Addis Ababa University

College of Health Sciences

School of Public Health

The association of intimate partner violence during pregnancy with preterm birth in Addis Ababa, Ethiopia

By

Genet Melak Alamene (BSc.)

A thesis submitted to the School of Public Health, College of Health Sciences, Adcdis Ababa University in partial fulfilment of the requirements for the degree of Master of Public Health in Reproductive and Family Health

November 2019

Addis Ababa, Ethiopia

The association of intimate partner violence during pregnancy with preterm birth in Addis Ababa, Ethiopia

By

Genet Melak Alamene (BSc.)

Advisors

Dr Mulugeta Betre Gebremariam (MD, MPH)

Abiy Seifu (MPH/RH)

Advisors' Approval Sheet

This is to verify that the thesis entitled as "The association of intimate partner violence during pregnancy with preterm birth in Addis Ababa, Ethiopia" is submitted in partial fulfillment of the requirements for the degree of masters of public health with specialty in "Reproductive and Family Health" to the Graduate Program of the School of Public Health in Addis Ababa University and has been carried out by Genet Melak under our supervision.

The student has fulfilled the thesis requirements and hence here by can submit the thesis to the school.

Name of advisors

Dr Mulugeta Betre Gebremariam (MD, MPH) Date: / /2019 Signature: ______

Abiy Seifu (BSc, MPH) Date: / /2019 Signature: ______

Examiners' Approval Sheet

We, the undersigned, members of the Board of Examiners of the final open defense by Genet Melak Alamene have read and evaluated her thesis entitled **"The association of intimate partner violence during pregnancy with preterm birth in Addis Ababa, Ethiopia."** This is to verify that the thesis has been accepted in partial fulfillment of the requirements for the Masters of Public Health degree in "Reproductive and Family Health"

Name of Internal Examiner:

______________________________ Date: / /2019 Signature ____________

Name of External Examiner:

______________________________ Date: / /2019 Signature ____________

Acknowledgments

I am grateful to Addis Ababa University, College of Health Sciences, School of Public Health and UNFPA for their financial support to undertake this thesis. I would also like to extend my appreciation to Addis Ababa Health Bureau for providing me the necessary information and facilitating conditions while I was carrying out this study.

My special gratitude goes to my advisors Dr Mulugeta Betre Gebremariam and Abiy Seifu for their unreserved support and guidance throughout this thesis preparation.

I would also like to thank all the interviewers and supervisors for their unreserved commitment during data collection. My gratitude goes to all of the study participants for their willingness and participation in the interview.

Finally, I would like to express my heartfelt gratitude to my family and friends for their all rounded-support during my entire study.

Acronyms

AAU	Addis Ababa University
AIDS	Acquired immunodeficiency syndrome
ANC	Antenatal Care
AOR	Adjusted Odds Ratio
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval
COR	Crude odds ratio
HIV	Human Immunodeficiency Virus
IPV	Intimate Partner Violence
LBW	Low Birth Weight
LNMP	Last Normal Menstrual Period
OR	Odds Ratio
PROM	Premature Rupture of Membrane
PSV	Psychological Violence
PTB	Preterm Birth
SPSS	Statistical Package for the Social Sciences
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections
UN	United Nation
WHO	World Health Organization

Table of Contents

Examiners' Approval Sheet II

Acknowledgments III

Acronyms IV

List of figures VIII

List of tables IX

Abstract X

1. Introduction 1

 1.1. Background 1
 1.2. Statement of the problem 3

2. Literature review 7

 2.1. Intimate partner violence during pregnancy 7
 2.2. Socio-demographic characteristics of women 9
 2.3. Obstetric characteristics of women 9
 2.4. Maternal medical history 10
 2.5. Maternal health service utilization 10
 2.6. Women's substance use 10
 2.7. Husbands'/partners' substance use 11
 2.8. Exposure to smoke inside the house 11
 2.9. Conceptual framework 12

3. Hypotheses 13

4. Objective 14

 4.1. General objective 14
 4.2. Specific objective 14

5. Methods 15

 5.1. Study area and period 15

5.2. Study design ... 15
5.3. Population ... 16
5.3.1. Source population ... 16
5.3.2. Study population ... 16
5.3.3. Inclusion criteria ... 16
5.3.4. Exclusion criteria for cases ... 16
5.3.5. Exclusion criteria for controls ... 16
5.4. Sample size calculation and sampling procedure ... 17
5.4.1. Sample size ... 17
5.4.2. Sampling procedure ... 17
5.5. Study variables ... 19
5.5.1. Dependent variable ... 19
5.5.2. Independent variables ... 19
5.6. Operational definition ... 20
5.7. Data collection tool and method ... 21
5.8. Data quality management ... 21
5.9. Data analysis and presentation ... 22
5.10. Ethical consideration ... 22
6. Results ... 24
6.1. Sociodemographic characteristics of the study participants ... 24
6.2. Obstetrics characteristics of the study participants ... 27
6.3. Maternal health service utilization ... 29
6.4. Medical history of the study participants ... 30
6.5. Behavioral characteristics of the study participants ... 31
6.6. Behavioral characteristics of respondents' husbands/partners ... 33
6.7. Exposure to smoke inside the house ... 34
6.8. Magnitude of intimate partner violence among cases and controls ... 35
6.9. Frequency of exposure to intimate partner violence during pregnancy ... 36
6.10. Factors associated with preterm birth ... 37
7. Discussion ... 40

8. Strength and limitation of the present study 44

8.1. Strength of the study 44

8.2. Limitation of the study 44

9. Conclusion 44

10. Recommendation 45

11. Reference 46

12. Annex 54

12.1 English version consent and questionnaire 54

12.1.1. Consent Form *54*

12.1.2. English language questionnaire *55*

12.2. የአማርኛ ቋንቋ የስምምነት ማስገንዘቢያ ቅጽና መጠይቅ 65

12.2.1. የስምምነት ማስገንዘቢያ ቅጽ *65*

12.2.2. የአማርኛ ቋንቋ መጠይቅ *66*

List of figures

Figure 1. Conceptual framework for the study on the association of intimate partner violence during pregnancy with preterm birth after reviewing the relevant literature. 12
Figure 2**:** Schematic presentation of the sampling procedure 18
Figure 3**:** Frequency of antenatal care follow up among cases and controls in Addis Ababa, Ethiopia, 2019 29
Figure 4: Medical history of the study participants in their recent pregnancy in selected public hospitals of Addis Ababa, Ethiopia, 2019 30
Figure 5**:** Respondents' exposure to smoke inside their house in Addis Ababa, Ethiopia, 2019 34
Figure 6: Magnitude of intimate partner violence during pregnancy among women in Addis Ababa, Ethiopia, 2019.. 35

List of tables

Table 1: Socio-demographic characteristics of the study participants in selected public hospitals of Addis Ababa, Ethiopia, 2019 25

Table 2: Obstetrics characteristics of the study participants in selected public hospitals of Addis Ababa, Ethiopia, 2019 27

Table 3: Behavioral characteristics of the study participants in their recent pregnancy in selected public hospitals of Addis Ababa, Ethiopia, 2019 31

Table 4: Behavioral characteristics of the respondents' partners/husbands in Addis Ababa, Ethiopia, 2019 33

Table 5: Frequency of exposure to intimate partner violence during pregnancy among study participants in Addis Ababa, Ethiopia, 2019 36

Table 6: Conditional multivariable logistic regression analysis of factors associated with preterm birth among women in public hospitals of Addis Ababa, Ethiopia, 2019. 38

Abstract

Background: Preterm birth is a significant and growing public health problem leading to increased neonatal morbidity and mortality. Intimate partner violence during pregnancy is one of the factors that affect not only women's health but also the health of the newborn. However, the association between intimate partner violence during pregnancy and preterm birth was not adequately studied in Ethiopia.

Objective: To assess the association between intimate partner violence during pregnancy and preterm birth in Addis Ababa, Ethiopia.

Methods: A facility-based age-matched case-control study was conducted among 420 women [140 cases (women who had preterm births) and 280 controls (women who had term births)] in six public hospitals in Addis Ababa, Ethiopia. Data was collected using a structured, interviewer-administered questionnaire. A woman who reported the experience of at least one act of violent act, either physical or sexual or emotional or controlling behaviours by an intimate partner during the index pregnancy period was considered exposed to intimate partner violence during pregnancy. Descriptive statistics were computed to describe the characteristics of study participants. Additionally, the association between intimate partner violence during pregnancy and preterm birth was analyzed using multivariable conditional logistics regression model. Statistical significance was declared at $P<0.05$. The analysis was performed using Stata 14.0.

Results: The odds of preterm birth was four times higher among women who experienced physical violence (AOR: 3.98, 95% CI: 1.03, 15.32), three times higher among women who experienced emotional violence (AOR: 3.64, 95% CI: 1.01, 13.06) and four times higher among women who reported controlling behaviors of their husbands/partners (AOR: 4.32, 95% CI: 1.10, 16.89) during their pregnancy.

Conclusion and recommendation: The study identified that women who experienced physical and emotional violence and whose husbands/partners demonstrated controlling behavior during pregnancy have a higher risk of preterm birth. To reduce the risk of preterm birth, prevention of physical and emotional violence during pregnancy and improving women's autonomy should be integrated into perinatal care interventions.

Keywords: Preterm birth, Intimate partner violence, Pregnancy, Addis Ababa, Ethiopia

1. Introduction

1.1. Background

Preterm birth is defined as the occurrence of any birth before 37 completed weeks of gestation, or fewer than 259 days since the first day of the woman's last normal menstrual period (LNMP). On the basis of the gestational age, it is further subdivided in to extremely preterm (if it is <28 weeks), very preterm (28 to <32 weeks); moderate or late preterm (32 to $<36^{+6/7}$ weeks of gestation) (1).

Every year, 2.6 million babies die before turning one month old. One million of them take their first and last breaths on the day they are born (2). Preterm birth complication contributes to 16% newborn death (3). Additionally, the 2016 World Health Organization (WHO) report showed that the leading causes of death among children under five death were preterm birth complications followed by acute respiratory infections, intrapartum-related complications, congenital anomalies and diarrhea (4).

Sub-Saharan Africa and South Asia contributed over 60% of preterm births worldwide. In Ethiopia, an estimated 320,000 birth each year (10% of births) and 23,100 children aged under-five year die due to the direct complication of preterm birth (5). Estimates of preterm births from facility-based studies in Ethiopia ranges from 4.4% in Gondar (6) to 25.9% in Jimma (7). On top of this, the World Vision Ethiopia reported that preterm birth is a direct contributing factor for 28% of newborn deaths in Ethiopia (8).

Among many, intimate partner violence (IPV) during pregnancy is one of the factors that may lead to poor birth outcomes through direct physical effects, the impact on mental health and behavioral changes (9). As an illustration, physical abuse that results in abdominal trauma can lead to premature labuor, rupture of membranes, placental abruption, and ruptured uterus, all of which lead to preterm birth or even fetal demise (10-12). Besides, it may exacerbate chronic problems such as hypertension and gestational diabetes, both of which have implications on newborn outcomes (12). Furthermore, it results in urinary tract infections, Human Immunodeficiency Virus (HIV) and other sexually transmitted diseases (STDs) (13, 14), placing them at increased risk for intrauterine growth restriction and preterm birth (15).

IPV is a global health issue that affects mostly women (and some men) from different backgrounds and social groups (16). It is one of the most common forms of violence against women and includes physical, sexual, and emotional abuse and controlling behaviors by an intimate partner (17).

In many cultures, IPV is socially accepted, may not always be considered as a criminal act or even incorrect, and the woman is seen as subservient to their male partner (18). Women of child-bearing age are at the highest risk for IPV, and pregnancy may represent a period of unique vulnerability to intimate partner violence because of changes in women's physical, social, emotional, and financial needs (19).

The prevalence of IPV during pregnancy in Africa ranges from 2% to 57% (20). The estimates of IPV during pregnancy in Ethiopia also vary. A study conducted in rural Ethiopia reported 77% of pregnant women had experienced physical violence. Of which, 28% had been punched or kicked on the abdomen (21). A facility-based study from Addis Ababa reported 33.9% of pregnant women experienced physical violence while 41.1% of pregnant women experienced sexual violence by their partner (22). Furthermore, a study done in Bale zone, Oromia region reported that 25.8% of women experienced violence during their pregnancy by their intimate partner (23).

The WHO and other international organization put forwarded that in order to prevent preterm birth, it is essential to prevent pregnancy in adolescence, optimize pre-pregnancy weight, prevent unintended pregnancies, promote optimal birth spacing, promote healthy nutrition, promote preconception care services for women with special risk factors that increase the risk for preterm birth, prevent and treat sexually transmitted infections (STIs), including HIV/AIDS, screen for, diagnose and manage chronic diseases, promote cessation of tobacco use and restrict exposure to second-hand smoke, and screen for, diagnose and manage mental health disorders and prevent intimate partner violence (1).

As Ethiopia's first initiative to prioritize programs to prevent preterm birth, Born On Time, a five-year project, was launched in 2016 to work in Amhara Region. The project was targeting risk factors relating to unhealthy lifestyles/behaviors (e.g. early marriage, gender-based violence, poor hygiene and sanitation, and excessive workloads during pregnancy), maternal infections

(e.g. syphilis, malaria), inadequate maternal nutrition and limited access to safe, reliable contraception (e.g. teenage pregnancy, birth spacing of less than 6 months) (8).

1.2. Statement of the problem

Preterm birth is a major cause of death and a significant cause of long-term loss of human potential amongst survivors all around the world (24). Some of the factors linked to preterm birth include medical conditions of the mother or fetus, genetic influences, environmental exposure, infertility treatments, behavioral and socioeconomic factors as well as iatrogenic prematurity (25).

Violence against women, committed by an intimate partner, is an important public health and human rights issue (26). Understanding the relationship between violence during pregnancy and adverse maternal and birth outcomes could have important clinical and public health implications (27).

