[2]*. Associations between oral contraceptive use and risks of hypertension and prehypertension in a cross-sectional study of Korean women. Park and Kim BMC Women's Health 2013, 13:39.
54. Sadat et al. The Effect of Short Duration Sperm Exposure on Development of Preeclampsia in Primigravid Women. Iran Red Crescent Med J 2012; 14(1):20-24.
55. Eduard Gratac6s[1'3], Pere-Joan Torres1, Vicenc Cararach[1], Lloren9 Quinto[2], Pedro L.AJonso[2] and Albert Fortuny1. Does the use of contraception reduce the risk of pregnancy-induced hypertension, 1996, vol 11 no 10 pp 2138-2141.

56. Christine L Chiu and Joanne M Lind*. Past oral contraceptive use and self-reported high blood pressure in postmenopausal women. Chiu and Lind BMC Public Health (2015) 15:54.
57. Lorelei A. Mucci,a Pagona Lagiou,b Chung-Cheng Hsieh ,c e.tal. A prospective study of pregravid oral contraceptive use in relation to fetal growth. An International Journal of Obstetrics and Gynaecology ,September 2004, Vol. 111, pp. 989–995
58. Martha Irene Kartasurya*. Pre-eclampsia Risk factors of pregnant women in Semarang, Indonesia. IJSBAR)(2015) Volume 22, No 1, pp 31-37.
59. Ye C, Ruan Y, Zou L, Li G, Li C, et al. (2014) The 2011 Survey on Hypertensive Disorders of Pregnancy (HDP) in China: Prevalence, Risk Factors, Complications, Pregnancy and Perinatal Outcomes. PLoS ONE 9(6): e100180. doi:10.1371/journal.pone.0100180
60. Parker SE, Jick SS, Werler MM. Intrauterine device use and the risk of pre-eclampsia: a case–control study. BJOG 2016;123:788–795

10. ANNEXES

Questionnaires on assessment of the association between past hormonal contraceptive use and preeclampsia among pregnant women in Gojjam Zone Hospitals, 2017

Annex I: Information and Consent form (English version)

a. Information sheet

How are you? My name is ----------. I am a health personal in this ANC clinic or delivery ward of this hospital. I am going to collect data from this ANC and delivery ward to conduct a research on" the assessment of the association between past hormonal contraceptive use and preeclampsia and to identify risk factors of preeclampsia" by Abiyot Wolie who is MPH student in Addis Ababa University.

The study will help to assess the association of past hormonal contraceptive use and preeclampsia as well as to identify risk factors of preeclampsia. It will also help to find possible prevention and intervention methods as well as to choose better contraceptive methods. The research will be used as a baseline data for policy makers and other interested organizations or individuals who will study further on this area. The data which will be necessary for the study will be extracted from you and your ANC or delivery card records. Therefore your willingness to provide this information is vital to conduct the study.

If you have any questions about this study you may ask me or the principal investigator (Abiyot Wolie Mobile: 0911594003 or email address: abiywol@gmail.com).

b. Consent form

According to the above stated objectives and benefits of the study, you will be selected by chance to participate in this study. The information that you will give will be kept confidential or couldn't be disclosed for other third parties. Your name and personal identity will not be recorded on the data collection form and used for other purpose. The participation is a full of your volunteer and permission. It is your full right to refuse in responding any question or all of the questions but the information that will be taken will be quite useful for the study. You will not face any problem if you do not allow the information to be taken from your records and you will not also be denied of getting any medical services from the hospital. On the other hand, there is no any special benefit by allowing your records to be used and being participant in the study. It will take a maximum of 20-25 minutes to answer these questions.

Are you willing to continue to give your information to be used for this study?

1. Yes, I am willing to participate in this study (Please go to the next page)
2. No, I don't want to participate in this study. (End with thanks)

Annex II: Interviewer administered questionnaires in English version

Name of the hospital: _____ Date of data collection_____

Status: case = 1 and control = 0 **ID** _____

I. **Socio demographic characteristics**

s.no	Questions	Response category	Skip
101	What is your age in complete years?	_____years old	
102	What is your religion?	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Other (specify) --------	
103	What is your marital status?	1. Never married 2. Married 3. Divorced 4.Widowed	
104	If your answer for Qno- 103 is **married** when were you married?	--------- years	
105	Are you living with your husband currently?	1. Yes 2. No	
106	What is your occupation?	1. Housewife 2. Merchant 3. Government employee 4. Student 5. Other(specify)------	
107	What is your educational level?	1. Can't read and write 2. Can read and write only 3. Primary school(1-8) 4. Secondary school(9-12) 5. Diploma and above	
108	Where are you currently living?	1. Urban 2. Rural	
109	What is your household monthly income?	_____ETB.	
	II. Medical illness factors		
201	Have your families ever had hypertension?	1. Yes 2. No	204
202	If your response for question no. 201 **"yes"** who had?	1. Father 2. Mother 3. Grandfather 4. Grandmother 5. Other (specify_____)	
203	Have your families ever had diabetes maltus?	1. Yes 2. No	205
204	If your response for question no. 203 "**yes"** who had?	1. Father 2. Mother 3. Grandfather 4. Grandmother 5. Other (specify_____)	
205	Had your family ever had preeclampsia?	1. Yes 2. No	207
206	If your response for question no. 205 **"yes"** who had?	1. Mother 2. Grand mother 3. Sister 4. Other (specify)	
207	Have you ever had history of hypertension?	1. Yes 2. No	
208	Have you ever had history of diabetes?	1. Yes 2. No	
209	Have you ever had history of renal disease?	1. Yes 2. No	
210	Have you been pregnant before this pregnancy?(Include all pregnancies that ended in life births, spontaneous or induced abortions and stillbirth)	1. Yes 2. No	301
211	If your answer for Qno- 210 **"yes"** what was your age at your 1st pregnancy?	_____ years old	
212	Have you ever had history of preeclampsia?	1. Yes 2. No	
213	Have you ever had history of eclamsia?	1. Yes 2. No	
III. Gynecological and obstetric history			
301	How many times have you been pregnant in your life including this?	____ times	

302	What was the time interval between previous and this pregnancy?	__months __ years	
303	How many times have you given birth in your life?	----times	
304	What is the multiplicity of current pregnancy?(fill this after delivery if the multiplicity is unknown during pregnancy)	1. Single 2. Twins 3. Other 4. Not known	
305	What is the sex of newborn for this pregnancy?(fill this after delivery if the sex of new born is unknown during pregnancy)	1. Male 2. Female 3. Not known	
306	Did you want to get the current pregnancy?	1. Yes 2. No	
307	Have you ever attended ANC clinic for this pregnancy?	1. Yes 2. No	312
308	How many ANC clinic visit did you have?	_____ times	
309	Have you given counseling at your ANC follow up?	1. Yes 2. No	
310	Had you been told that you had gestational HTN during that pregnancy?	1. Yes 2. No	
311	Had you been told that you had gestational DM during that pregnancy?	1. Yes 2. No	
312	Had you ever had history of induced abortion?	1. Yes 2. No	314
313	If your answer for Qno- 312 is "**yes"** how many times did you have?	-------- times	
314	Did you have time of cohabitation with your husband?	1. Yes 2. No	316
315	If your answer for Qno. 314 "**yes"** did you have sexual contact?	___month(s)/___yr(s)	
316	If "Yes" did you ever used contraceptive method?	1. Yes 2. No	320
317	If your answer is "Yes" When did you use contraceptive for the first time?	In --------- years	
318	Which one did you use?(more than one choice is possible)	1. Pills 2. Depo 3. Implant 4. IUCD 5. Condom 6.other	
319	Among these which one was you used mostly?	Specify ----------	
320	Did you use contraceptive method before this pregnancy?	1. Yes 2. No	337
321	If your answer for question no. 320 **"yes"** which type?	1. Modern 2. Traditional	
322	If your answer for question no. 321 "**modern"** which type did you use? (More than one choice is possible)	1. Pills 2. Injectable 2. Implants 4. IUCD 5.Condom 6.Other (specify_____)	
323	Among these which type did you use mostly?	Specify----------	
324	If your answer for question no. 322 **"pills"** for how long did you use?	For ---- yrs and -----months	
325	When did you stop taking of this contraceptive method?	----day/ ---month/-----years	
326	Why did you stop taking of this contraceptive method?	Reason----------	
327	If your answer for question number 322 "**Injectable"** how long did you use?	____ months /___yrs	
328	When did you stop using of this contraceptive method?	__day/__month/__yr	
329	Why did you stop taking of this contraceptive method?	Reason----------	
330	If your answer for question number 322 "**Implant"** which one?	1. For 3 years(Implanon) 2. For 5 years(Jaddle)	
331	How many times inserted this method?	----------times	
332	When did you stop using of this contraceptive method/ remove this method?	__day/__month/__yr	
333	Why did you remove this contraceptive method?	Reason----------	
334	Have you ever used IUCD?	1. Yes 2. No	
335	If your answer for question number 334 "**yes",** which type (in year)?	Specify _____	
336	When did you remove this contraceptive method?(filled in the card)	__day/__month/__ yr	
337	Did you change paternity after previous pregnancy?	1. Yes 2. No	