However, identifying intimate partner violence (IPV) during pregnancy as one of the factors for preterm birth is not similar among different research findings. A study conducted in Iran found that compared to women who did not report physical, sexual and emotional violence, women who reported physical, sexual and emotional violence were more likely to deliver by cesarean, to have abnormal progress of labor, premature rupture of membranes, low birth weight, preterm birth and hospitalization before delivery (27). Additionally, the study from Peru found that compared with those reporting no exposure to IPV (physical and emotional IPV) during pregnancy, women reporting any exposure had a 2.1-fold increased risk of preterm birth (PTB) (28). Furthermore, a study done in Tanzania reported that women exposed to physical IPV were three times more likely to experience PTB and low birth weight (LBW) (29).

In contrast, the study conducted in Canada identified no statistically significant associations between exposure to violence and preterm birth (30). Similarly, a study done in Tanzania identified that, unlike physical violence, emotional and sexual violence have no statistically significant association with preterm birth (29). Additionally, the study conducted in Hossana town, Ethiopia found that intimate partner violence during pregnancy was not associated with stillbirth, preterm birth and low Apgar score (31).

Regarding the specific risk factors for preterm birth in Ethiopia, it was reported that solid fuel used for indoor cooking contributed 95%, hypertension in women (32%), anemia among women of childbearing age (17%), adult diabetes prevalence contribute (7%), birth interval <24 months (6%), obesity in women of childbearing age (6%), short stature among women of childbearing age (3%), adult HIV prevalence (1%), tobacco use amongst women (<1%), adolescent birth rate contributed for 80 preterm birth per 1,000 girls, and the report underlined the absence of data on the contribution of violence during pregnancy on preterm birth (5).

Recently, the WHO stated that all forms of interpersonal violence that lead to negative health outcomes should be addressed by the health system (32). On the other hand, a number of previous studies did not consider all forms of intimate partner violence to assess its effect on adverse pregnancy outcomes such as preterm birth. A study conducted in South Carolina (33), and Peru (28) only considered physical and emotional violence while the study in Vietnam (34), Brazil (35), Iran (27), Tanzania (29), Uganda (36) and Hossana town, Ethiopia (31) did not consider controlling behaviors of husband as part of intimate partner violence.

Moreover, a study conducted to assess factors associated with adverse birth outcomes (PTB and/or LBW) in Ethiopia such as in Addis Ababa (37), Gondar town (6), Mekele town (38), and Gamo Gofa Zone (39) did not consider IPV as one of the potential exposure variables.

It is known that preterm infants receive extensive medical care which often includes many invasive procedures such as mechanical ventilation and hyperoxia exposure. Additionally, it alters the rates of growth and maturation as the infant transitions to postnatal life (40).

Regarding the financial cost of IPV, the Centres for Disease Control and Prevention (CDC) reported that the costs of intimate partner rape, physical assault, and stalking exceed $5.8 billion each year, nearly $4.1 billion of which is for direct medical and mental health care services. The total costs of IPV also include nearly $0.9 billion in lost productivity from paid work and household chores for victims of nonfatal IPV and $0.9 billion in lifetime earnings lost by victims of IPV homicide. The largest proportion of the costs is derived from physical assault victimization because that type of IPV is the most prevalent. The largest component of IPV-related costs is health care, which accounts for more than two-thirds of the total costs (19).

Overall, the association between intimate partner violence during pregnancy and preterm birth has not been well understood in Ethiopia. Therefore, this study aimed to investigate the association between IPV during pregnancy and preterm birth, adjusting for covariates.

1.3. Rationale and significance of the study

Preterm births have devastating effects on the child's health and are the leading causes of death in children under-five years (41). In addition to its contribution to mortality, preterm birth has lifelong effects on neurodevelopmental functioning such as the increased risk of cerebral palsy, impaired learning, visual disorders, and an increased risk of chronic disease in adulthood (42). In spite of these, there are inconsistencies among research in reporting the association between IPV during pregnancy and PTB; where some studies (27-29, 34, 36, 43) reported the presence of statistically significant association whereas the other studies (19, 30, 31, 44, 45) reported the absence of statistically significant association between IPV during pregnancy and preterm birth. Additionally, a number of previous studies (28, 29, 31, 33-36) did not consider all forms of IPV during pregnancy. Furthermore, a number of previous studies conducted in Ethiopia (6, 37-39) did not consider IPV as one of the potential exposure variables to preterm birth. Therefore, assessing the association between IPV during pregnancy and preterm birth is needed to fill the information gap which is a vital task to make an informed decision by health professionals, program implementers, researchers, and policymakers.

Knowing whether IPV during pregnancy is associated with preterm birth or not is one of the important tasks for designing appropriate interventions to solve one of the major contributors to newborn morbidity and mortality. Hopefully, this study will provide pertinent information regarding the association between IPV during pregnancy and preterm birth to clinicians, educators, governmental and nongovernmental organizations (NGOs) that are working on maternal and child health issue, policymaker, and significant others; so that will help them make informed decision and take an appropriate action to solve the problem from its grass root.

2. Literature review

This section presents a literature that describes the association between the proposed exposure variable and preterm birth. Additionally, it tries to demonstrate the conceptual framework that pictorially shows the relation between the proposed exposure factors and PTB.

2.1. Intimate partner violence during pregnancy

Studies on the relationship between intimate partner violence during pregnancy and preterm birth have shown inconsistent findings.

A population-based case-control study conducted among women in Victoria, Australia found that IPV is associated with very preterm births. The odds of very preterm birth among women with emotional, harassment and physical violence were 2.25 (AOR: 2.25, 95% CI: 1.32, 3.84), 2.36 (AOR: 2.36, 95% CI: 1.08, 5.15), and 2.54 (AOR: 2.54, 95% CI: 1.43, 4.55) times higher when compared to women with no violence experience, respectively (46). However, the study did not consider the controlling behaviour of the husband as part of intimate partner violence. Additionally, the study participants were only women who had very preterm births (20 to less than 32 weeks) which may not represent women with all types of preterm birth.

A facility-based case-control study conducted among women who delivered live births in Lima, Peru found that the odds of preterm birth among women who experienced any type of IPV during pregnancy was 1.99 times (AOR: 1.99, 95% CI: 1.52, 2.61) higher than women who did not experience IPV. Specifically, emotional abuse was associated with a 1.6 fold (AOR: 1.6, 95 % CI: 1.21, 2.15) increased risk of PTB. Emotional and physical abuse together during pregnancy was associated with a 4.7 fold (AOR: 4.7, 95 % CI: 2.74, 7.92) increased risk of PTB (28). This study also did not consider sexual violence and controlling behavior of the husband as part of intimate partner violence.

A prospective cohort study conducted in Mulago hospital, Kampala, Uganda reported that the odds of preterm birth among pregnant women who were exposed to domestic violence were 1.45 times higher (AOR: 1.45, 95% CI: 1.08, 1.96) compared to women who did not (36). However, this study excluded women who had chronic diseases associated with frequent hospitalization and included those women living within 30 km radius from the hospital. Additionally, the controlling behavior of the husband was not included as part of intimate partner violence.

Another institution based cross-sectional study conducted among women who had attended postnatal care in Harare, Zimbabwe found that the odds of any recent negative birth outcome (LBW, premature baby, and cesarean section) was 1.38 times higher (AOR: 1.38: 95% CI: 1.03, 1.83) among women who exposed to emotional violence during pregnancy compared to women who did not exposed to emotional violence (47). Since the outcome variable was defined as any negative birth outcome (LBW, premature baby, and cesarean section), the explicit association between exposure to IPV during pregnancy and PTB from this study may not be clear.

A prospective study conducted in Dong Anh district, Vietnam also found that the odds of PTB among women who exposed for physical violence during pregnancy were five times higher than (AOR: 5.5, 95% CI: 2.1, 14.1) women who were not exposed to physical violence (34). The study did not include controlling behavior of the husband as a component of violence. It also did not assess the association between the overall violence (either of physical or sexual or emotional violence) during pregnancy with the risk of preterm birth.

A study conducted among women in Moshi, Tanzania found that women who exposed to physical IPV were three times more likely (AOR: 2.9, 95% CI: 1.3, 6.5) to experience PTB compared to women who had not exposed to physical violence (29). This study assessed women's exposure to emotional, sexual, and physical violence at 34 weeks gestation while the occurrence of preterm birth was determined 48 hours after delivery. Therefore, there could be the possibility of omitting violent acts that had happened after 34 weeks of pregnancy, which may result in under-reporting of the violence experienced.

Unlike the above-mentioned research finding, a number of research also reported that IPV did not have a statistically significant association with PTB. The study done using data from Maternity Experiences population-based Survey in Canada reported that there is no significant association between any abuse during pregnancy and the occurrence of preterm birth (30).

Likewise, a prospective cohort study performed in the city of Campinas, Brazil reported that there is no significant association (ARR: 0.95, 95% CI: 0.67, 1.33) between domestic violence perpetrated by partners and LBW or PTB (48). A similar study conducted in Baltimore, Maryland found that there is no significant association between IPV exposure during pregnancy (AOR: 2.15, 95% CI: 0.74, 6.24) and PTB (19).

A similar study conducted among women in Iran reported the absence of statistically significant association (AOR: 0.84, 95% CI: 0.61, 1.17) between PSV and pregnancy outcomes including PTB (44). Similarly, the study done using data from women attending prenatal care in the city of Sao Paulo, Brazil identified that there is no statistically significant association between physical, psychological and sexual violence, and PTB (45).

A facility-based cross-sectional study conducted among 183 recently delivered women in Hossana Town, South Nation's Nationalities Regional State of Ethiopia also reported that IPV during pregnancy did not have a statistically significant association with PTB (31).

2.2. Socio-demographic characteristics of women

A prospective longitudinal cohort study conducted in Tehran, Iran showed that income level, number of children, as well as mother's education, had an effect on preterm birth (43). A hospital-based cross-sectional study done in Nairobi, Kenya reported that maternal age (≥31 years) was one of the predictors of preterm birth (49).

A similar study conducted in Hosanna town found that being in the age group of less than 20 years and government employees were determinants of adverse birth outcomes (50). Additionally, an institution-based cross-sectional study conducted in Debremarkos town pointed out that low income (less than 600 birr) was the independent predictor of preterm birth (51). A similar study done in Jimma identified that women who attend their education up to Diploma and Degree level had 83% less likely to develop preterm birth when compared to those who had no educational background (illiterate mothers) (7). Furthermore, an institution based case-control study done in Gammogoffa zone reported that adverse birth outcome is 93.3% less likely among women who were student than housewife (39).

2.3. Obstetric characteristics of women

A case-control study conducted in Italy reported that a history of preterm birth was one of the factors associated with preterm birth (52). Similarly, a hospital-based cross-sectional study performed in Nairobi, Kenya found that history of preterm birth, history of abortion, and history of hypertension during pregnancy were the independent predictors of preterm birth (49).

A facility-based unmatched case-control study conducted in Jimma also reported that history of previous adverse birth outcomes (PTB, stillbirth, and LBW), history of preeclampsia, antepartum

hemorrhage, and birth interval less than 2 years were factors associated with preterm birth (53). Likewise, an institution based cross-sectional study done in Jimma found that history of abortion, history of stillbirth, history of bleeding during pregnancy, history of LBW, history of PTB and being multigravida were determinants of preterm birth (7). A similar study conducted in Gondar found that women having a history of either preterm delivery or small baby were more likely to have preterm births (54).

2.4. Maternal medical history

Infections during pregnancy can cross into the intra-amniotic cavity, establish intra-amniotic infection and result in preterm. In some women, such infections are associated with pre-labor rupture of the membranes which finally end up with preterm birth (1). A hospital-based cross-sectional study conducted in Nairobi, Kenya (49) and Jimma (7) found that urinary tract infection (UTI) during pregnancy have a statistically significant association with preterm birth. Besides, a hospital-based cross-sectional study conducted in Kenya also reported that a history of hypertension during pregnancy (HDP) (AOR: 2.04, 95% CI: 1.14, 3.64) was one of the factors associated with preterm birth(49). A similar study conducted in Addis Ababa (37) and Gondar (6) also reported that maternal HIV infection and hypertensive disorder of pregnancy have a statistically significant association with preterm birth.

2.5. Maternal health service utilization

Controlling the confounding effect of women's age, occupation, education, and place of residence, a facility-based cross-sectional study conducted in Hosanna town reported that lack of antenatal care was associated with adverse birth outcomes (PTB and LBW) (50). A similar study conducted in Debremarkos town also reported having antenatal follow up had a preventive effect for preterm birth (51). Another facility-based unmatched case-control study conducted Jimma also pointed out that antenatal care fewer than four visits is one of the determinants of preterm birth (53).

2.6. Women's substance use

Smoking cigarettes during pregnancy is one of the single most important avoidable causes of adverse pregnancy outcomes and it represents the first major environmental risk of the unborn (55). A prospective cohort study performed in the city of Campinas, Brazil reported that smoking

cigarettes during pregnancy is associated with low birth weight or prematurity (48). On the other hand, another hospital-based cross-sectional study conducted in Nairobi, Kenya reported that alcohol consumption during pregnancy was determined as significant risk factors for preterm birth (49). A similar study conducted in Jimma found that substance use during pregnancy has a statistically significant association with preterm birth (7).

2.7. Husbands'/partners' substance use

A case-control study conducted in Italy found that women's exposure to environmental tobacco smoke from husbands/partners or anyone else was associated with early preterm delivery (AOR: 1.71, 95% CI: 1.04, 2.89) (56). A meta-analysis finding also reported that maternal passive smoking at any place and home is associated with an increased risk of preterm birth (57).

2.8. Exposure to smoke inside the house

The association between preterm delivery and exposure to air pollutants has recently become a major concern. For instance, a nationwide study conducted in the Republic of Korea reported that maternal exposure to particulate matter during pregnancy was associated with an increased rate of preterm births (58). Additionally, another study conducted in the Republic of Korea showed that the presence of relatively low concentrations of air pollution based on air quality standards assessment during pregnancy contributed to an increased risk of preterm birth (59). There is a shortage of literature that shows the association of place of cooking, source of fuel used for cooking and indoor air pollution with birth outcomes such as preterm birth in Ethiopia. Even though previously conducted study in Bale zone, Oromia region, Ethiopia (60) found a statistically significant association between the presence of separate kitchen and source of energy used for cooking with the risk of low birth weight baby, their association with preterm birth was not studied very well in Ethiopia.

Generally, the above literature review demonstrated the presence of inconsistency in reporting the association between IPV during pregnancy and preterm birth. Moreover, it revealed the existence of the information gap regarding the association between IPV during pregnancy and the risk of preterm birth in Ethiopia. Therefore, this study was aimed to fill the above-mentioned information gap that is one of a very important task to make an informed decision by health professionals, program manager and policymakers. A conceptual framework that shows the

association between the above-mentioned proposed independent variables and PTB is presented in figure 1 in the next section.

2.9. Conceptual framework

The following conceptual framework (figure 1) demonstrates the relationship between the main exposure variable; IPV during pregnancy, and PTB. In addition to the main exposure variable of this study, it also reveals the range of factors that put women at risk of PTB or protect them from experiencing PTB.

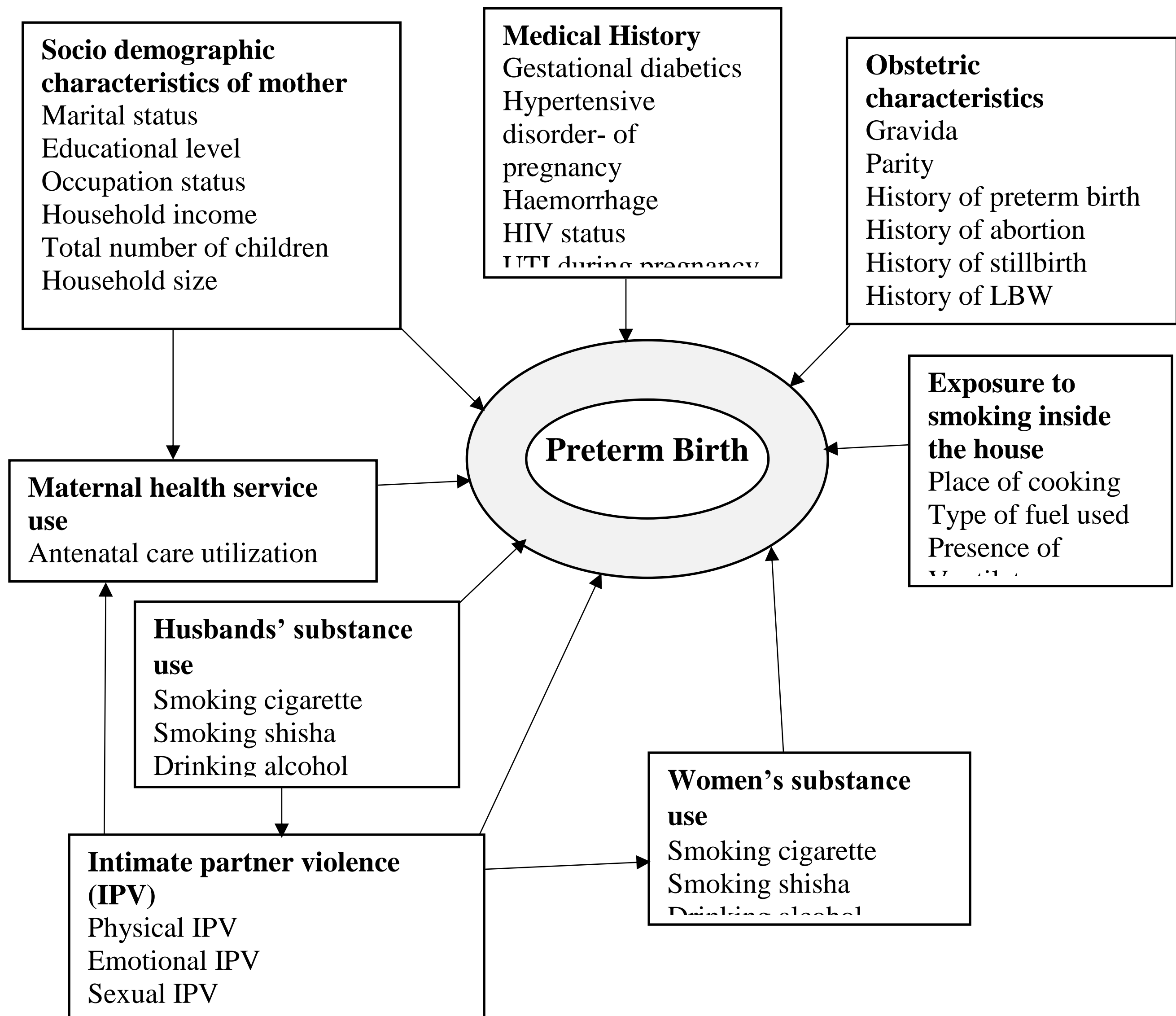


Figure 1. Conceptual framework for the study on the association of intimate partner violence during pregnancy with preterm birth after reviewing the relevant literature.

3. Hypotheses

Null hypothesis (Ho): preterm birth is not associated with intimate partner violence during pregnancy.

Alternative hypothesis (Ha): preterm birth is associated with intimate partner violence during pregnancy

4. Objective

4.1. General objective

To assess the association of intimate partner violence during pregnancy with preterm birth in Addis Ababa, Ethiopia, 2019.

4.2. Specific objective

To assess the association of intimate partner violence during pregnancy with preterm birth in Addis Ababa, Ethiopia, 2019.

5. Methods

5.1. Study area and period

The study was conducted in public hospitals found in Addis Ababa, Ethiopia. These were Saint Paul's Hospital Millennium Medical College, Gandhi Memorial General Hospital, Tikur Anbessa Specialized Hospital, Zewditu Memorial General Hospital, Yekatit 12 Medical College General Hospital, and Tirunesh Beijing Hospital. Addis Ababa is the capital city of Ethiopia covering about 540 km^2 and of which 18.2 km^2 are rural. Addis Ababa lies between 2,200 and 2,500 meters above sea level. It also lies at the foot of the 3,000 meters high Entoto Mountains. It is a city where, despite differences in number, almost all-ethnic groups live in (61). Addis Ababa has 10 Sub-Cities and 116 Weredas (62). The city hosts 30 percent of the urban population of Ethiopia. Its population has nearly doubled every decade (63). The 2017 projected population size of the city is estimated as 3,435,028. Of which, the proportion of female population accounts for 1,809,577 (52.68%) (64). There were 11 public hospitals and 62 health centres in Addis Ababa (65). Generally, the total number of hospitals run by the Ministry of Health and Private Entities in Addis Ababa was 39 (66).

The data was collected from March 20, 2019, to May 25, 2019.

5.2. Study design

A facility-based age-matched case-control study was employed on women with and without preterm birth who attended delivery services in the Public Hospital of Addis Ababa. Age was a matching variable in this study since there is variation in the risk of having preterm birth between different age groups. Women having birth at very early and late extreme age are at risk of experiencing preterm birth compared to other age groups (24, 25, 67). In our study, for every case included two controls were identified. Controls were matched with cases by age in a five-year age group.

Cases:- women who gave preterm birth (before 37 completed weeks of gestation (i.e $\leq 36^{+6/7}$ weeks) since her last normal menstrual period) but after 28 weeks of gestation were considered as a case.

Controls: - women who gave birth for term baby (37 completed weeks to $41^{+6/7}$ weeks of gestation) were considered in the study.

The selection of controls was made at each hospital from which cases were selected to control the influence of contextual variation.

5.3. Population

5.3.1. Source population

All women who were formally married or have a partner, and who attended delivery services in public hospitals of Addis Ababa were considered as source population.

5.3.2. Study population

Sampled women who fulfilled the following criteria of case and control were study population. Hence, cases were women who gave preterm birth (before 37 completed weeks of gestation ($\leq 36^{+6/7}$) since her last normal menstrual period) and control group was women who gave birth for term baby (37 completed weeks to $41^{+6/7}$ weeks of gestation) were considered in the study.

5.3.3. Inclusion criteria

All mothers selected as cases and controls were mothers with live and singleton births. The reason for considering singleton birth is that because multiple pregnancies are one of the major risk factors of preterm birth where 50% of twin pregnancies delivered before 37 weeks and 10% delivered before 32 weeks of gestation (68-70), including women with multiple pregnancies may not show the true association of IPV during pregnancy and preterm birth. Additionally, women who lived in Addis Ababa for at least 6 months were considered in this study.

5.3.4. Exclusion criteria for cases

Mothers of newborns who were seriously ill, who were unable to speak and hear, and mentally ill were used as exclusion criteria but we did not encounter such cases. Preterm births due to medical intervention (induced preterm birth) were excluded from the study.

5.3.5. Exclusion criteria for controls

Mothers of newborns who were seriously ill, women who unable to speak and hear, and mentally ill were not included in the study but we did not encounter such cases. Women who gave birth to the post-term baby were not considered in the study.

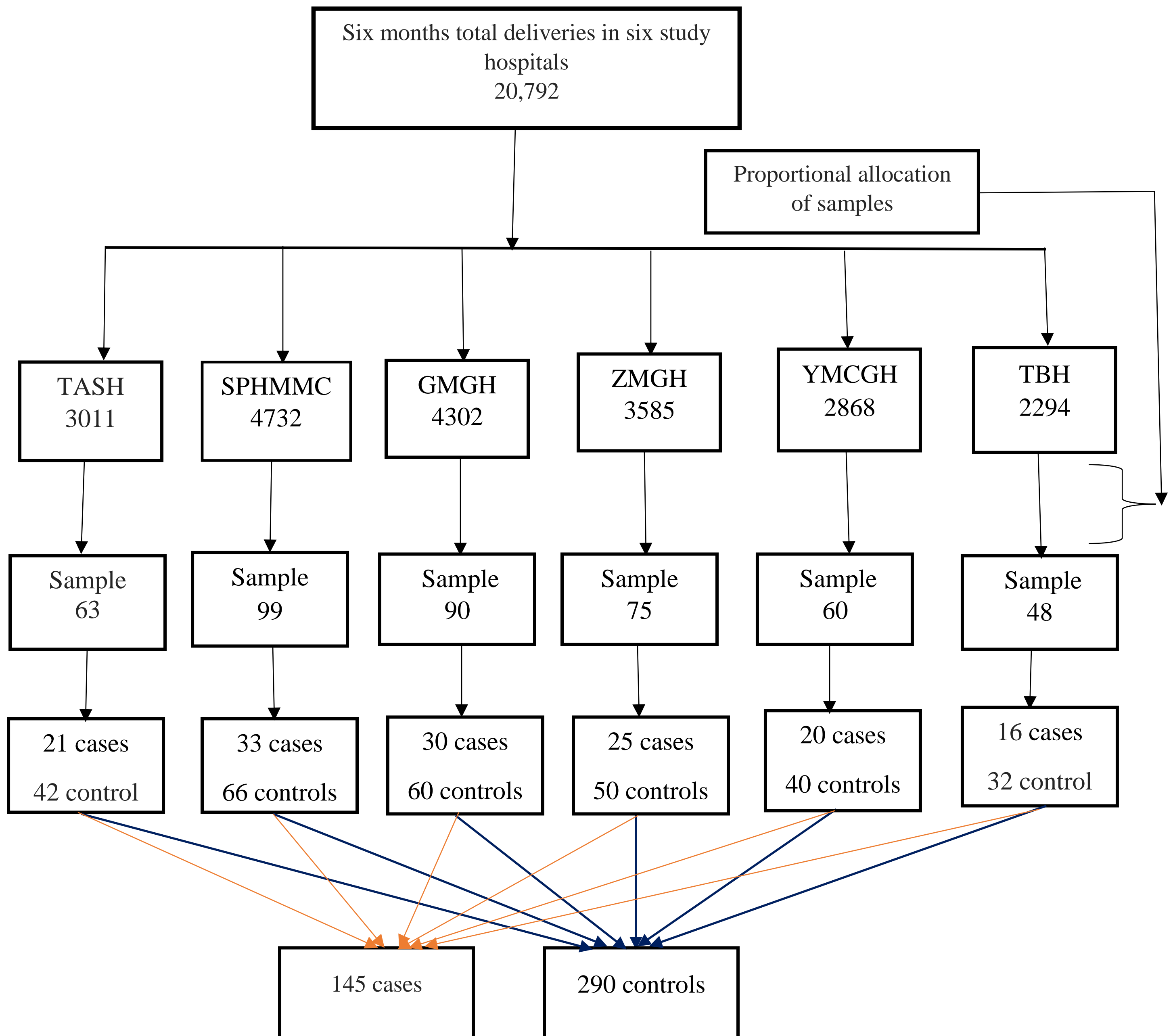
5.4. Sample size calculation and sampling procedure

5.4.1. Sample size

The sample size was determine using Epi Info 7.1 program with the following assumption: 95% significance level ($z_{\alpha/2}$ = 1.96), 80% power (z_{β} = 0.84), control to case ratio (r = 2), the least extreme odds ratio (OR) to be detected was 2 and 16.4% of controls exposed for IPV during pregnancy (23). Then, the sample size was 413 with 138 cases and 275 controls. When we add 5% contingency for non-respondents, the final and total sample size became 435 with 145 cases and 290 controls.