IV. Behavioral factors

401	Have you ever drunk alcohol during this pregnancy?	1. Yes 2. No	404
402	If your answer in question no. 401 "**yes",** which type?	1. Beer 2. Tela 3. Katicala/Areqie 4. Tej 5. Other (specify_____)	
403	If your answer in question no. 401 **"yes",** How often?	1. Everyday 2. At least ___days per week	

		3. At least ---days per month 4. I stopped after-- weeks GA	
404	Have you ever drunk coffee?	1. Yes 2. No	406
405	If your answer in question no. 404 "**yes",** How often?	1. Everyday 2. At least ___days per week 3. At least --- days per week 4. I Stopped after weeks GA	
406	Have you ever chewed chat?	1. Yes 2. No	408
407	If your answer for question no. 406 "yes", how often?	1. At least ____times per day 2. At least ____times per week 3. I Stopped after __weeks of GA	
408	Had you ever taken traditional medicine?	1. Yes 2. No	
409	Have you got information about physical activity during this pregnancy?	1. Yes 2. No	
410	Have you ever doing physical exercise during pregnancy	1. Yes 2. No	
411	Have you ever eating vegetables during this pregnancy?	1. Yes 2. No	413
412	If your answer for question no. 411 "**yes",** how often?	1. Everyday 2. At least _____times per week 3. At least _____times per month 4. I Stopped at __weeks of GA	
413	Have you ever eating fruit during this pregnancy?	Yes 2. No	415
414	If your answer for question no. 413**"yes",** how often?	1. Everyday 2. At least --- times per week 3. At least ----- times per month 4. I Stopped after __weeks of GA	
415	Have you ever taken salty foods prior/ during this pregnancy?	1. Yes 2. No	
416	Have you ever been eating fatty foods?	1. Yes 2. No	501
417	If your answer for question no. 416 **"yes"** which you have ever been mostly eating?	1. Red raw meat 2. Butter 3. Cooked meat 4.Highly fatty contained meat 5. Other (specify)---------	
418	If your answers for question no. 417"have chosen" how often have you ever been mostly eating?	1. At least __ times per week 2. At least ___times per month 3. I stopped after ----weeks GA	

V. Data that will be obtained by reviewing woman's record or by measurement

501	Blood pressure of the mother	_____mmHg	
502	Weight of the mother	_____Kg	
503	Height of the mother	_____Cm	
504	Last menstrual period of current pregnancy(LMP)		
505	Expected date of delivery(EDD)		
506	Gestational age (GA)		
507	Blood group and Rh factor of the mother		
508	Proteinuria level of the mother/urine dipstick test		
509	Hemoglobin level of the mother		

Thank you

Data collector name and signature: signature ---------- Name ----------

በአማራ ክልል በጎጃም ዞኖች ውስጥ በሚገኙ ሆስፒታሎች የእርግዝና ክትትል ለማድረግ ወይም ለመውለድ ከመጡ ነፍሰጡር እናቶች ላይ ከ 20 ሳምንት የእርግዝና ጊዜ በኋላ የሚከሰት የደም ግፊት ከሆርሞናል የእርግዝና መቆጣጠሪያ ዘዴዎች ጋር ያለውን ዝምድናና ሌሎች መንስኤዎችን ለመዳሰስ የተዘጋጀ ቃለ-መጠይቅ

ሀ. ለጥናቱ ተሳታፊዎች ስለጥናቱ መረጃ መስጫ ቅጽ

እንደምን ዋሉ? ስሜ----------ይባላል። በዚህ ሆስፒታል ውስጥ በሚገኘው የቅድመ ወሊድ መከታተያ ክፍል፣ ወሊድ ወይም ድህረ-ወሊድ ክፍል ውስጥ የምሰራ የጤና ባለሙያ ነኝ።አሁን ወደዚህ የመጣሁት በዚህ ክፍል ውስጥ የእርግዝና ክትትል እያደረጉ ያሉ ነፍሰጡር እናቶች እና ለወሊድ የመጡ እናቶችን ከ20 ሳምንት እርግዝና በኋላ የሚመጣ የደም ግፊትን በተመለከተ ከወሊድ መከላከያ ጋር ያለውን ዝምድናና ሌሎች መንስኤዎችን በተመለከተ መረጃ ለመሰብሰብ ነው።ጥናቱን የሚያጠናው አብዮት ወሌ የተባለ የአዲስ አበባ ዩኒቨርሲቲ የድህረ-ምረቃ ተማሪ ነው።

ጥናቱ ላይ መሳተፍ አሁን ለእርስዎ ያን ያህል ጥቅም ባይኖረውም የሚሰጡኝ መረጃ ግን በማነኛውም ነፍሰጡር እናቶች ላይ በእርግዝና ጊዜ ለሚከሰት የደም ግፊት መንስኤውን ለመዳሰስ እና የተሻሉ አማራጭ የመከላከያ ዘዴዎችን ለመጠቀም ጥቅም ይኖረዋል ተብሎ ይታሰባል።

እንዲሁም የጥናቱ ውጤት በዚህ ዙሪያ መስራት ለሚፈልጉ ግለሰቦች፣ ተቋማትና ፖሊሲ አርቃቂዎች እንደግባት ይጠቅማል ተብሎ ይታሰባል።ለጥናቱ የሚያስፈልገው መረጃ ከእርስዎ የመረጃ ካርድ እና እርስዎ ቃለ-መጠይቅ ሲጠየቁ በሚሰጡት መረጃ ነው። ስለዚህ እርስዎና የእረስዎ መረጃ ለመስጠት ፈቃደኝነት ይህን ጥናት ለማከሔድ ወሳኝና በጣምአ ስፈላጊ ነው።

ይህን ጥናት በተመለከተ ማነኛውንም አይነት ጥያቄ እኔን ወይም የጥናቱን ባለቤት(አብዮት ወሌን) ከዚህ በታች በተጠቀሰው አድራሻ መጠየቅ ይችላሉ።

ስልክ ቁጥር ፡ 0911 59 40 03 ኢ-ሜል ፡ abiywol@gmail.com

ለ. ለጥናቱ ተሳታፊዎች የፈቃደኝነት መጠየቂያ ቅጽ

ከላይ በተገለጸው የጥናቱ ዓላማና ከሚሰጠው ጥቅም አንጻር እርስዎ ለጥናቱ ከሚያስፈልጉ እናቶች መካከል በጥናቱ እዲሳተፉ ተመርጠዋል። እርስዎ የሚሰጡን መረጃ በማንኛውም ሁኔታ ከእኔና ካጥኝው በስተቀር ለሌላ ሶስተኛ ወገን አይታይም ወይም አይሰጥም።

ስምዎና የእርስዎ ግለሰባዊ ማንነት ከመረጃ መሰብሰቢያው ቅጽ ላይ አይጻፍም ወይም ከጥናቱ ዓላማ ውጭ ለሌላ ጥቅም አይውልም። በጥናቱ ለመሳተፍ የእርስዎ በጎ ፈቃደኝነት ወሳኝ ሲሆን ያለ መሳተፍም ወይም ጥያቄውን ሲጠየቁ በማነኛውም ጊዜ ማቆምይችላሉ። መረጃ ለመስጠት ፈቃደኛ ባለመሆንዎም ምንም አይነት ችግር አይደርስብዎትም ወይም በሆስፒታሉ ውስጥ ከሚያገኙት የጤና አገልግሎት ጉዳት አይደርስዎበትም። ነገር ግን ከላይ እንደነገርሁዎት እርስዎ የሚሰጡት መረጃ ለጥናቱ በጣም ጠቃሚ ነው። በሌላ በኩል በጥናቱ ለሚሳተፉት ተሳትፎ ምንም አይነት የተለየ ክፍያ ወይም ጥቅማጥቅም አይሰጥዎትም። እነዚህን ጥያቄዎች ለመመለስ ቢበዛ 20 ደቂቃ ሊወስድ ይችላል።

መረጃ ለመስጠት ፈቃደኛነዎት?