5.4.2. Sampling procedure

Out of 11 public hospitals found in Addis Ababa, 6 hospitals that have Neonatal Intensive Care Unit and a higher number of delivery caseloads were selected. Then, the sample was proportionally allocated to each hospital based on their previous six months total delivery service user. Women who came for delivery services in these health facilities, and diagnosed for preterm birth were identified as cases. Cases were selected after the physician made the diagnosis and this information was obtained from the client's medical record. Daily monitoring of all new deliveries in the study hospitals was made to identify study participants. After the case was identified, for each case, two consecutive controls based on matching criteria were included in the study. A consecutive sampling technique was applied to select the study participants. The schematic presentation of the sampling procedure is presented in figure 2 below. The cases and controls were matched based on age (in 5 years age group) within the same study hospitals. Since preterm is relatively a rare case and there was time constraint to get adequate sample size, all eligible cases fulfilling the inclusion criteria in each hospital were included in the study until the proportionally allocated sample size for each study hospital was satisfied within the study period.



TASH, *Tikur Anbessa Specialized Hospital*, SPHMMC, *Saint Paul's Hospital Millennium Medical College*; GMGH, *Gandhi Memorial General Hospital*; ZMGH, *Zewditu Memorial General Hospital*; YMCGH, *Yekatit 12 Medical College General Hospital* and TBH, *Tirunesh Beijing Hospital*

Figure 2**:** Schematic presentation of the sampling procedure

5.5. Study variables

5.5.1. Dependent variable

Preterm birth

5.5.2. Independent variables

The main independent variable

Intimate partner violence: Physical IPV, emotional IPV, sexual IPV and controlling behavior of the husband.

Other independent variables

Socio-demographic characteristics of women such as maternal age, marital status, educational level, occupation status, monthly income of the household, number of children and household size.

Obstetric characteristics: gravida, parity, history of abortion, history of preterm birth, history of LBW, history of stillbirth, planned pregnancy or not, and birth interval.

Medical history of women: gestational diabetics, hypertensive disorder of pregnancy, STIs, Urinary Tract Infection during pregnancy, hemorrhage and HIV Status.

Maternal health service utilization: Antenatal Care (ANC) utilization and frequency of ANC visit.

Women's substance use: Cigarette smoking, alcohol drinking, khat chewing, and shisha smoking.

Husbands'/partners' substance use: Cigarette smoking, alcohol drinking, khat chewing, and shisha smoking.

Exposure to smoke: a place of cooking, type of fuel used, presence of ventilating means in cooking place.

5.6. Operational definition

Intimate partner: since any woman who had been in a relationship with an intimate partner, whether or not they had been married, could have been exposed to the risk of violence, and partner in this study refers to legally married husband or in a common-law relationship whether cohabiting or not (17, 71).

Intimate partner violence: was assessed using the WHO tool used in a multi-country study on Women's Health and Domestic Violence against Women (71). But, in the present study, the assessment period of "12 months prior to interview" in the original tool was changed to "during this pregnancy". A woman who reported as she had experienced at least one act of violence (as described below), either physical or sexual or emotional or controlling behaviors by an intimate partner during the index pregnancy period, it was considered as the woman was exposed to IPV during pregnancy (71).

Physical violence was considered when a women experienced either of the following six violent acts: was slapped or had something thrown at her that could hurt her, was pushed or shoved, was hit with fist or something else that could hurt, was kicked, dragged or beaten up, was choked or burnt on purpose, or perpetrator threatened to use or actually used a gun, knife or other weapons against her during the index pregnancy (71).

Sexual violence was considered when a women experienced either of the following violent acts during the index pregnancy: was physically forced to have sexual intercourse when she did not want to, had sexual intercourse when she did not want to because she was afraid of what partner might do, was forced to do something sexual that she found degrading or humiliating (71).

Emotional violence: was assessed by asking the women if she experienced either of the following four violent acts during the index pregnancy: was insulted or made to feel bad about herself, was belittled or humiliated in front of other people, perpetrator had done things to scare or intimidate her on purpose, e.g. by the way he looked at her, by yelling or smashing things, perpetrator had threatened to hurt someone she cared about (71).

Controlling behaviours by an intimate partner: was considered when a women experienced either of the following seven violent acts during the index pregnancy: partner tried to keep her

from seeing friends, partner tried to restrict contact with her family of birth, partner insisted on knowing where she was at all times, partner ignored her and treated her indifferently, partner got angry if she spoke with another man, partner was often suspicious that she was unfaithful, partner expected her to ask permission before seeking health care for herself (71).

Preterm birth: a spontaneous live birth that occurs before 37 completed weeks (i.e. $<36^{+6/7}$) of gestation but after 28 weeks of gestation was considered as preterm (1, 72).

5.7. Data collection tool and method

A pre-tested and structured questionnaire that was developed after reviewing relevant literature (31, 34, 36, 39, 48, 71, 73) that address the objective of the study was used to collect data. The data was collected through face-to-face interviews after obtaining informed consent. Data were collected after the childbirth (at least, after four hours); provided that the women become stable and gained strength but prior to discharge from the hospitals. Gestational age was determined based on the last normal menstrual period (LNMP). When LNMP-based gestational age was unknown, the one obtained from ultrasound measurement was considered. Data regarding gestational age were collected from the women's medical record. Ten trained midwives collected the data. Three trained health professionals supervised the data collection process. The interview was made in private, in the absence of the partner/ other family members.

5.8. Data quality management

The quality of the data was assured by conducted a pre-test, translation of the questionnaire, and providing training for data collectors. Since the data collection tool was developed after reviewing different literature, it required a pretest on a population similar to the study participants. Therefore, the questionnaire was pretested on 36 respondents (12 cases and 24 controls) (74) in the study hospitals, Addis Ababa before the actual data collection period and necessary adjustments were made before using the tool for actual data collection. The researcher provided training to the data collectors and supervisors according to the WHO Guidelines presented in "Putting Women First: Ethical and safety recommendations for research on domestic violence against women" (75). The training was given for two days. It was focused on the study objective, data collection tool, sampling procedure, how to take consent and maintain privacy of the respondents. Additionally, supervisors were trained regarding how to supervise the

overall data collection process, and how to check consistency and completeness of the questionnaire. The researcher and supervisors randomly checked the collected data for completeness and then corrective measures were taken accordingly.

5.9. Data analysis and presentation

The data was checked for its completeness and consistencies, and then it was coded and entered into SPSS Version 23 *(IBM Corp. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp. 2015).* Data cleaning was done by running frequencies and cross tabulating with the main outcome variables. The magnitude of missing value was checked before the initiation of further analysis. Missing values were checked against the hard copies of the collected data to correct it accordingly. Then, it was exported to Stata 14.0 *(StataCorp. Stata Statistical Software: Released 14. College Station, TX: StataCorp LP. 2015)* for the analysis. The frequency of main dependent and independent variables was run and appropriate recoding was done to ease presentation. Descriptive statistics such as frequency, percentage, mean and standard deviation were computed to describe the characteristics of study subjects. Since the study design is a matched case-control study, matched analysis (conditional logistic regression analysis) was applied. The same five-year age groups were used as a matching variable. First, bivariate conditional logistic regression analysis was done to assess the association of each independent variable with the outcome. Then, those independent variables that have a statistically significant association with the outcome variable on bivariate analysis were included in the multivariable conditional logistic regression analysis. Multivariable conditional logistic regression was applied to control the effect of potential confounders. P-value < 0.05 on a bivariate conditional logistic regression was considered to select candidate variables for multivariable conditional logistic regression analysis as well as to declare statistically significant association. Odds ratios with its corresponding 95% confidence intervals (CI) were estimated. Multicollinearity between independent variables was checked. Finally, the result was presented using text, tables, and graphs.

5.10. Ethical consideration

The proposal was approved by the Research and Ethics Committee (REC) of School of Public Health, Addis Ababa University (AAU), Addis Ababa Health Bureau Ethics Commette and Saint Paul's Hospital Millennium Medical College Ethics Committee. On top of this, at each chosen

study site, the medical director/ chief executive director was contacted for permission and necessary information before the commencement of the study. Verbal consent was obtained from the study subjects after explaining the study objectives and procedures. Their right to refuse from participating in the study at any time they want was assured. For this purpose, a one-page consent letter was attached to each questionnaire stating about the general objective of the study, issues of confidentiality and safety procedure which was discussed by the data collectors before proceeding to data collection. During the clinical chart review, anonymity was ensured to maintain respondents' privacy. Additionally, all respondents were interviewed in private to maintain their privacy. Participation was on a voluntary basis, and no payment or other immediate benefit was offered to the participants. Before starting on particularly sensitive sections of the interview, participants were asked again whether they want to proceed and were reminded that they were free to terminate the interview or to skip any questions. Data collectors were trained to make a link with available counseling services if participants require the services.

6. Results

Out of 435 (145 cases and 290 controls) study participants approached, 5 cases refused to participate in the study and 10 controls were excluded from the study due to the absence of their corresponding cases. Therefore, a total of 420 (140 cases and 280 controls) age-matched postpartum women completed the interview yielding the overall response rate of 96.6%.

6.1. Sociodemographic characteristics of the study participants

The mean age (± standard deviation (SD)) of the study participants was 25.7 years (± 4.5) with a mean age of 25.5 (SD: ±4.6) for cases and 25.8 (SD: ± 4.4) for controls. The majority of cases, 78 (55.7%), and controls, 157 (56.1%), were Orthodox in their religion followed by Muslims. Fifty-five (39.3%) cases and 95 (33.9%) controls were Amhara in their ethnicity. Regarding marital status, most of the cases (81.4%) and controls (83.6%) were married. The highest education level for 77 (58.3%) cases was primary whereas 121 (46.7%) controls had attended to the secondary level. More than half of the respondents in cases and controls were housewives. The mean monthly household income of the study participants was 4461 (SD ± 2186) Ethiopian Birr (ETB). The proportion of household size less or equal to 5 for cases was 85.7% while it was 85.0% for controls. The detail of the socio-demographic characteristics of the study participants and their husbands/partners is presented in table 1 below.

Table 1**:** Socio-demographic characteristics of the study participants in selected public hospitals of Addis Ababa, Ethiopia, 2019

Variables	**Frequency**		**P-value**
	Controls *n* (%)	Cases *n* (%)	
Age (in years)			
15-19	14 (5.0)	7 (5.0)	1.00
20-24	110 (39.3)	55 (39.3)	
25-29	108 (38.6)	54 (38.6)	
30-34	34 (12.1)	17 (12.1)	
35-39	14 (5.0)	7 (5.0)	
Religion			
Orthodox	157 (56.1)	78 (55.7)	0.255
Muslim	101 (36.1)	45 (32.1)	
Protestant	20 (7.1)	17 (12.1)	
Any others*	2 (0.7)	0 (0.0)	
Ethnicity			
Amhara	95 (33.9)	55 (39.3)	0.001
Oromo	88 (31.4)	51 (36.4)	
Tigrae	22 (7.9)	10 (7.1)	
Gurage	61 (21.8)	11 (7.9)	
Any others**	14 (5.0)	13 (9.3)	
Marital status			
Formally married	234 (83.6)	114 (81.4)	0.583
Live together with a partner	46 (16.4)	26 (18.6)	
Women who attend formal education			
No	21 (7.5)	8 (5.7)	0.496
Yes	259 (92.5)	132 (94.3)	
Maternal educational level			
Primary	52 (20.1)	77 (58.3)	0.000
Secondary	121 (46.7)	28 (21.2)	
Technical/vocational	16 (6.2)	15 (11.4)	
Higher	70 (27.0)	12 (9.1)	
Maternal occupation			
Housewife	143 (51.1)	79 (56.4)	0.577
Government employee	35 (12.5)	12 (8.6)	
Private employee	49 (17.5)	22 (15.7)	
Any others ***	53 (18.9)	27 (19.3)	
Husband/partner who attend formal education			
No	14 (5.0)	10 (7.1)	0.372
Yes	266 (95.0)	130 (92.9)	

Table 1: Socio-demographic characteristics of the study participants in selected public hospitals of Addis Ababa, Ethiopia, 2019……………continued

Variables	Frequency		P-value
	Controls *n* (%)	Cases *n* (%)	
Education level of husband/partner			
Primary	68 (25.6)	45 (34.6)	0.069
Secondary	80 (30.1)	44 (33.9)	
Technical/vocational	14 (5.3)	7 (5.4)	
Higher	104 (39.1)	34 (26.1)	
Occupation of husband/partner			
Government employee	41 (14.6)	9 (6.4)	0.031
Private employee	124 (44.3)	68 (48.6)	
Merchant	70 (25.0)	28 (20.0)	
Daily laborer	27 (9.6)	22 (15.7)	
Any others****	18 (6.4)	13 (9.3)	
Average monthly income of the household			
<1500 birr	17 (6.3)	29 (20.9)	0.000
1500-2999 birr	28 (10.3)	21 (15.1)	
≥ 3000 birr	226 (83.4)	89 (64.0)	
Missing	9 (3.2)	1(0.7)	
Number of currently alive children			
1	136 (48.6)	76 (54.3)	0.270
>=2	144 (51.4)	64 (45.7)	
Household size			
<=5	238 (85.0)	120 (85.7)	0.846
>6	42 (15.0)	20 (14.3)	

*Any others include Catholic and Jehovah

**Any others include Wolayita, Silte, and Gamo

***Any others include students, merchants, and waiter.

****Any others include driver, daily laborer, mechanic, and carpenter.

6.2. Obstetrics characteristics of the study participants

Of the total 140 cases and 290 controls, 75 (53.6%) cases, and 162 (57.9%) controls were multigravida. A comparable proportion of cases (37.0%) and controls (38.9%) had a history of abortion. Similarly, for 80.7% of cases and 81.8% controls, their index pregnancy was planned. Seventy-four (52.9%) cases were primipara while 143 (51.1%) controls were multipara. A comparable proportion of cases and controls (37.9% and 37.1%, respectively) had a short birth interval. A slightly higher proportion of controls (15.2%) had a history of stillbirth compared to the cases (7.6%). Six (9.1%) cases and 13 (8.6%) controls reported history of preterm birth and low birth weight babies in their previous pregnancy (Table 2).