1. አዎፈቃደኛ ነኝ። (አመሰግነው ወደ ሚቀጥለው ገጽ ይሂዱ።)
2. ፈቃደኛ አይደለሁም። (አመስግነው ይሰናበቱ።)

የሆስፒታሉ ስም፡ ---------- መረጃው የተሰበሰበበት ቀን ፡ ----------

ሁኔታ፡ ግፊቱ ያለባቸው = 1 ግፊቱ የሌለባቸው = 0 የካርድ ቁጥር፡----------

I. ማህበራዊና ኢኮኖሚያዊ ሁኔታዎች

ተ.ቁ	ጥያቄዎች	የመልስ አማራጮች	ይለፍ
101	እድሜዎ ስንት ነው?	_____ዓመት	
102	ሀይማኖትዎ ምንድን ነው?	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቲስታንት 4. ካቶሊክ 5. ሌላ ካለ ይግለጹ--------	
103	የጋብቻዎ ሁኔታስ?	1. አላገባሁም 2. አግብቻለሁ 3. አግብታ የፈታች 4. ባሏየሞተባት	
104	ለጥያቄ ቁጥር 103 መልስዎ **“አግብቻለሁ”** ከሆነ ከባለቤትዎ ጋር አብረው ነው የሚኖሩት?	1. አዎ 2. አብረን አይደለንም	
105	ለጥያቄ ቁጥር 103 መልስዎ“**አግብቻለሁ”**ከሆነ ከባለቤትዎ ጋር የተጋቡት መቼ ነበር?	---------- ዓመት	
106	ስራዎ ምንድን ነው?	1.የቤት እመቤት 2. ነጋዴ 3. የመንግስት ሰራተኛ 4. ተማሪ 5. ሌላ(ይግለጹ) ------	
107	የትምህርት ደረጃዎ ስንት ነው?	1. ማንበብና መጻፍ የማይችል 2. ማንበብና መጻፍ የሚችል 3. 1ኛ ደረጃ (1-8) 4. 2ኛ ደረጃ (9-12) 5.. ዲፕሎማና ከዚያ በላይ	
108	ባሁኑ ሰዓት የሚኖሩት ሄት ነው?	1. ከተማ 2. ገጠር	
109	የቤተሰብዎ አማካይ የወር ገቢ ምን ያህል ነው?	_____የኢትዮጵያ ብር	

II. ጤናና ጤናነክ ችግር ጥያቄዎች

201	በቤትዎ ውስጥ ግፊት የነበረበት ሰው ነበር?	1. አዎ 2. የለም	203
202	ለጥያቄ ቁጥር 201 መልሰዎ **“አዎ “** ከሆነ ማን ነበር?	1. አባት 2. እናት 3. ወንድ አያት 4. ሴት አያት 5. ሌላ ካለ ይግለጹ_____	
203	ከቤተሰብዎ አባላት ውስጥ የስኳር በሽታ የነበረበት ሰው ነበር?	1. አወ 2. አልነበረም	205
204	ለጥያቄ ቁጥር 203 መልሰዎ “**አዎ**” ከሆነ ማን ነው የነበረበት?	1. አባት 2. እናት 3. ወንድ አያት 4. ሴት አያት 5. ሌላ ካለ ይግለጹ_____	
205	ከቤተሰብዎ አባላት ውስጥ ከ 5ወር እርግዝና በኋላ ግፊት የነበረበት ነበረ?	1. አዎ 2. የለም	207
206	ለጥያቄ ቁጥር 205 መልሰዎ **“አዎ ”** ከሆነ ማን ነው የነበረበት?	1.እናት 2. ሴት አያት 3. እህት 4. ሌላ-----	
207	ነፍሰጡር ከመሆንዎ በፊት በጤና ባለሙያ ግፊት አለብዎት ተብለው ነበር?	1. አዎ 2. የለም	
208	ከዚህ በፊት በጤና ባለሙያ ስኳር አለብዎት ተብለው ነበር?	1. አዎ 2. የለም	
209	በጤና ባለሙያ የሽንትቧንቧ/ኩላሊት በሽታ አለብዎት ተብለው ያውቃሉ?	1. አዎ 2. የለም	
210	ከዚህ በፊት ነፍሰጡር ሁነው ያውቃሉ? (ሁሉንም እርግዝናዎች ያጠቃልላል)	1. አዎ 2. የለም	301
211	መልሰዎ **አዎ** ከሆነ ለመጀመሪያ ጊዜ ነፍሰጡር ሲሆኑ እድሜዎ ስንት ነበር?	_____ ዓመት	
212	ከዚህ በፊት ነፍሰጡር በነበሩ ጊዜ ከ 5 ወር እርግዝና በኋላ ግፊት ነበረብዎት? (ከዚህ በፊት ወልደውለነበሩ)	1. አዎ 2. የለም	
213	ከዚህ በፊት ነፍሰጡር በነበሩ ጊዜ ከ5 ወር እርግዝና በኋላ እራስዎን እስከመሳት ያደረሰ ግፊት ነበረበትዎ? (ከዚህ በፊት ወልደው ለነበሩ)?	1. አዎ 2. የለም	