Table 2**:** Obstetrics characteristics of the study participants in selected public hospitals of Addis Ababa, Ethiopia, 2019

Variables	**Frequency**		**P-value**
	Controls *n* (%)	Cases *n* (%)	
Gravida (number of pregnancy)			
Primigravida (1)	100 (35.7)	59 (42.1)	0.355
Multigravida (2-4)	162 (57.9)	75 (53.6)	
Grandmultigravida (>=5)	18 (6.4)	6 (4.3)	
History of abortion			
No	110 (61.1)	51 (63.0)	0.776
Yes	70 (38.9)	30 (37.0)	
Number of abortion			
None	110 (61.1)	51 (63.0)	
1	54 (30.0)	22 (27.1)	0.885
>=2	16 (8.9)	8 (9.9)	
Pregnancy planned			
No	51 (18.2)	27 (19.3)	0.790
Yes	229 (81.8)	113 (80.7)	
Parity (number of birth)			
Primipara (1)	129 (46.1)	74 (52.9)	0.327
Multipara (2-4)	143 (51.1)	64 (45.7)	
Grandmultipara (>=5)	8 (2.8)	2 (1.4)	
Birth interval			
Short birth interval (<33 months)	56 (37.1)	25 (37.9)	0.912
Non-short birth interval (>=33 months)	95 (62.9)	41 (62.1)	
History of stillbirth			
No	128 (84.8)	61 (92.4)	0.122
Yes	23 (15.2)	5 (7.6)	

Table 2: Obstetrics characteristics of the study participants in selected public hospitals of Addis Ababa, Ethiopia, 2019…continued

Variables	Frequency		P-value
	Controls *n* (%)	Cases *n* (%)	
Number of stillbirths			
None	128 (84.8)	61 (92.4)	0.234
1	20 (13.2)	5 (7.6)	
2	3 (2.0)	0 (0.0)	
History of preterm birth			
No	138 (91.4)	60 (90.9)	0.908
Yes	13 (8.6)	6 (9.1)	
Number of preterm birth			
None	138 (91.4)	60 (90.9)	0.908
1	13 (8.6)	6 (9.1)	
History of low birthweight			
No	138 (91.4)	60 (90.9)	0.908
Yes	13 (8.6)	6 (9.1)	
Number of low birthweights			
None	138 (91.4)	60 (90.9)	
1	13 (100.0)	6 (9.1)	0.908

6.3. Maternal health service utilization

Out of the total 140 cases, 14 (10.0%) did not have ANC, 97 (69.3%) of them started their first ANC at less than 16 weeks of gestation while 29 (20.7%) of cases started their first ANC visit after 16 weeks. Among 280 controls interviewed, 14 (5.0%) controls reported that they did not have ANC follow up during their recent pregnancy while 219 (78.2%) cases initiated their first ANC visit at less than 16 weeks of gestation and 47(16.8%) of them initiated after 16 weeks of gestation. Regarding the frequency of ANC visits, 46.4% of cases had made at least 4 ANC (Figure 3). Regarding Iron/Folate supplementation, 122 (96.8%) cases and 259 (97.4%) controls were given Iron/Folate during their ANC.

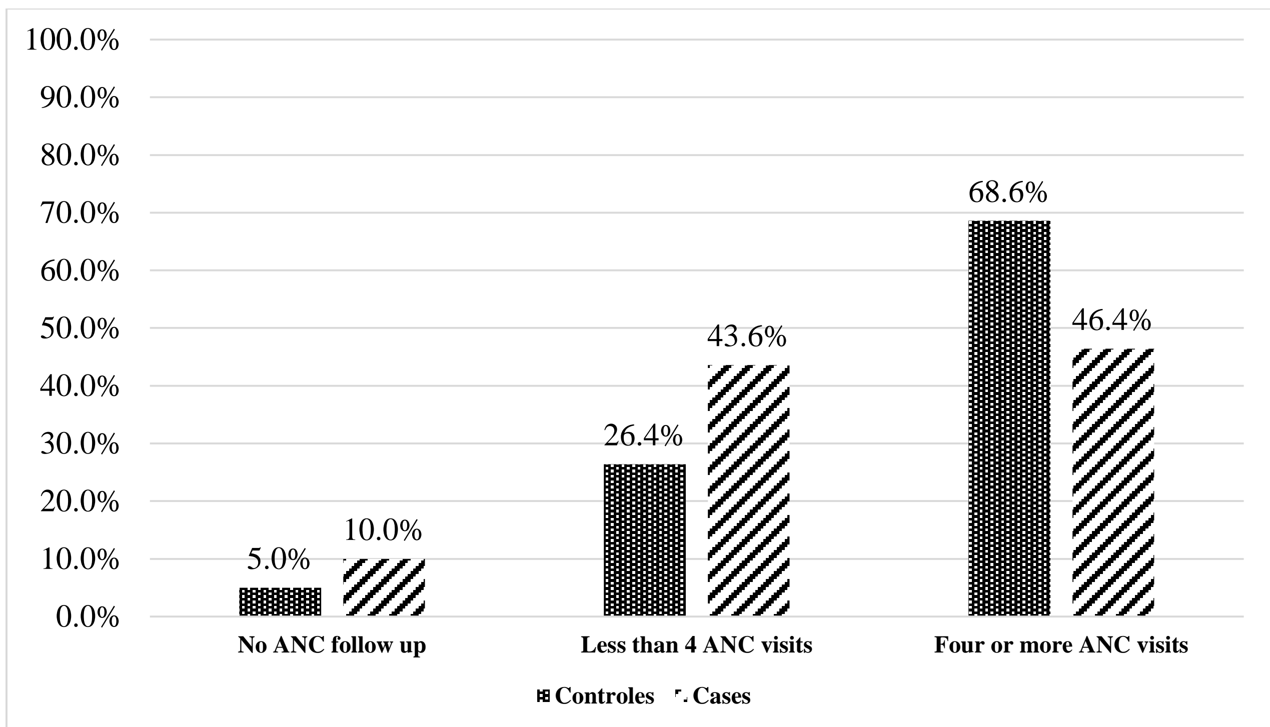


Figure 3: Frequency of antenatal care follow up among cases and controls in Addis Ababa, Ethiopia, 2019

6.4. Medical history of the study participants

Out of the total study participants, 5 (3.6%) cases and 10 (3.6%) controls reported to have diabetics during recent pregnancy. Forty-six (32.9%) cases and 24 (8.6%) controls have reported the occurrence of hypertensive disorder of pregnancy during their pregnancy. The magnitude of bleeding during pregnancy was reported by nearly a quarter of cases (24.3%) and 10.4% of controls. Urinary tract infection during recent pregnancy was reported by 13.6% of cases and 17.1% of controls. A comparable proportion of cases (97.1%) and controls (97.5%) were tested for HIV. Figure 4 bellow outlined the medical history of the study subjects.

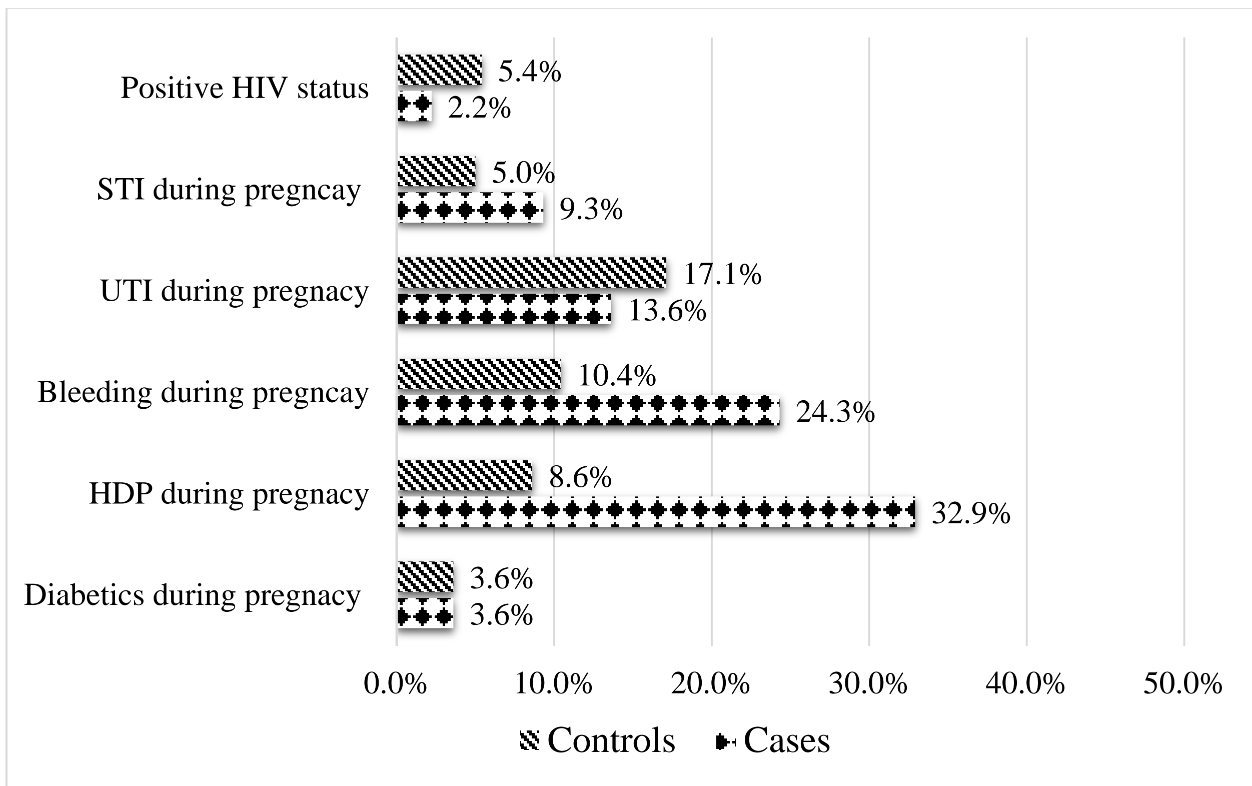


Figure 4: Medical history of the study participants in their recent pregnancy in selected public hospitals of Addis Ababa, Ethiopia, 2019

HIV, Human Immunodeficiency Virus; STI, Sexually Transmitted Infections; UTI, Urinary Tract Infection; HDP, Hypertensive disorder of pregnancy;

6.5. Behavioral characteristics of the study participants

Overall, 4 (2.9%) cases and 4 (1.4%) controls reported having ever-smoked cigarettes. Additionally, 3 (2.1%) cases and 4 (1.4%) controls smoked cigarettes during their recent pregnancy. Regarding shisha smoking, 3 (2.1%) cases and 3 (1.1%) controls reported that they ever smoked shisha. Similarly, 2(1.4%) cases and 3(1.1) controls reported that they smoked shisha during their recent pregnancy. Regarding alcohol drinking, 85 (60.7%) cases and 174 (62.1%) controls had ever drunk alcohol. a comparable proportion of cases (48.6%) and controls (48.6%) drank alcohol during their recent pregnancy. Sixteen (11.4%) cases and 25 (9.0%) controls reported that they had ever chewed khat, The proportion of khat chewing during pregnancy was 9.3% among cases and 7.5% among controls (Table 3).

Table 3**:** Behavioral characteristics of the study participants in their recent pregnancy in selected public hospitals of Addis Ababa, Ethiopia, 2019

Variables	**Frequency**		**P-value**
	Controls *n* (%)	Cases *n* (%)	
Ever smoked cigarettes			
No	276 (98.6)	136 (97.1)	0.313
Yes	4 (1.4)	4 (2.9)	
Smoked cigarette during pregnancy*			
No	276 (98.6)	137 (97.9)	0.59
Yes	4 (1.4)	3 (2.1)	
Frequency of smoking cigarette during pregnancy*			
Daily	3 (75.0)	1 (33.3)	0.257
Few times per week	1 (25.0)	0 (0.0)	
Rarely	0 (0.0)	2 (66.7)	
Average number of cigarette smoked per day*			
1	1 (25.0)	0 (0.0)	1.00
2	1 (25.0)	1 (100.0)	
3	2 (50.0)	0 (0.0)	
Ever smoked shisha			
No	277 (98.9)	137 (97.9)	0.383
Yes	3 (1.1)	3 (2.1)	
Smoked shisha during pregnancy*			
No	277 (98.9)	138 (98.6)	0.750
Yes	3 (1.1)	2 (1.4)	

Table 3: Behavioral characteristics of study participants in their recent pregnancy in selected public hospitals of Addis Ababa, Ethiopia, 2019…continued

Variables	Frequency		P-value
	Controls *n* (%)	Cases *n* (%)	
Frequency of smoking shisha during pregnancy			
Daily	2 (66.7)	0 (0.0)	0.200
Few times per week	1 (33.3)	0 (0.0)	
Rarely	0 (0.0)	2 (100.0)	
Ever drunk alcohol			
No	106 (37.9)	55 (39.3)	0.777
Yes	174 (62.1)	85 (60.7)	
Drank alcohol during pregnancy			
No	144 (51.4)	72 (51.4)	1.000
Yes	136 (48.6)	68 (48.6)	
Frequency of drinking alcohol during pregnancy			
Daily	6 (4.4)	4 (5.9)	0.898
Few times per week	40 (29.4)	20 (29.4)	
Rarely	90 (66.2)	44 (64.7)	
Ever chewed khat			
No	255 (91.0)	124 (88.6)	0.416
Yes	25 (9.0)	16 (11.4)	
Chewed khat during pregnancy			
No	259 (92.5)	127 (90.7)	0.527
Yes	21 (7.5)	13 (9.3)	
Frequency of chewing khat during pregnancy			
Daily	7 (33.3)	3 (23.0)	0.816
Few times per week	7 (33.3)	5 (38.5)	
Rarely	7 (33.3)	5 (38.5)	

6.6. Behavioral characteristics of respondents' husbands/partners

Forty-one (29.3%) cases and 19 (6.8%) controls reported that their husbands/partners currently smoked cigarettes. Similarly, 2.9% of cases and 1.0% of controls disclosed that their husbands/partners currently smoked shisha. A comparable proportion of cases (70.0%) and controls (72.5%) reported that their husbands/partners currently drank alcohol. About 22.9% of cases and 25.0% of controls reported that their partner chews khat at the time of the study (Table 4).