III. የቤተሰብ ምጣኔን፣የእርግዝናና ወሊድ ሁኔታን የሚመለከቱ ጥያቄዎች

301	ይህንን እርግዝና ጨምሮ እስካሁን ስንት ጊዜ ነፍሰጡር ሁነዋል?	_____ ጊዜ	
302	ከዚህ በፊት በነበረውና ባሁኑ እርግዝና መካከል ያለው ጊዜ ስንት ነው?	--------ወር/------ዓመት	
303	እስካሁን ድረስ ስንት ጊዜ ወልደዋል?	--------- ጊዜ	
304	የዚህ እርግዝና የጽንስ ብዛት ስንት ነው? (በቅደመ ወሊድ ክትትል ጊዜ ወይም ከወሊድ በኋላ የሚሞላ)	ነ. አንድ 2. መንታ 3. ሌላ----- 4. አይታወቅም	
305	የጽንሱ/የልጅዎ ጾታ ምንድን ነው? (በቅደመ ወሊድ ክትትል ጊዜ ወይም ከወሊድ በኋላ የሚሞላ)	ነ. ወንድ 2. ሴት 3. አይታወቅም	
306	እርግዝናውን ፈልገውት ነው ያረገዙት?	1. አዎ 2. አይደለም	
307	የቅደመ ወሊድ ክትትል ነበርዎት?	1. አዎ 2. አላደርግም	312
308	መልስዎ **አዎ** ከሆነ ስንት ጊዜ የቅደመ ወሊድ ክትትል አድርገው ነበር?	_____ ጊዜ	
309	ክትትል ሲያደርጉ የምክር አገልግሎት እያገኙ ነበር?	1. አዎ 2. የለም	
310	በዚያን ጊዜ በጤና ባለሙያ ከእርግዝናው ጋር በተየያዘ የደም ግፊት አለብዎት ተብለው ነበር?	ነ. አዎ 2. የለም	
311	በዚያን ጊዜ ከእርግዝና ጋር የተገናኘ ስኳር አለብዎት ተብለው ነበር?	ነ. አዎ 2. የለም	
312	ከዚህ በፊት የፅንስ መቋረጥ ወይም ውርጃ አጋጥመዎት የውቃል?	1. አዎ 2. የለም	314
313	መልስዎ **አዎ** ከሆነ እስካሁን ስንት ጊዜ አጋጥመዎታል?	----------ጊዜ	
314	ከዚህ እርግዝና በፊት ከባለቤትዎ ጋር የእፅኝነት ጊዜ ነበርዎ?	1. አዎ 2. የለም	316
315	ለጥያቄ ቁጥር 315 መልስዎ "**አዎ**" ከሆነ በእጮኝነት ቆይታችሁ የግበረስጋ ግንኙነት ነበራችሁ?	1. አዎ 2. የለም	
316	መልስዎ አዎ ከሆነ የወልድ መቆጣጠሪያ ተጠቅመው ያውቃሉ?	1. አዎ 2. የለም	320
317	መልስዎ አዎ ከሆነ ለመጀመሪያ ጊዜ የተጠቀሙት መቼ ነበር?	በ----------ዓ.ም	
318	የቱን ነበር ይተቀሙ የነበር? (ከአንድ በላይ መምረጥ ይቻላል)	ነ. እንክብል 2. በመርፌ የሚሰጠውን 3. በክንድ ቆዳ ስር የሚቀመጥ 4. በማህጸን የሚቀመጠውን 5. ኮንዶም 6. ሌላ	
319	ከእነዚህ የወሊድ መቆጣጠሪዎች ውስጥ በብዛት ይጠቀሙ የነበር የቱን ነበር?	ይግለጹ----------	
320	ከዚህ እርግዝና በፊትስ የወሊድ መቆጣጠሪያ ይጠቀሙ ነበር?	1. አዎ 2. የለም	337
321	ለጥያቄ ቁጥር 320 መልስዎ **አዎ** ከሆነ የቱን ነበር ይጠቀሙ የነበር?	1. ዘመናዊ 2. ባህላዊ	
322	ለጥያቄ ቁጥር3 21 መልስዎ "**ዘመናዊ**" ከሆነ የትኛውን ዘዴ ነበር ይጠቀሙ የነበር? (ከአንድ በላይ መምረጥ ይቻላል)	1. እንክብል 2. በመርፌ የሚሰጠውን 3. በክንድ ቆዳ ስር የሚቀመጥ 4. በማህጸን የሚቀመጠውን 5. ኮንዶም 6. ሌላ	
323	ከእነዚህ የወሊድ መቆጣጠሪዎች ውስጥ ብዙን ጊዜ ይጠቀሙ የነበር የቱን ነበር?	ይግለጹ ----------	
324	ለጥያቄ ቁጥር 322 መልስዎ "**እንክብል**" ከሆነ ለምን ያህል ጊዜ ተጠቅመዋል?	ለ --- አመት እና ለ--- ወራት	
325	ይህን የወሊድ መቆጣጠሪያ ዘዴ መውሰድያ ቆሙት መቼ ነበር?	በ----ቀን/___ ወር/____ ዓ.ም	
326	ይህን የወሊድ መቆጣጠሪያ ዘዴ መውሰድ ያቆሙት ለምን ነበር?	ምክንያቱን ይግለጹ	
327	ለጥያቄ ቁጥር 322 መልስዎ" **በመርፌ የሚሰጥ**"ከሆነ ለምን ያህል ጊዜ ተጠቅመዋል?	ለ --- አመት እና ለ--- ወራት	
328	ይህን የወሊድ መቆጣጠሪያ ዘዴ መውሰድ ያቆሙት መቼ ነበር?	በ----ቀን/___ ወር/____ ዓ.ም	
329	ይህን የወሊድ መቆጣጠሪያ ዘዴ መውሰድ ያቆሙት ለምን ነበር?	ምክንያቱን ይግለጹ	

330	ለጥያቄ ቁጥር 322 መልስዎ ″**በክንድ ቆዳ ስር ሚቀመጥ”** ከሆነ ለምን ያህል ጊዜ ተጠቅመዋል?	ለ --- አመት እና ለ--- ወራት	
331	ለጥያቄ ቁጥር 330 መልስዎ የስንት ዓመቱን ነበር ይጠቀሙ የነበር?	1. የ 3 ዓመቱን(ኢምፕላኖን) 2. የ 5 ዓመቱን(ጃድል)	
332	ይህን የወሊድ መቆጣጠሪያ ዘዴ መውሰድ ያቆሙት መቼ ነበር?	---ቀን / --- ወር / ---- ዓመት	
333	ይህን የወሊድ መቆጣጠሪያ ዘዴ መውሰድ ያቆሙት ለምን ነበር?	ምክንያቱን ይግለጹ	
334	በማህጸን ውስጥ የሚቀመጥ የወሊድ መቆጣጠሪያ ዘዴ**(ሉፕ)** ተጠቅመው ያውቃሉ?	1. አዎ 2. የለም	
335	ለስንት አመት የሚያገለግለውን ሉፕ ነበር ይጠቀሙ የነበር	---------- ዓመቱን	
336	ከማህጸንዎ ያሰዎጡት መቼ ነበር? (ካርድ በማየት የሚሞላ)	__ቀን/__ ወር/__ ዓ.ም	
337	የአሁኑን እርግዝናዎ ሌላ የትዳር አጋር አግብተው ነው ያረገዙት?	2. አዎ 2. አይደለም	

IV. ሰነ-ባህሪን የሚማለከቱ ጥያቄዎች

401	አልኮል ይጠጡ ነበር?	ነ. አዎ 2. አልጠጣም	404
402	ለጥያቄ ቁጥር 401 መልስዎ ‘‘**አዎ”** ከሆነ የትኛውን አይነት?	ነ. ቢራ 2. ጠላ 3. አረቄ 4. ጠጅ 5. ሌላ ካለ ይግለጹ----------	
403	ለጥያቄ ቁጥር 401 መልስዎ **“አዎ**’’ ከሆነ ለምን ያህል ጊዜ?	1) በየቀኑ 2) በሳምንት ቢያንስ ----- ቀን 3) በወር ቢያንስ ------ቀን 4) ነፍሰጡር ከሆንሁ ከ---ሳምንት በኋላ አቁሚያለሁ	
404	ቡና ይጠጡ ነበር?	ነ. አዎ 2. አልጠጣም	406
405	ለጥያቄ ቁጥር 404 መልስዎ ‘‘አዎ’’, ከሆነ ለምን ያህል ጊዜ?	1. በየቀኑ 2. በሳምንት ቢያንስ ----- ቀን 3. በወር ቢያንስ ------- ቀን 4. ነፍሰጡር ከሆንሁ ከ----ሳምንት በኋላ አቁሚያለሁ	
406	ጫት ይቅሙ ነበር?	ነ. አዎ 2. አልቅምም	408
407	ለጥያቄ ቁጥር 406 መልስዎ ‘‘አዎ’’, ከሆነ ለምን ያህልጊዜ?	1. በየቀኑ 2. በሳምንት ቢያንስ ----ቀን 3. በወር ቢያንስ -----ቀን 4. ነፍሰጡር ከሆንሁ ከ-- ሳምንት በኋላ አቁሚያለሁ	
408	ነፍሰጡር እያሉ የባህል መድሃኒት ወስደው ነበር?	1. አዎ 2. አልወሰድሁም	
409	በእርግዝና ጊዜ ስለአካል ብቃት እንቅስቃሴ መረጃ ያገኙ ነበር?	ነ. አዎ 2. አላገኝም	
410	ነፍሰጡር እያሉ ያካልእንቅስቃሴ ያደርጉ ነበር?	ነ. አዎ 2. አላደርግም	
411	ነፍሰጡር እያሉ አትክልት ይመገቡ ነበር?	ነ. አዎ 2. የለም	413
412	ለጥያቄ ቁጥር 411 መልስዎ **“አዎ”**ከሆነ ለምን ያህል ጊዜ?	1. በየቀኑ 2. በሳምንት ቢያንስ ----- ጊዜ 3. በወር ቢያንስ --------ጊዜ 4. ነፍሰጡር ከሆንሁ ከ---ሳምንት በኋላ አቁሚያለሁ	
413	ነፍሰጡር እያሉ ፍራፍሬ ይመገቡ ነበር?	1. አዎ 2. አልተመገብሁም	415
414	ለጥያቄ ቁጥር 414 መልስዎ **“አዎ”** ከሆነ ለምን ያህል ጊዜ?	1. በየቀኑ 2. በሳምንት ቢያንስ ------- ጊዜ 3. በወር ቢያንስ ----------ጊዜ 4. ነፍሰጡር ከሆንሁ ከ---ሳምንት በኋላ አቁሚያለሁ	
415	ነፍሰጡር በነበሩበት ጊዜ ጨው የበዛበት ምግብ ይመገቡ ነበር?	ነ. አዎ 2. የለም	
416	ነፍሰጡር እያሉ ቅባትነት ያላቸውን ምግቦች ይመገቡ ነበር?	1. አዎ 2. የለም	501
417	ለጥያቄ ቁጥር 416 መልስዎ ‘‘አዎ’’, ከሆነ በአብዛኛው የሚመገቡ የቱን ነበር?	ነ. ቀይ ጥሬ ስጋ 2. ቅቤ 2. የበሰለ ስጋ 3. ስብ የበዛበት ስጋ 4. ሌላ --------	
418	ለጥያቄ ቁጥር 417 ለመለሱት ምርጫዎ ለምን ያህል ጊዜ?	ነ. በሳምንት ቢያንስ --------ጊዜ 2. በወር ቢያንስ ----------ጊዜ 3. ነፍሰጡር ከሆንሁ ከ--ሳምንት በኋላ አቁሚያለሁ	

V. ከእርግዝና መከታተያ ካርድ ላይ በማየት ወይም በመለካት የሚሞሉ መረጃዎች

501	የደም ግፊት መጠን	----------mmHg	
502	የእናትዮዋ ክብደት	----------ኪግ	
503	የእናትዮዋ ቁመት	----------ሴ.ሜ	
504	የወር አበባ የቀረበት የመጨረሻ ቀን (LMP)	----------	
505	የመውለጃ ጊዜ ግምት/ ትወልዳለች ተብሎ የሚታሰበው ቀን/ EDD	----------	
506	የጽንሱ እድሜ (GA)	----------	
507	የደም ወገን / ዓይነት	----------	
508	የፕሮቲንዩሪያ መጠን/ ዩሪን ዲፕስቲክ ቴስት	----------	
509	የሄሞግሎቢን መጠን	----------	

አመሰግናለሁ።

የመረጃ ሰብሳቢው ስምና ፊርማ፡ ፊርማ ---------- ስም----------

ANNEX V: Table of bivariate analysis results of with COR and p-value women attended ANC and delivery service in the selected hospitals, Gojjam Zones, 2017

Characteristic		Case(110) n(%)	Control(220) n(%)	COR(95%CI)	p-value
Mother's age (years)	< 20 years	30(27.3)	70(31.8)	0.91 [.53-1.55]	0.727
	20-29 years	57(51.8)	121(55.0)	1	
	30-39 years	21(19.1)	27(12.3)	1.65[0.86-3.17]	0.131
	40- 49 years	2(1.8)	2(0.9)	2.12[0.29-15.45]	0.457
Mother's education	Cannot read and write	51(46.4)	81(36.8)	1.10[0.61-1.97]	0.760
	Can read and write only	14(12.7)	24(10.9)	1.02[.45-2.29]	0.970
	Primary school	10(9.1)	31(14.1)	0.56[0.24-1.32]	0.186
	Secondary school	8(7.3)	37(16.8)	0.38[.15-0.92]	0.033
	Diploma and above	27(24.6)	47(21.4)	1	
Marital Status	Currently Married	107(97.3)	218(99.1)	1	
	Currently unmarried	3(2.7)	2(0.9)	3.1[0.50-18.56]	0.225
Occupation	Housewife	44(40.0)	105(47.7)	1	
	Merchant	12(10.9)	30(13.6)	0.95[0.452.03]	0.904
	Government employee	23(20.9)	36(16.5)	1.52[.81-2.86]	0.190
	Farmer	28(25.5)	41(18.6)	0.48[0.05-4.20]	0.505
	*Other	3(2.7)	8(3.6)	1.62[0.89-2.96]	0.108
Current residence	Urban	55(50.0)	120(55.6)	1.2[0.76-1.90]	0.436
	Rural	55(50.0)	100(45.4)	1	
Family history of HTN	Yes	10(9.1)	7(3.2)	3.04[1.13-8.22]	0.028
	No	100(90.9)	213(96.8)	1	
Number of abortion	1	20(83.3)	17(85.0)	1.13[0.22-5.79]	0.88
	2	4(16.7)	3(15.0)	1	
Maternal history of renal disease	Yes	9(8.2)	21(9.5)	0.84[0.37-1.91]	0.685
	No	101(91.8)	199(90.5)	1	
Parity	Nulliparous	53(48.2)	90(40.9)	1.34[0.85-2.13]	0.209
	Parous	57(51.8)	130(59.1)	1	
IBI between the last and current pregnancy	< 5 years	34(54.8)	81(54.4)	1.02[0.54-1.78]	0.950
	≥ 5 years	28(45.2)	68(45.6)	1	
Sex of the neonate	Male	92(83.6)	168(76.4)	1.58[0.87-2.86]	0.130
	Female	18(16.4)	52(23.6)	1	
Ever attended ANC	Yes	98(89.1)	207(94.1)	0.51[0.23-1.17]	0.111
	No	12(10.9)	13(5.9)	1	
Ever gotten counseling	Yes	88(89.8)	181(87.4)	1	
	No	10(10.2)	26(12.6)	1.26[0.58-2.74]	0.552
Wanted pregnancy	Yes	102(92.7)	199(90.5)	1	
	No	8(7.3)	21(9.5)	1.35[0.56-3.14]	0.493
Ever used contraceptive during cohabitation	Yes	38(92.7)	45(90.0)	1.40[0.32-6.28]	0.654
	No	3(7.3)	5(10.0)	1	
Ever used contraceptives before current pregnancy	Yes	95(86.4)	176(80.0)	1.58[0.84-2.99]	0.157
	No	15(13.6)	44(20.0)	1	
Ever used OC before current pregnancy	Yes	11(11.7)	17(9.7)	1.23[0.55-2.75]	0.611
	No	83(88.3)	158(90.3)	1	
Duration of OC (pills) used	<1.5 years	3(27.3)	9(52.9)	1	
	≥1.5 years	8(72.7)	8(47.1)	2.99[59-15.36]	0.187
Ever used injectable before current pregnancy	Yes	79(84.0)	141(80.6)	1.27[0.65-2.47]	0.483
	No	15(16.0)	34(19.4)	1	