Table 4**:** Behavioral characteristics of the respondents' partners/husbands in Addis Ababa, Ethiopia, 2019

Variables	**Frequency**		**P-value**
	Controls *n* (%)	Cases *n* (%)	
Husband/partner cigarette smoking status			
No	261 (93.2)	99 (70.7)	0.000
Yes	19 (6.8)	41 (29.3)	
Frequency of smoking cigarette			
Daily	14 (73.7)	35 (85.4)	0.354
Few times per week	2 (10.5)	4 (9.8)	
Rarely	3 (15.8)	2 (4.8)	
Husband/partner shisha smoking status			
No	277 (99.0)	136 (97.1)	0.178
Yes	3 (1.0)	4 (2.9)	
Frequency of smoking shisha			
Daily	2 (66.7)	2 (50.0)	0.429
Few times per week	0 (0.0)	2 (50.0)	
Rarely	1 (33.3)	0 (0.0)	
Husband/partner alcohol drinking status			
No	77 (27.5)	42 (30.0)	0.592
Yes	203 (72.5)	98 (70.0)	
Frequency of drinking alcohol			
Daily	40 (19.7)	22 (22.4)	0.816
Few times per week	83 (40.9)	37 (37.8)	
Rarely	80 (39.4)	39 (39.8)	
Husband/partner khat chewing status			
No	210 (75.0)	108 (77.1)	0.629
Yes	70 (25.0)	32 (22.9)	
Frequency of chewing khat			
Daily	31 (44.3)	18 (56.2)	0.177
Few times per week	13 (18.6)	8 (25.0)	
Rarely	26 (37.1)	6 (18.8)	

6.7. Exposure to smoke inside the house

Of the total study participants, a majority (68.6%) of cases cooked their food in the house (i.e. living house) while 51.8% of controls cooked their food in a separate building (Figure 5). Regarding the presence of ventilator in cooking area, 22 (16.9%) cases reported the absence of window or mechanical apparatus in cooking area while window was reported by 104 (80.0%) cases and mechanical apparatus by 4 (3.1%) of them. Likewise, 50 women in controls group reported that they had no window or mechanical device in a place where they cook food while 108 (75.9%) and 10 (4.0%) controls reported the presence of window and mechanical apparatus, respectively.

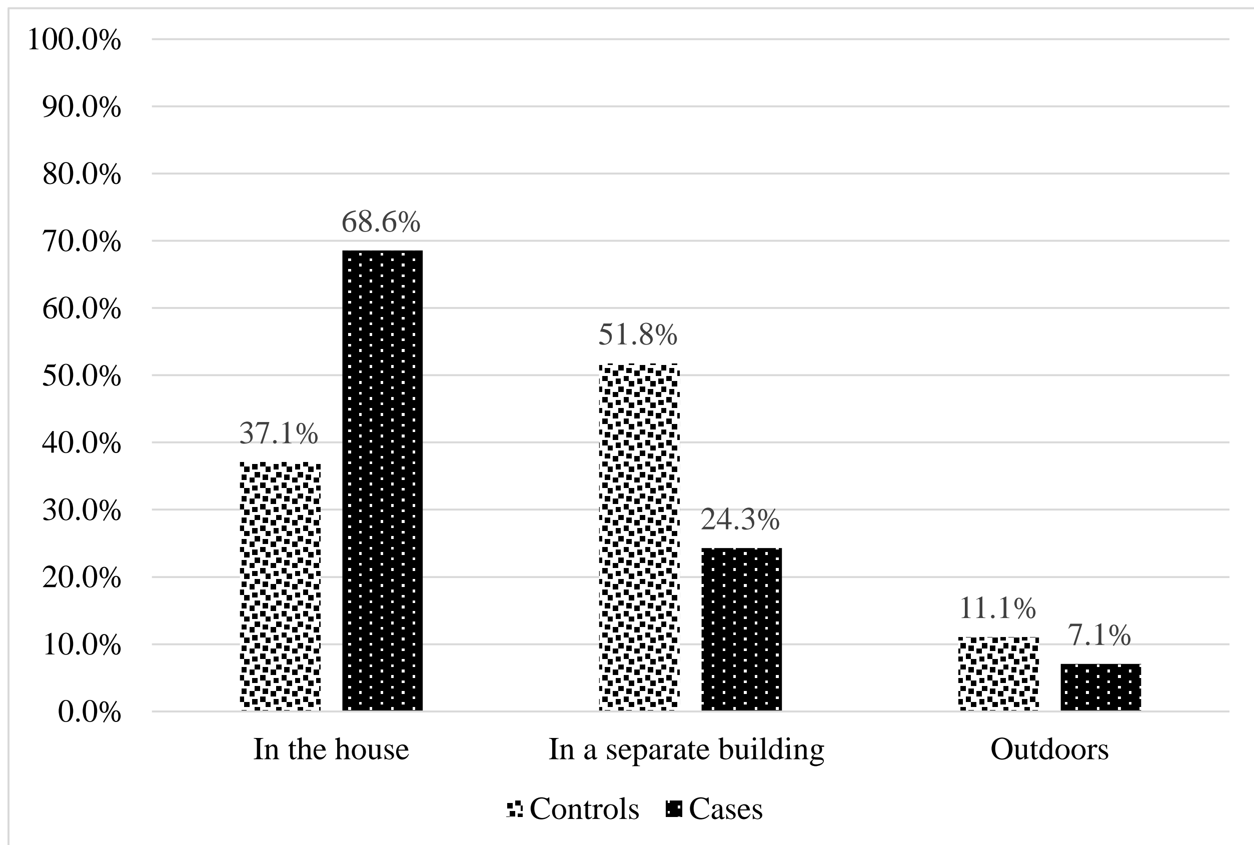


Figure 5: Respondents' exposure to smoke inside their house in Addis Ababa, Ethiopia, 2019

6.8. Magnitude of intimate partner violence among cases and controls

Figure 6 describes the magnitude of IPV during pregnancy among cases and controls. Out of the total 420 study participants included in the study, 112 (80.0%) cases and 126 (45.0%) controls experienced at least one form of IPV. Consistently, a higher proportion of cases experienced physical violence, sexual violence, emotional violence, and controlling behavior of husband, respectively (figure 6).

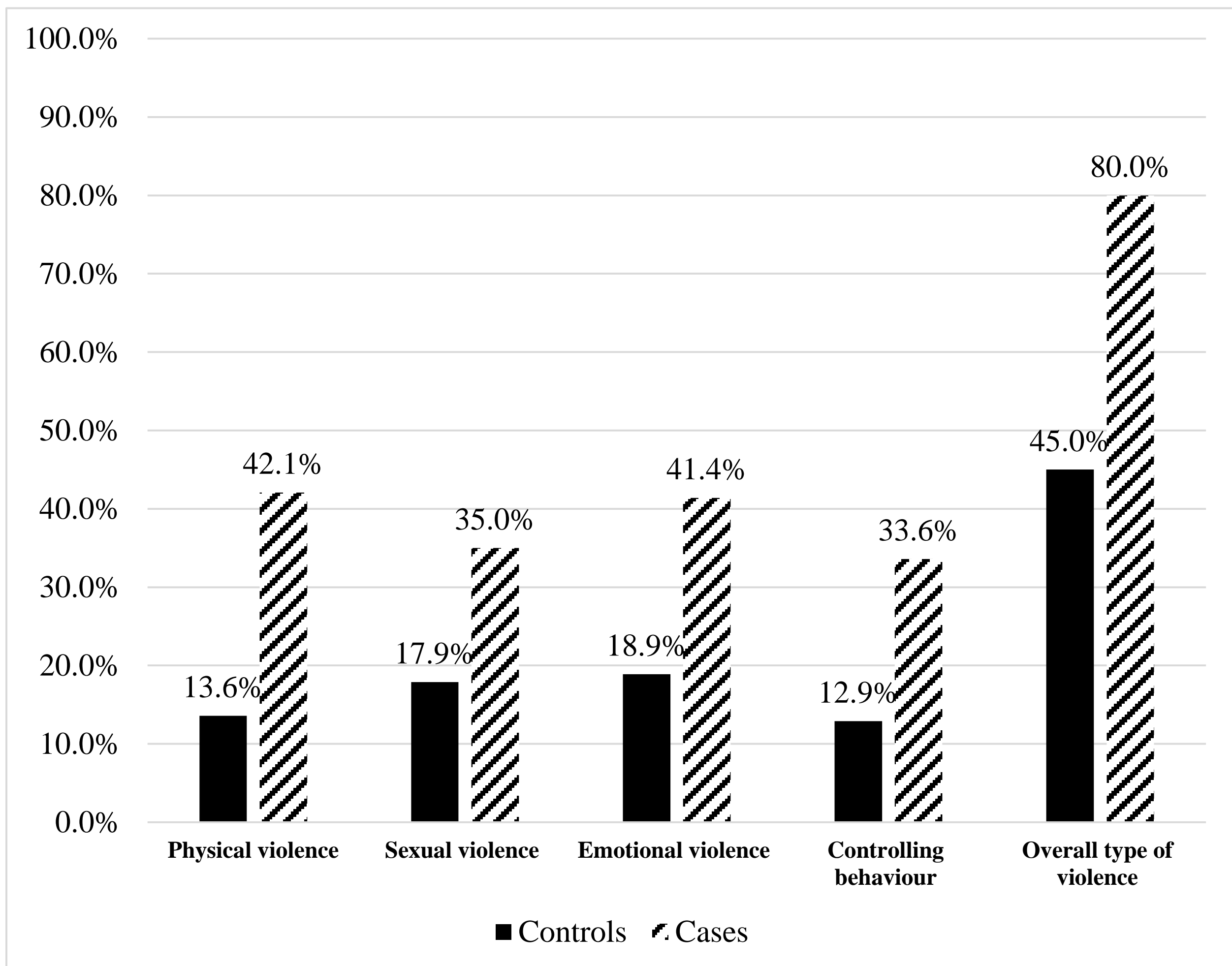


Figure 6: Magnitude of intimate partner violence during pregnancy among women in Addis Ababa, Ethiopia, 2019

6.9. Frequency of exposure to intimate partner violence during pregnancy

More than half of cases (55.9%) reported that they experienced physical violence few times while it is one time for half (50.0%) of controls. Similarly, high proportion of cases (44.9%) reported that they experienced sexual violence few times during their index pregnancy while 44.0% control reported the frequency was one time during their index pregnancy. The frequency of experiencing emotional violence for the majority of cases (55.2%) and controls (45.3) was few times during their index pregnancy. Likewise, majority of cases and controls experienced controlling behavior and the overall type of violence few times during their pregnancy (Table 5).

Table 5**:** Frequency of exposure to intimate partner violence during pregnancy among study participants in Addis Ababa, Ethiopia, 2019

Variables	**Frequency**		**P-value**
	Controls *n* (%)	Cases *n* (%)	
Frequency of physical violence			
One times	19 (50.0)	22 (37.3)	0.372
Few times	18 (47.4)	33 (55.9)	
Many times	1 (2.6)	4 (6.8)	
Frequency of sexual violence			
One times	22 (44.0)	12 (24.5)	0.098
Few times	19 (38.0)	22 (44.9)	
Many times	9 (18.0)	15 (30.6)	
Frequency of emotional violence			
One times	23 (43.4)	22 (37.9)	0.511
Few times	24 (45.3)	32 (55.2)	
Many times	6 (11.3)	4 (6.9)	
Frequency of controlling behavior			
One times	9 (25.0)	7 (14.9)	0.290
Few times	14 (38.9)	26 (55.3)	
Many times	13 (36.1)	14 (29.8)	
Overall type of violence			
One times	44 (35.0)	20 (17.9)	0.012
Few times	57 (45.2)	63 (56.2)	
Many times	25 (19.8)	29 (25.9)	

6.10. Factors associated with preterm birth

On bivariate conditional logistic regression analysis, maternal education, husband/partner education, occupation of the husband/partner, household average monthly income, hypertensive disorder of pregnancy, hemorrhage during pregnancy, frequency of ANC, place for cooking food, husband/partner cigarette smoking, physical violence, sexual violence, emotional violence, controlling behaviors, and overall type of violence have statistically significant association.

In multivariable conditional logistic regression analysis, after controlling for the potential confounding variables, maternal education, hypertensive disorder of pregnancy, frequency of ANC, husband/partner cigarette smoking, place for cooking food, physical violence, emotional violence, controlling behaviors of husband/partner were identified as the independent predictors of preterm birth (Table 6).

Multivariable conditional logistic regression showed that the odds of preterm birth was about 4 times higher (AOR: 3.98, 95% CI: 1.03, 15.32) among women who experienced physical violence during pregnancy by their partner compared with women who did not experience physical violence; by their partner; 3 times higher (AOR: 3.64, 95% CI: 1.01, 13.06) among women who experienced emotional violence compared to women who did not experience emotional violence; 4 times higher (AOR: 4.32, 95%CI: 1.10, 16.89) among women who reported controlling behaviours of their husbands/partners compared with women who did not report controlling behaviour of their husbands/partners.

In addition, the odds of preterm birth among women who attended primary education was 5 times higher (AOR: 5.03, 95% CI: 1.14, 22.18) compared to women who attended higher level of education; nearly five times higher (AOR: 4.87, 95% CI: 1.52, 15.56) among women with hypertensive disorder of pregnancy than women with no hypertensive disorder of pregnancy; 3 times (AOR: 3.05, 95% CI: 1.11, 8.37) higher among women who had less than 4 ANC visit compared to women who had four or more ANC visit; 6 times (AOR: 6.54, 95% CI: 1.49, 28.62) higher among women whose husbands/partners were cigarette smoker compared with women who had non-smoking husband/partner; 4 times (AOR: 4.59, 95% CI: 1.42, 14.8) higher among women who cooked in the house compared to women who cooked outdoor.

Table 6: Conditional multivariable logistic regression analysis of factors associated with preterm birth among women in public hospitals of Addis Ababa, Ethiopia, 2019.

Variables	Controls n (%)	Cases n (%)	COR (95% CI)	AOR (95% CI)
Maternal education				
Primary	52 (20.1)	77 (58.3)	7.97 (3.68, 17.29)***	5.03 (1.14, 22.18)**
Secondary	121 (46.7)	28 (21.2)	1.49 (0.68, 3.28)	0.68 (0.17, 2.66)
Technical/vocational	16 (6.2)	15 (11.4)	5.45 (1.99, 14.85)***	3.28 (0.53, 19.94)
Higher	70 (27.0)	12 (9.1)	Reference	Reference
Husband's/partner's education level				
Primary	68 (25.5)	45 (34.6)	2.09 (1.21, 3.60)***	0.26 (0.06, 1.16)
Secondary	80 (30.1)	44 (33.9)	1.67 (0.99, 2.84)	0.41 (0.12, 1.39)
Technical/vocational & Higher	118 (44.4)	41 (31.5)	Reference	Reference
Occupation of husband/partner				
Government employee	41 (14.6)	9 (6.4)	Reference	Reference
Private employee & other[a]	239 (85.4)	131 (93.6)	2.12 (1.00, 4.47)**	4.05 (0.63, 25.69)
Household average monthly income				
<1500 Ethiopian Birr	17 (6.3)	29 (20.9)	4.14 (2.10, 8.13)***	3.72 (0.72, 19.3)
1500-2999 Ethiopian Birr	28 (10.3)	21 (15.1)	2.22 (1.14, 4.32)**	0.46 (0.08,2.56)
>=3000 Ethiopian Birr	226 (83.4)	89 (64.0)	Reference	Reference
Hypertensive disorder during pregnancy				
No	256 (91.4)	94 (67.1)	Reference	Reference
Yes	24 (8.6)	46 (32.9)	5.11 (2.87, 9.08)***	4.87 (1.52, 15.56)***
Bleeding during pregnancy				
No	251 (89.6)	106 (75.7)	Reference	Reference
Yes	29 (10.4)	34 (24.3)	2.52 (1.49, 4.24)***	0.41 (0.09, 1.72)
UTI during pregnancy				
No	232 (82.9)	121 (86.4)	Reference	
Yes	48 (17.1)	19 (13.6)	0.75 (0.42, 1.35)	

Table 6: Conditional multivariable logistic regression analysis of factors associated with preterm birth among women in public hospitals of Addis Ababa, Ethiopia, 2019….continued

Variables	**Controls n (%)**	**Cases n (%)**	**COR (95% CI)**	**AOR (95% CI)**
Frequency of ANC visit				
<4	74 (27.8)	61 (48.4)	2.48 (1.55, 3.96)***	3.05 (1.11, 8.37)**
>=4	192 (72.2)	65 (51.6)	Reference	Reference
Husband/partner cigarette smoking				
No	261 (93.2)	99 (70.7)	Reference	Reference
Yes	19 (6.8)	41 (29.3)	4.87 (2.73, 8.70)	6.54 (1.49, 28.62)**
Place for cooking food				
In the house	104 (37.1)	96 (68.6)	3.40 (2.16, 5.37)***	4.59 (1.42, 14.8)**
In a separate building	145 (51.8)	34 (24.3)	1.39 (0.63, 3.09)	0.68 (0.10, 4.44)
Outdoor	31 (11.1)	10 (7.1)	Reference	Reference
Physical Violence				
No	242 (86.4)	81 (57.9)	Reference	Reference
Yes	38 (13.6)	59 (42.1)	4.55 (2.74, 7.57)***	3.98 (1.03, 15.32)**
Sexual violence				
No	230 (82.1)	91 (65.0)	Reference	Reference
Yes	50 (17.9)	49 (35.0)	2.19 (1.42, 3.38)***	1.30 (0.41, 4.12)
Emotional violence				
No	227 (81.1)	82 (58.6)	Reference	Reference
Yes	53 (18.9)	58 (41.4)	2.46 (1.64, 3.70)***	3.64 (1.01, 13.06)**
Control behavior				
No	244 (87.1)	93 (66.4)	Reference	Reference
Yes	36 (12.9)	47 (33.6)	3.21 (1.95, 5.26)***	4.32 (1.10, 16.89)**
Overall type of violence				
No	154 (55.0)	28 (20.0)	Reference	Reference
Yes	126 (45.0)	112 (80.0)	4.15 (2.59, 6.66)***	0.87 (0.17, 4.55)

***P-value <0.01, ** P-value <0.05, COR: crude odds ratio, AOR: adjusted odds ratio

Other[a] includes driver, daily laborer, mechanic, and carpenter.

7. Discussion

In this study, the association between intimate partner violence during pregnancy and preterm birth was assessed. The results showed that physical violence, emotional violence, and controlling behaviors of husbands/partners increased the risk of preterm birth. In addition, maternal education, hypertensive disorder of pregnancy, frequency of ANC, husband's/partner's cigarette smoking and in-door cooking were associated with preterm birth.

Women who had reported exposure to physical violence during their pregnancy were found to have higher odds of preterm birth. Our finding is consistent with the study conducted in Tanzania (29) which had revealed that the presence of a higher risk of preterm birth among women who were exposed to physical violence. As widely discussed elsewhere, physical violence during pregnancy may lead to placental damage, rupture of the membrane and consequently premature uterine contractions that result in premature birth or even fetal demise (10, 11). In contrast, a study conducted in Vancouver, British Columbia (76) reported no statistically significant association between physical violence and preterm birth. However, the Vancouver study assessed the experience of physical violence differently using a single question. Our study used six questions to determine physical violence. Moreover, we presume there is a potential variation in the severity of physical violence experienced by women in the two study areas, which could be another reason for the observed inconsistent finding.

The higher odds of preterm birth among women who had experienced emotional violence during their pregnancy could be explained by alterations that may occur in hormonal levels following emotional disturbances. The hormonal alteration affects hypothalamic–pituitary–adrenal (HPA) activity, a robust pathophysiological biomarker associated with affective disorders, which is regarded as one important mechanism for the observed associations between maternal emotional disturbance such as anxiety disorders and preterm delivery (77, 78). Our finding is in agreement with the study done in Peru (28) where it had identified high odds of preterm birth among women who were exposed to emotional violence. In contrast, the finding of our study is not in line with another study conducted in Tanzania (29), which did not find an association between emotional violence and preterm birth. The disagreement could be partly explained by the difference in the time of the interview. In the study

conducted in Tanzania, women's exposure to violent act was measured at 34 weeks of gestation while it was at postpartum phase in our study.

Likewise, our study showed that the odds of preterm birth was higher among women who had reported controlling behaviors by their husbands/partners. Abused women might not have attended adequate prenatal care, developed unhealthy dietary habits, experienced inadequate weight gain, and exposed for anemia that in turn may be associated with the negative newborn outcomes such as preterm birth. The link between maternal nutrition intake (79, 80), maternal anemia (50, 81), inadequate antenatal care (53) with adverse birth outcomes such as preterm has been described in previous studies.

The current study did not find a statistically significant association between experience of overall type of violence and preterm birth. This is consistent with the finding of the study done in Hossana town which reported the absence of a statistically significant association between overall type of violence during pregnancy and risk of preterm birth (31). Contrary to the current study, the study conducted in Peru (28) had found that maternal exposure to violence was statistically significantly associated with an increased risk of preterm birth. The justification for the inconsistency of findings could be related to the difference in defining overall type of violence. In the study conducted in Peru, any type of violence was defined in terms of physical and sexual violence only while our study had defined it by the physical, sexual, emotional and controlling behavior of husband which is based on the WHO recommendation (71). Additionally, the variation could be explained by the difference in study design in which the study conducted in Peru was unmatched case-control design in contrast to our study which is matched.

Additionally, the current study found that increased odds of preterm birth among women who had attended primary education. The possible justification for this could be women who had attended lower level education (primary level) might have limited access to the general health information, and have a low level of knowledge regarding the risk factors of preterm birth as well as its prevention mechanisms. The finding of our study is consistent with the finding of the study conducted in Quebec residents, Canada (82) and finding from meta-analysis (83) where it identified the excess risk of preterm births was associated with low maternal education level.

Women who experienced a hypertensive disorder of pregnancy had higher odds of preterm birth. The possible explanation of how hypertensive disorder of pregnancy predisposes the women to preterm birth is related to the role of endothelial dysfunction and abnormal placentation which leads to spontaneous preterm birth, intrauterine fetal growth restriction and small-for-gestational-age neonates (84). The finding of the current study is supported by the studies conducted in Gondar (6), Jimma (53), Tanzania (85), Iran (86) and among black women in California (87). In contrast, the study conducted in Addis Ababa had reported that mothers who had hypertensive disorder of pregnancy were less likely to give preterm birth than who had no hypertensive disorder of pregnancy (37). The justification for the discrepancy might be partially due to the difference in their study design where the previous study was conducted based on client medical record review only and without controlling for most of the potential confounding variables unlike ours.

The higher likelihood of preterm birth among women who had less than 4 ANC visits could be justified in terms of the benefit of frequent ANC. When women attended the minimum recommended ANC, they are more likely to be screened and managed for medical and obstetric complications and hence it may facilitate appropriate case management that can help to prevent preterm birth. The finding of our study is in line with the study conducted in Jimma (53), Tanzania (85), Nigeria (88) and China (89) which revealed that women who had attended fewer than four ANC visits had higher odds of preterm birth.

Women whose husbands/partners smoked cigarettes were more likely to experience preterm birth. The possible mechanisms through which smoking exerts its effects on preterm birth is multifactorial. These are nicotine-induced vasoconstriction, carbon monoxide-induced fetal hypoxia, alteration of steroid hormone production, disruption of prostaglandin synthesis, and changing responses to oxytocin (90). The finding of our study is in line with the finding of the study done in Italy (56) where it had reported that environmental tobacco smoke exposure (being a passive smoker) during pregnancy was associated with increased risk of early preterm birth. Additionally, our study finding is consistent with the finding of the study done in California (91) and the finding of meta-analysis (57) where they had identified that passive maternal smoking is associated with an increased risk of preterm birth.

In-door cooking was one of the independent predictors of preterm birth. Women who cooked in the house were more likely to give preterm birth. It could be due to maternal exposure to fine particulate matter while cooking indoor. This result is supported by the study finding

(92) that showed an increased risk of preterm birth among women who had been exposed to fine matter.

8. Strength and limitation of the present study

8.1. Strength of the study

Cases and controls were recruited from the same facility to control for the contextual differences among the study participants. Additionally, the potential confounders were controlled at the design stage by matching the cases and controls and at the analysis phase by employing a multivariable conditional logistic regression analysis model. The low non-response rate was also one of the strengths of the study. Furthermore, the use of intimate partner violence assessment tool that has been validated in ten countries including Ethiopia by the WHO (71) was another strength of the study.

8.2. Limitation of the study

The results of our study should be interpreted in light of the following limitations. Due to the retrospective nature of the study design, our data may possibly be subjected to recall bias. Additionally, since violence is a sensitive issue, there could be a possibility of under-reporting of their IPV experiences. Furthermore, social desirability bias may not be totally avoidable; the study participants may not be fully comfortable to report their actual experience rather they may answer to the questions in a manner that could be viewed as favorable by the society.

9. Conclusion

The study identified that exposure to physical violence, emotional violence and controlling behavior of husband during pregnancy increases the risk of preterm births. Additionally, maternal education, hypertensive disorder of pregnancy, frequency of ANC, husband/partner cigarette smoking, and place for cooking food are the independent predictors of preterm birth. However, sexual violence and the overall type of violence during pregnancy did not have statistically significant associations with preterm birth.

10. Recommendation

To Policy makers / Health programmers

Efforts should be made to design and implement interventions that prevent the occurrence of physical violence, emotional violence and controlling behavior of husband during pregnancy.

In collaboration with non-governmental organizations that are working on maternal health, organizing advocacy campaigns and working with media to raise awareness regarding the health consequence of intimate partner violence during pregnancy is recommended.

Working with the Education Office to empower women with education is recommended.

Promoting the use of a separate kitchen to improve the household environmental condition is recommended.

Efforts should be made to create public awareness about the identified factors associated with preterm delivery.

Establishing screening and intervention programs during ANC follow-up to identify pregnant women who had experienced violence is recommended.

To health care providers

Providing health information to pregnant women and their husbands/partners about the harmful effects of second-hand smoke on preterm birth is required.

There is a need to further promote ANC follow up for at least four visits.

Health professionals should further target women with hypertensive during pregnancy in their ANC follow-up.

To researchers

Further studies should be conducted with a larger sample size and longitudinal study design to verify the findings of this study and include maternal experience with IPV during multiple time points including those before and during the index pregnancy.

11. Reference

1. March of Dimes, PMNCH, Save the Children, WHO. Born Too Soon: The Global Action Report on Preterm Birth.: Eds CP Howson, MV Kinney, JE Lawn. World Health Organization, Geneva. 2012.

2. UNICEF. Every child alive: The urgent need to end newborn deaths. Geneva. 2018.

3. United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). Levels & Trends in Child Mortality: Report 2017, Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation. United Nations Children's Fund, New York. 2017.

4. WHO. Causes of death among children under 5 years. 2018 [Available from: http://www.who.int/gho/child_health/mortality/causes/en/. Accessed 16th July 2018]

5. USAID, PCI, gapps, American College of Nurse-Midwives. Ethiopia: Profile of preterm and low birth weight prevention and care. May 2017 [Available from: https://www.everypreemie.org/country-profiles/. Accessed 19th August2018]

6. Gebreslasie K. Preterm Birth and Associated Factors among Mothers Who Gave Birth in Gondar Town Health Institutions. Advances in Nursing. 2016;2016:1-5.