Duration of injectable ever used	< 2.5 years	17(21.5)	33(23.4)	1	
	≥ 2.5 years	62(78.5)	108(76.6)	1.11[0.57-2.16]	0.749
Ever used implant before current pregnancy	Yes	12(12.8)	41(23.4)	0.48[0.24-0.96]	0.039
	No	82(87.2)	134(76.6)	1	
Duration of implant ever used	< 2.5 years	2(16.7)	10(24.4)	1	
	≥ 2.5 years	10(83.3)	31(75.6)	1.61[0.30-8.63]	0.576
Mostly used contraceptives	OC	10(10.64)	9(5.14)	2.07[0.80-5.32]	0.130
	Injectable	74(78.72)	138(78.86)	1	
	Implants	10(10.64)	28(16.0)	0.67[0.31-1.45]	0.304
Types of maternal blood group	A	29(26.4)	72(32.7)	0.79[0.45-1.39]	0.408
	B	28(25.5)	49(22.3)	1.12[0.62-2.02]	0.718
	AB	11(10.0)	17(7.7)	1.23[0.54-2.94]	0.588
	O	42(38.2)	82(37.3)	1	
Body mass index	BMI <18.5	5(4.5)	9(4.1)	1.28[.41-3.97]	0.672
	BMI 18.5-24.9	60(54.5)	138(62.7)	1	
	BMI 25-29.9	41(37.3)	67(30.5)	1.41[0.86-2.30]	0.174
	BMI ≥ 30	4(3.7)	6(2.7)	1.53[0.42-5.63]	0.520
Ever gotten information about physical exercise	Yes	26(23.6)	68(30.9)	0.98[0.61-1.58]	0.936
	No	84(76.4)	152(69.1)		
Ever done physical exercise during current pregnancy	Yes	40(36.36)	81(36.8)	0.69[0.41-1.17]	0.169
	No	70(63.64)	139(63.2)	1	
Ever used alcohol during current pregnancy	Yes	87(79.09)	176(80.0)	0.95[.53-1.67]	0.847
	No	23(20.91)	44(20.0)	1	
Ever drunk coffee during current pregnancy	Yes	89(80.9)	181(82.3)	0.91[0.51-1.64]	0.762
	No	21(19.1)	39(17.7)	1	
Ever eaten vegetables during current pregnancy	Yes	72(65.5)	155(70.5)	0.79[0.49-1.29]	0.356
	No	38(34.5)	65(29.0)	1	
Ever eaten salt foods during current pregnancy	Yes	50(45.5)	82(37.3)	1.40[0.88-2.23]	0.153
	No	60(54.5)	138(62.7)	1	
Ever eaten fatty foods during current pregnancy	Yes	74(67.3)	151(68.6)	0.94[0.58-1.53]	0.802
	No	36(32.7)	69(31.4)	1	

Note: ANC: Antennal care, BMI: Body mass index, HTN: Hypertension, IBI: Inter birth interval, OC: Oral contraceptive

Investigator's Curriculum Vitae (CV)

I. Personal information

Name: Abiyot Wolie Asres

Sex: Male

Nationality: Ethiopian

Current address: Addis Ababa

Email address: abiywol@gmail.com

Phone number: 0911594003

II. Educational background	**School/ Institution**	**Year**
Primary and Secondary School	Tilili, North West Ethiopia	1996-2005
Preparatory School	Injibara, North West Ethiopia	2006-2007
Higher Education	Debre Markos University	2008-2011
III. Training & certification		
TOT on Effective Teaching Skill	Hawassa	2013
TOT on BEMONC	Arba-Minch	2014
SBM-R training	Mizan-Aman	2014
PMTCT option B+	Mizan-Aman	2015
Clinical Teaching Skill (CTS)	Mizan-Aman	2015
Training workshop on UHEP	Butajira	2015
IV. Work experience		
Rank	**Place of work**	**Duration**
Graduate assistant II	Mizan-Aman College of Health Science	2 years
Assistant Lecturer	Mizan-Aman College of Health Science	1 year
Department Head of Health Extension	Mizan-Aman College of Health Science	8 months

ADVISORS' CURRICULUM VITAE

BIOGRAPHY

NAME: Abigiya Wondimagegnehu Tilahun

eRA COMMONS USER NAME (credential, e.g., agency login): abitowon

POSITION TITLE: Lecturer at School of Public Health, Addis Ababa University

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	START DATE MM/YYYY	END DATE *(or expected end date)* MM/YYYY	FIELD OF STUDY
Mada Walabu University	BSc	09/2008	07/2012	Public Health
Addis Ababa University	MPH	10/2012	07/2014	Public health In Epidemiology

A. Personal Statement

My academic training and specializing on advanced Epidemiology and Biostatistics gave me an exposure to identify research gaps and gave me an opportunity to realize how the substantial emergence of non-communicable diseases is stressing the health service system with the preexisting communicable disease in developing countries. As a public health professional, it is my deep desire to get involved and contribute valid evidences which can enhance prevention and control programs particularly in relation to non-communicable diseases. Having close relatives who are victims of this diseases and being member of non-communicable team in our school, given me a good opportunity to be more familiar with current cancer issues and fascinate me to conduct researches on cancers in relation to mental health through giving more focus on women and children. It is my deep desire to upgrade my knowledge and develop my profession through any means and would like to share my knowledge to the coming generation through publications and participating on different presentations and seminars. In the near future, I believe as I will contribute a lot to the body of evidences with relevant action researches which can fill identified gaps and brought significant improvement in the health care system.

B. Positions and Honors

Positions and Employment

03/2016 – present	Lecturer at Addis Ababa University School of Public Health
02/2016-04/2016	Research Assistant at GAIN on Micronutrient project (Phase II)
08/2016 – 09/2016	Research Assistant at AAU on Substance abuse Project
08/2015 -03/2016	Lecturer, Department of community Health, ALKAN HSBT college
07/2015-08/2015	Research Assistance at Maries topes Ethiopia on permanent FP
06/2014- 03/2015	Health Intern/ EPI at UNICEF, Ethiopia
02/2014-04/2014	Research Assistant at GAIN on Micronutrient project (Phase I)

Other Experience and Professional Memberships

2016-	Member of Academic Staff Promotion Committee
2016-	Assistant coordinator of Field Epidemiology program
2016 -	Member of Women's Health Research Group
2016-	Member of non-communicable disease team at School of Public Health
2012-	Member Ethiopian Public Health Association

Honors and grants

2016	Thematic research grant (Member of the team)
2016	Adaptive research grant (Co Investigator)
2012-2014	Addis Ababa university female scholarship

C. Contribution to Science

- I was part of a project conducted on "Choice of place of delivery in Agarfa Town Bale Zone Oromia Region Ethiopia" Being undertaken for partial fulfillment of BSc Degree, Mada Walabu University, June 2012
- I conducted research on "Assessment of association between Perinatal CMD and Breast Feeding Practice among Postnatal Women in Butajira**. A Retrospective Cohort Study**" MPH thesis paper, being undertaken for partial fulfillment of MPH Degree, Addis Ababa University, School of Public health, June 2014.
- I was co-investigator of a research on "Awareness and Perception towards Cleft Lip and Cleft Palate in West Showa Zone, Oromia Region, Ethiopia, 2016."

D. Research Support : Ongoing Research Support

Impact of Print media on breast Cancer screening in Addis Ababa, Ethiopia. (A Randomized control trail)
Depression and Psychotherapy among Breast Cancer Patients in Ethiopia.
Promoting the application of the Rapid Ethical Assessment (REA) approach to enhance the ethical conduct of NTD research in Ethiopia. (Qualitative Study)
Esophageal Cancer in Ethiopia (Thematic Research

Primary advisor's curriculum vitae

CURRICULUM VITAE

Dr. Adamu Addissie

P.O. Box 366 Code 1029

Addis Ababa, Ethiopia

E-mail: adamuaddis@yahoo.com

Tel: +251-911-404954 (Cell phone)

+251-115-547319 (Office) / +251-112-700452 (Home)

I. ACADEMIC QUALIFICATIONS

Doctor of Philosophy in Biomedical Ethics **(PhD)**, 2014: Brighton and Sussex Medical School, Universities of Sussex and Brighton, Brighton, UK

Advanced Masters in Bioethics (MA), 2008: Erasmus Mundus Advanced Masters in Biomedical Ethics; Katholic University Leuven (Belgium), University of Nijmegen (The Netherlands) and University of Padova (Italy)

Master's in Public Health (MPH), 2004: Addis Ababa University, Ethiopia

Degree of Doctor of Medicine (MD), 1997: Jimma University, Ethiopia

II. WORK EXPERIENCE

Assistant Professor of Public Health and Epidemiology: (July 2008 till Present); School of Public Health, Addis Ababa University, Addis Ababa, Ethiopia

Assistant Professor of Public Health: (January 2005 - August 2007); Department of Public Health, Debub University, Awassa Health Sciences College, Awassa, Ethiopia

Project Manager and Acting Department Head: (May 2004 - Sept 2005); Medan-ACTS, SIM/USA Supported Comprehensive HIV/AIDS Prevention Care and Support Program, EKHC, Addis Ababa, Ethiopia

General Practitioner and Medical Director: (Nov 1997 – Sept 2002); Hosanna Hospital and Gimbichu Health Centre, Hadya Zone, SNNPR, Ethiopia

III. PUBLICATIONS AND SUBMISSIONS

BOOK: Addissie, A., **2012**, HIV Malaria Co-Infection in Southern Ethiopia Clinical, Bio-medical and Behavioral Study, LAP Lambert Academic Publishing AG & Co. KG.

BOOK CHAPTERS

1. **Addissie, A**. and Tesfaye, M., Ethiopia, In Henk A.M.J. ten Have and Bert Gordijin (eds), Handbook of Global Bioethics, **2014**, Dordrecht, Springler, p 1121-1139
2. Kantelhardt EJ, Bogale S, Mathewos A, Tariku W, Hanson C, **Adamu Addissie**, Breast Cancer in Countries with Limited Resources; In Uwe Groß and Kerstin Wydra (Eds.) Maternal-Child Health Interdisciplinary Aspects Within the Perspective of Global Health, **2013**, Göttingen International Health Network (GIHN), Göttingen, p 519-535
3. Kumbi, S. and **Addissie, A**. Ethics in Reproductive Health Research in Ethiopia. In Mesganaw Fantahun, Yemane Berhane and Aimee Tsu (Eds.), Text Book of Reproductive and Child Health with Focus on Ethiopia and other Developing Countries, **2013**, Addis Ababa, AAU, JHU and EPHA

RECENT PEER REVIEWED JOURNAL PUBLICATIONS

1. **Addissie A**, Abay S, Feleke Y, Newport M, Farsides B, Davey G. (**2016**) Cluster randomized trial assessing the effects of rapid ethical assessment on informed consent comprehension in a low-resource setting. *BMC Medical Ethics* 17:40
2. Abay S, **Addissie A**, Davey G, Farsides B, Addissie T **(2016)** Rapid Ethical Assessment on Informed Consent Content and Procedure in Hintalo-Wajirat, Northern Ethiopia: A Qualitative Study. PLoS ONE 11(6): e0157056. doi:10.1371/journal.pone.0157056
3. Frie KG, Sefonias G, Muluken G, Tariku W, Traoré CB, Kamaté B, Mallé B, Vetter M, Krings A, Tamarat A, **Addissie A**, Mathewos A, Kantelhardt EJ. (2016) Update on Female Cancer in Africa: The AORTIC Conference 2015, Morocco. Breast Care 11:71–72. DOI: 10.1159/000444135
4. Negussie H, Addissie T, **Addissie A**, Davey G (2016) Preparing for and Executing a Randomized Controlled Trial of Podoconiosis Treatment in Northern Ethiopia: The Utility of Rapid Ethical Assessment. *PLoS Negl Trop Dis* 10(3): 1-17. e0004531. doi:10.1371/journal.pntd.0004531
5. Chiu C, Martin C, Woldemichael D, W/Selasie G, Tareke I, Luce R, G/Libanos G, Hunt D, Bayleyegn T, **Addissie A**, Buttke D, Bitew A, Vagi S, Murphy M, Seboxa T, Jima D, Debella A. (2016) Surveillance of a Chronic Liver Disease of Unidentified Cause in a Rural Setting of Ethiopia: A Case Study. *Ethiop Med J, 2016, Vol. 54, No. 1 pp 27-32*
6. Mamushet Y, Zenebe G, **Addissie A**. Medical and Neurological Complications Among Stroke patients Admitted for Inpatient Care in Addis Ababa, Ethiopia. *Ethiop Med J, (**2015**), Vol.53, No.1: 9-17*
7. Kantelhardt EJ, Muluken G, Sefonias G, Wondimu A, Gebert HC, Unverzagt S, **Addissie A**. A Review on Breast Cancer Care in Africa. *Breast Care (**2015**); 10:364–370. DOI: 10.1159/000443156*

8. Defi GB, Belachew A, **Addissie A**, Hailemariam Z. A Malaria Outbreak in Ameya Woreda, South-West Shoa, Oromia, Ethiopia, 2012: Weaknesses in Disease Control. Important Risk Factors. *American Journal of Health Research (**2015**); 3(3): 125-129. doi: 10.11648/j.ajhr.20150303.12*
9. Feleke Y, **Addissie A**, Wamisho BL, Davey G. Review Paper on Research Ethics in Ethiopia : Experiences and Lessons Learnt from Addis Ababa University College of Health Sciences 2007-2012. *Ethiopian Medical Journal*, (**2015)** 53: 7-14
10. **Addissie A**., Davey G., Newport M., Farsides B., Feleke Y., Feasibility of Rapid Ethical Assessment for the Ethiopian Health Reseach Ethics Review System. *Ethiopian Medical Journal*, (**2015)** 53: 25-34
11. Fekadu A.,Teferra, S., Hailu, A. Gebre-Mariam, T. **Addissie, A**., Deressa, W. Yimer, G., Reja, A. International Clinical Trial Day and clinical trials in Ethiopia and Africa. *Trials*, (**2014)**,15:493 doi:10.1186/1745-6215-15-493
12. **Addissie A**, Davey G, Feleke Y, Addissie T, MacGregor H, Newport M, Farsides B. Mixed-Methods Study on Perceptions Towards Use of Rapid Ethical Assessment to Improve Health Research Informed Consent Processes in a Low-Income Setting REA. *BMC Medical Ethics*. (**2014**) 15:35
13. **Addissie A**, Hagos S, Kassie G, Nigatu T, Asnake M. Academic-private sector collaboration in public health operations research (PHOR): The case of Addis Ababa University School of Public Health (AAU-SPH) and the Integrated Family Health Program (IFHP). Ethiopian Journal of Health and Development , Volume 28 (**2014**) Special Issue 1, 1-5
14. Lingerh W, Ababeye B, Ali I, Nigatu T, Abebe H, Mitike G, Molla M, **Addissie A**, Hagos S. Magnitude and factors that affect males' involvement in deciding partners' place of delivery in Tiyo district of Oromia Region, Ethiopia. Ethiopian Journal of Health and Development , Volume 28, (**2014**) Special Issue 1, 6-13
15. Atnafu H, Dires Y, Yeshambaw A, Ali S, Gebeyehu W, Bereda S, Enquoselassie F, Mekonnen A**, Addissie A**, Hagos S. Identification of factors associated with method shift from short-acting to long-acting methods of contraception in Amhara Region of Ethiopia. Ethiopian Journal of Health and Development , Volume 28, (**2014**) Special Issue 1, 14-19
16. Gebru T, Gebre-Egziabher D, Tsegaye K, Hadera B, Addisse M, Tefera W, **Addissie A**, Hagos S. Magnitude and predictors of skilled delivery service utilization: A health facility based cross-sectional study in Tigray. Ethiopian Journal of Health and Development , Volume 28, (**2014**) Special Issue 1, 20-25
17. Gobena M, Nigatu T, Ymam B, Tasisa A, Wagaw D, Birmechu F, Keba D, Ali A, Makonnen W, **Addissie A**, Hagos S. Utilization of Prevention of Mother to child Transmission (PMTCT) services and factors that affect knowledge and service uptake among pregnant women attending antenatal care in Eats Hararge Zone of Oromia Regional State. Ethiopian Journal of Health and Development , Volume 28, (**2014**) Special Issue 1, 26-35
18. Demissie B, Ejie B, Zerihun H, Tafese Z, Gamo G, Tafese T, Kumie A, Haider J, **Addissie A**, Hagos S. Assessment og health care seeking behavior of caregivers for common childhood illnesses in Shashogo Woreda, Southern Ethiopia. Ethiopian Journal of Health and Development , Volume 28, (**2014**) Special Issue 1, 36-43

19. Abdurahmen J, **Addissie A**, Molla, M., Commuity Based Cross-Sectional Study: Preferences of Place of Delivery and Birth Attendants among Women of Shahsmenr Town, Oromia Regiona Ststae 2012, International Journal of Technology Enhancements and Emerging Engiering Research (**2014**) 2 (7):
20. Kantelhardt E, Zerche P, Mathewos A, Trocchi P, **Addissie A,** Aynalem A, Wondemagegnehu T, Ersumo T, Reeler A, Yonas B, Tinsae M, Gemechu T, Jemal A, Thomssen C, Stang A, Bogale S. Breast Cancer Survival in Ethiopia: a Cohort Study of 1,070 Women. *International Journal of Cancer (***2014**) 135 (3): 702-709
21. Kantelhardt E, Mathewos A, Trocchi P, **Addissie A,** Aynalem A, Wondemagegnehu T, Reeler A, Yonas B, Gemechu T, Jemal A, Thomssen C, Stang A, Bogale S. Cervical Cancer in Ethiopia: Survival of 1059 Patients who Received Oncologic Therapy. The Oncologist, **2014**, 19 (7) 727-34
22. Ravinetto R, Afolabi MO, Okebe J, Ilo Van Nuil j, Lutumba P, Mavoko HM, Nahum A, Halidou Tinto h, **Addissie A**, D'Alessandro U, rietens KP. Participation in medical research as a resource-seeking strategy in socio-economically vulnerable communities: call for research and action. Tropical Medicine and International Health, **2014**, doi:10.1111/tmi.12396
23. Gebremariam A, **Addissie A**. Knowledge and perception on long acting and permanent contraceptive methods in Adigrat town, Tigray, Northern Ethiopia: a qualitative study. Int J Family Med. **2014**; 2014:878639. doi: 10.1155/2014/878639. Epub 2014 Jul 21.
24. Gebremariam A**, Addissie A.** Intention to use long acting and permanent contraceptive methods and factors affecting it among married women in Adigrat town, Tigray, Northern Ethiopia. *Reproductive Health*, **2014**, **11**:24 doi:10.1186/1742-4755-11-24
25. Demelash, H. and **Addisie, A**. Assessment of Sexual and Reproductive Health Status of Street Children in Addis Ababa. *Journal of Sexually Transmitted Diseases.* **2013**. (available at http://dx.doi.org/10.1155/2013/524076)
26. Abebe M, **Addissie A,** Regassa T. Fertility Desire and Contraceptive Utilization among People Living With HIV/AIDS on ART in Hosanna Town, Southern Ethiopia. *Science, Technology and Art Journal*. **2012**; 1(4):38-46
27. Jima D, Wondabeku M, Alemu A, Teferra A, Awel N, Deressa W, **Addissie A**, Tadesse Z, Gebre T, Mosher AW, Richards FO, Graves PM. Analysis of malaria surveillance data in Ethiopia: what can be learned from the Integrated Disease Surveillance and Response System. *Malaria Journal*. **2012**; 11:330
28. **Addissie A,** et al, Shigellosis Outbreak in Addis Ababa University. *Ethiopian Medical Journal*. **2011**; 49 (4):
29. Jima D, Mitike G, Hailemariam Z., Bekele A., **Addissie A.**, et al. The Ethiopian Field Epidemiology and Laboratory Program : Strengthening Public Health Systems and Building Human Resource Capacity. *Pan African Medical Journal*. **2011**; 10 (Supplement 1):
30. **Addissie** A. Acute watery diarrheal disease outbreak. *Ethiopian Medical Journal*. **2009**; 47(3):239-40

IV. GRANTS AND AWARDS:

1. Wellcome Trust PhD Studentship in Biomedical Ethics, a three years research grant on 'Adoption of Rapid Ethical Appraisal to Biomedical Research Projects in Ethiopia, **2009**, Brighton and Sussex, UK (£ 96,939)
2. Preliminary Research Network Grant on Female Reproductive Organ Cancer Network (AfroCANN), German Africa Cooperation, **2013**, Germany (60,000 Euro) BMBF
3. Group Research Grant on Pneumonia in Ethiopia, Swedish Research Council, **2014**, Sweden (78,000 Euro)
4. IMPACT grant from TDR/WHO, **2014**, WHO (50,000 USD)
5. DAAD Exchange Program **2016-2019** (PAGEL) (363,000 Euro)
6. Capacity Building for Cancer Research at AAU, American Cancer Society, Phase I (**2015-2016**) (30,000 USD)

V. SCIENTIFIC AND ACADEMIC PRESENTATIONS (RECENT)

Developing Biomedical Ethics for Addressing Global Health, RSTMH Biennial Meeting, Liverpool University, Liverpool, UK, 8-10, September 2010

Rapid Ethical Appraisal as a practical method for addressing ethical issues relating to biomedical research projects in Ethiopia. Research Seminar, Institute of Tropical Medicine, Antwerp, Belgium, May 2012

Ethical Issues in Conducting Research in Developing Countries - Role of REA, Scientific Writing Workshop, Martin Luther University, Germany, December 2012

Rapid Ethical Assessment. Ethiopian Medical Association CME Update on Medical Ethics and Health Research Ethics, Ghion Hotel, Addis Ababa, Ethiopia, February 8, 2013

Perceived Relevance of 'Rapid Ethical Assessment' (REA) for Medical Research in Ethiopia – Researchers' View. Ethiopian Medical Association 49th Annual Conference, Feb 22, 2013, AU Conference Center, Addis Ababa, Ethiopia

Adoption of Rapid Ethical Appraisal Adoption of 'Rapid Ethical Appraisal' as a practical method for addressing ethical issues relating to biomedical research in Developing Countries - Ethiopia. UKZN/SARETI, South Africa, March 14, 2013

The Ethics of Evidence: Challenges related to Treatment in Low and Middle Income Countries; Annual Conference on Pharmaceutical and Global Health: Inequalities and Innovations in the 21st Century, University of Sussex, Brighton, UK, 19 July 2013

Rapid Ethical Assessment to Improve Informed Consent Processes in a Low-Income Setting, 12th World Bioethics Congress, Mexico City, 25 June, 2014

Interventional study on rapid ethical assessment and informed consent comprehension in a low income setting. Royal Society of Tropical Medicine & Hygiene conference, Oxford, UK, September 27, 2014

A tool to address context specific ethical issues in low-income settings: the 'rapid ethical assessment', ITM Colloquium, Belgium, 24-27, November, 2014

VI. TRAININGS ATTENDED (RECENT)

1. Research Ethics on Reviewing Vulnerability, March 2011, Addis Ababa, Ethiopia
2. The Pan African Bioethics Initiative Conference, March 2011, Addis Ababa.
3. Training workshop on NVivo 9, September 5-6, 2011, Data Solutions Services, London.
4. Short Course on Research Methods, December 2011, ITM, Antwerpen, Belgium.
5. Research Ethics and IRB Training, December 2011, Addis Ababa, Ethiopia.
6. Qualitative and Mixed Methods in Health Research, May 2012, ITM, Belgium.
7. Scientific Writing Workshop, December 2012, MLU, Hale, Germany.
8. Updates in Medical and Research Ethics, February 7-8, 2013, Addis Ababa, Ethiopia.
9. Doing Research in Bioethics: Challenges amd Methodology, May 2013, Uppsala, Sweden.
10. The Dynamics of Consent in the Project CHRIS", May 2013, Uppsala, Sweden.
11. NVivo Intermediate/Advanced Workshop, June 2013, University of Surrey, UK.
12. Ethical Problems in Global Health Research, University of Sussex, June 2013, UK.
13. Preparing to complete your Doctorate, University of Sussex, June 2013, UK.
14. Publishing Research in Humanities and Social Sciences", June 2013, Brighton, UK.
15. 'Peer Review: The Nuts and Bolts A sense About Science Workshop', June 2013, University of Sussex.
16. H3Africa meeting Ethics Consultations, May 2014, Cape Town, South Africa.

VII. SCIENTIFIC ASSOCIATION'S MEMBERSHIPS

1. Ethiopian Public Health Association: Full member since 2000
2. Ethiopian Medical Association: Full member since 2004
3. Ethiopian Health Informatics Association: Founding member since 2006
4. International Society of Medical Decision Making since 2012
5. International AIDS Society since 2012
6. Royal Society of Tropical Medicine and Hygiene since 2014
7. International Bioethics Association since 2014

VIII. JOURANL REVIEWS: Peer-reviewed articles for

1. Ethiopian Medical Journal, Ethiopia
2. Ethiopian Journal of Health and Development, Ethiopia
3. Biomed Central, UK
4. Journal of Gender and Religion in Africa, South Africa
5. Bulletin of World Health Organization, WHO