7. Bekele I, Demeke T, Dugna K. Prevalence of Preterm Birth and its Associated Factors among Mothers Delivered in Jimma University Specialized Teaching and Referral Hospital, Jimma Zone, Oromia Regional State, South West Ethiopia. Women's Health Care. 2017;6:356-66.

8. World Vision Ethiopia. New partnership aims to prevent preterm birth in Ethiopia. Addis Ababa, Ethiopia. 2016 [Available from: https://www.wvi.org/ethiopia/pressrelease/new-partnership-aims-prevent-preterm-birth-ethiopia. Accessed November 282018]

9. Bailey BA. Partner violence during pregnancy: prevalence, effects, screening, and management. International Journal of Women's Health. 2010;2:183–97.

10. Pearlman MD, Tintinalli JE, Lorenz RP. Blunt trauma during pregnancy. New England Journal of Medicine. 1990;323(23):1609-13.

11. Ribe JK, Teggatz JR, Harvey C. Blows to the maternal abdomen causing fetal demise: report of three cases and a review of the literature. Journal of Forensic Science. 1993;38(5):1092-6.

12. Newberger EH, Barkan SE, Lieberman ES, McCormick MC, Yllo K, Gary LT, et al. Abuse of pregnant women and adverse birth outcome: current knowledge and implications for practice. JAMA. 1992;267(17):2370-2.

13. Campbell JC. Health consequences of intimate partner violence. The Lancet. 2002;359(9314):1331-6.
14. Cokkinides VE, Coker AL, Sanderson M, Addy C, Bethea L. Physical violence during pregnancy: maternal complications and birth outcomes. Obstetrics & Gynecology. 1999;93(5):661-6.
15. Hillier SL, Nugent RP, Eschenbach DA, Krohn MA, Gibbs RS, Martin DH, et al. Association between bacterial vaginosis and preterm delivery of a low-birth-weight infant. New England journal of medicine. 1995;333(26):1737-42.
16. Dahlen HG, Munoz AM, Schmied V, Thornton C. The relationship between intimate partner violence reported at the first antenatal booking visit and obstetric and perinatal outcomes in an ethnically diverse group of Australian pregnant women: a population-based study over 10 years. BMJ open. 2018;8(4):e019566.
17. World Health Organization. Understanding and addressing violence against women: intimate partner violence. Geneva: World Health Organization. 2012.
18. Raj A, Silverman J. Violence against immigrant women: The roles of culture, context, and legal immigrant status on intimate partner violence. Violence against women. 2002;8(3):367-98.
19. Alhusen JL, Lucea MB, Bullock L, Sharps P. Intimate partner violence, substance use, and adverse neonatal outcomes among urban women. The Journal of pediatrics. 2013;163(2):471-6.
20. Shamu S, Abrahams N, Temmerman M, Musekiwa A, Zarowsky C. A systematic review of African studies on intimate partner violence against pregnant women: prevalence and risk factors. PloS one. 2011;6(3):e17591.
21. Gossaye Y, Deyessa N, Berhane Y, Ellsberg M, Emmelin M, Ashenafi M, et al. Women's health and life events study in rural Ethiopia. The Ethiopian Journal of Health Development. 2003;17(Second Special issue):1-47.
22. Dendir E, Deyessa N. Intimate maternal partner violence and low birth weight in Addis Ababa Public Hospitals. Ethiop Med J. 2018;56(2).
23. Demelash H, Nigatu D, Gashaw K. A case-control study on intimate partner violence during pregnancy and low birth weight, Southeast Ethiopia. Obstetrics and gynecology international. 2015;2015:1-6.
24. Blencowe H, Cousens S, Chou D, Oestergaard M, Say L, Moller A-B, et al. Born too soon: the global epidemiology of 15 million preterm births. Reproductive health. 2013;10(1):S2.

25. Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. The lancet. 2008;371(9606):75-84.
26. World Health Organization. Intimate partner violence during pregnancy: Information sheet. Geneva: World Health Organization. 2011;WHO/RHR/11.35.
27. Faramarzi M, Esmaelzadeh S, Mosavi S. Prevalence, maternal complications and birth outcome of physical, sexual and emotional domestic violence during pregnancy. Acta Medica Iranica. 2005;43(2):115-22.
28. Sanchez SE, Alva AV, Chang GD, Qiu C, Yanez D, Gelaye B, et al. Risk of spontaneous preterm birth in relation to maternal exposure to intimate partner violence during pregnancy in Peru. Maternal and child health journal. 2013;17(3):485-92.
29. Sigalla GN, Mushi D, Meyrowitsch DW, Manongi R, Rogathi JJ, Gammeltoft T, et al. Intimate partner violence during pregnancy and its association with preterm birth and low birth weight in Tanzania: A prospective cohort study. PloS one. 2017;12(2):e0172540.
30. Urquia ML, O'Campo PJ, Heaman MI, Janssen PA, Thiessen KR. Experiences of violence before and during pregnancy and adverse pregnancy outcomes: an analysis of the Canadian Maternity Experiences Survey. BMC pregnancy and childbirth. 2011;11(1):42-54.
31. Laelago T, Belachew T, Tamrat M. Effect of intimate partner violence on birth outcomes. African health sciences. 2017;17(3):681-9.
32. World Health Organization. Global plan of action to strengthen the role of the health system within a national multisectoral response to address interpersonal violence, in particular against women and girls, and against children. Geneva. 2016.
33. Coker AL, Sanderson M, Dong B. Partner violence during pregnancy and risk of adverse pregnancy outcomes. Paediatric and perinatal epidemiology. 2004;18(4):260-9.
34. Hoang TN, Van TN, Gammeltoft T, Meyrowitsch DW, Thuy HNT, Rasch V. Association between intimate partner violence during pregnancy and adverse pregnancy outcomes in Vietnam: a prospective cohort study. PloS one. 2016;11(9):e0162844.
35. Nunes MAA, Camey S, Ferri CP, Manzolli P, Manenti CN, Schmidt MI. Violence during pregnancy and newborn outcomes: a cohort study in a disadvantaged population in Brazil. European journal of public health. 2010;21(1):92-7.
36. Kaye DK, Mirembe FM, Bantebya G, Johansson A, Ekstrom AM. Domestic violence during pregnancy and risk of low birthweight and maternal complications: a prospective cohort study at Mulago Hospital, Uganda. Tropical Medicine & International Health. 2006;11(10):1576-84.

37. Deressa AT, Cherie A, Belihu TM, Tasisa GG. Factors associated with spontaneous preterm birth in Addis Ababa public hospitals, Ethiopia: cross sectional study. BMC pregnancy and childbirth. 2018;18(1):332-44.
38. Berhe H, Berhe H, Zeleke D. Factors associated with patterns of birth outcome at public hospitals in Mekelle town, Tigray region, Ethiopia, 2013: a case control study. J Bio Innov. 2015;4 (2):67-81.
39. Gebremeskel F, Gultie T, Kejela G, Hailu D, Workneh Y. Determinants of Adverse Birth Outcome among Mothers who Gave Birth at Hospitals in Gamo Gofa Zone, Southern Ethiopia: A Facility Based Case Control Study. Quality in Primary Care. 2017;25(5):259-66.
40. Rogers LK, Velten M. Maternal inflammation, growth retardation, and preterm birth: insights into adult cardiovascular disease. Life sciences. 2011;89(13-14):417-21.
41. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller A-B, Narwal R, et al. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. The Lancet. 2012;379(9832):2162-72.
42. Mwaniki MK, Atieno M, Lawn JE, Newton CR. Long-term neurodevelopmental outcomes after intrauterine and neonatal insults: a systematic review. The Lancet. 2012;379(9814):445-52.
43. Dolatian M, Mirabzadeh A, Forouzan AS, Sajjadi H, Alavimajd H, Mahmoodi Z, et al. Relationship between structural and intermediary determinants of health and preterm delivery. J Reprod Infertil. .2014;15(2):78-86.
44. Abdollahi F, Abhari FR, Charati JY, Rouhani S. Impact of psychological violence on pregnancy outcomes in a prospective study. Iran J Psychiatry Behav Sci. 2014;8(3):22-7.
45. Ferraro AA, Rohde LA, Polanczyk GV, Argeu A, Miguel EC, Grisi SJFE, et al. The specific and combined role of domestic violence and mental health disorders during pregnancy on new-born health. BMC pregnancy and childbirth. 2017;17(1):257-68.
46. Watson LF, Taft AJ. Intimate partner violence and the association with very preterm birth. Birth. 2013;40(1):17-23.
47. Shamu S, Munjanja S, Zarowsky C, Shamu P, Temmerman M, Abrahams N. Intimate partner violence, forced first sex and adverse pregnancy outcomes in a sample of Zimbabwean women accessing maternal and child health care. BMC public health. 2018;18(1):595-05.

48. Audi CAF, Corrêa AMS, Latorre MdRDd, Santiago SM. The association between domestic violence during pregnancy and low birth weight or prematurity. Jornal de pediatria. 2008;84(1):60-7.
49. Okube OT, Sambu LM. Determinants of Preterm Birth at the Postnatal Ward of Kenyatta National Hospital, Nairobi, Kenya. Open Journal of Obstetrics and Gynecology. 2017;7(09):973-88.
50. Abdo R, Endalemaw T, Tesso F. Prevalence and associated factors of adverse birth outcomes among women attended maternity ward at Negest Elene Mohammed Memorial general hospital in hosanna town, SNNPR, Ethiopia. J Women's Health Care. 2016;5:324-34.
51. Bekele T, Amanon A, Gebreslasi K. Pre-term birth and associated factors among mothers who gave birth in Debremarkos town health institutions, 2013 institutional based cross sectional study. Gynecol Obstet. 2015;5(5):292-7.
52. Mandruzzato G, Calì G, Chiaffarino F, Pozzo G, Danti L. Risk factors for late preterm births: a case-control study. Gynecol Obstet. 2013;3(6):182-92.
53. Abaraya M, Seid SS, Ibro SA. Determinants of preterm birth at Jimma University Medical Center, southwest Ethiopia. Pediatric health, medicine and therapeutics. 2018;9:101-12.
54. Adane AA, Ayele TA, Ararsa LG, Bitew BD, Zeleke BM. Adverse birth outcomes among deliveries at Gondar University hospital, Northwest Ethiopia. BMC pregnancy and childbirth. 2014;14(1):90-100.
55. Mund M, Louwen F, Klingelhoefer D, Gerber A. Smoking and pregnancy—a review on the first major environmental risk factor of the unborn. Int J Environ Res Public Health. 2013;10(12):6485-99.
56. Fantuzzi G, Aggazzotti G, Righi E, Facchinetti F, Bertucci E, Kanitz S, et al. Preterm delivery and exposure to active and passive smoking during pregnancy: a case–control study from Italy. Paediatric and perinatal epidemiology. 2007;21(3):194-200.
57. Cui H, Gong T-T, Liu C-X, Wu Q-J. Associations between passive maternal smoking during pregnancy and preterm birth: Evidence from a meta-analysis of observational studies. PLoS One. 2016;11(1):e0147848.
58. Kim YJ, Song IG, Kim K-N, Kim MS, Chung S-H, Choi Y-S, et al. Maternal Exposure to Particulate Matter during Pregnancy and Adverse Birth Outcomes in the Republic of Korea. International journal of environmental research and public health. 2019;16(4):633-43.

59. Leem J-H, Kaplan BM, Shim YK, Pohl HR, Gotway CA, Bullard SM, et al. Exposures to air pollutants during pregnancy and preterm delivery. Environmental health perspectives. 2006;114(6):905-10.
60. Demelash H, Motbainor A, Nigatu D, Gashaw K, Melese A. Risk factors for low birth weight in Bale zone hospitals, South-East Ethiopia: a case–control study. BMC pregnancy and childbirth. 2015;15(1):264-74.
61. Addis Ababa City Administration. Addis Ababa city profile 2018 [Available from: http://www.ethiopia.gov.et/addis-ababa-city-administration. Accessed 20 July 2018]
62. Addis Ababa City Governemnt. Sub Cities. 2017 [Available from: http://www.addisababa.gov.et/de/web/guest/sub-cities Accessed 1st November 2018]
63. UN-Habitat. Ethiopia: Addis Ababa Urban Profile. UNON: Nairobi. 2008.
64. Central Statistical Agency. Population Projections for Ethiopia 2007-2037. Addis Ababa, Ethiopia. 2013.
65. Federal Ministry of Health. Health and Health Related Indicators. Addis Ababa, Ethiopia. 2014.
66. Adugna A. Health institutions and services. Central Statistical Agency, Addis Ababa, Ethiopia. 2014.
67. Sulima M, Lewicka M, Wiktor K, Wiktor H. Analysis of preterm delivery risk factors-a literature review. Journal of Public Health, Nursing and Medical rescue. 2013;16(2013_4):09-15.
68. Michaluk A, Dionne M-D, Gazdovich S, Buch D, Ducruet T, Leduc L. Predicting preterm birth in twin pregnancy: was the previous birth preterm? A Canadian experience. Journal of Obstetrics and Gynaecology Canada. 2013;35(9):793-801.
69. Murray SR, Stock SJ, Cowan S, Cooper ES, Norman JE. Spontaneous preterm birth prevention in multiple pregnancy. The Obstetrician & Gynaecologist. 2018;20(1):57-63.
70. Ooki S. The effect of an increase in the rate of multiple births on low-birth-weight and preterm deliveries during 1975–2008. Journal of epidemiology. 2010;20(6):480-8.
71. García-Moreno C, Jansen HA, Ellsberg M, Heise L, Watts C. WHO multi-country study on women's health and domestic violence against women: initial results on prevalence, health outcomes and women's responses.: Geneva: World Health Organization. 2005.
72. The American College of Obstetricians and Gynecologists. Methods for estimating the due date. Committee Opinion No. 700. Obstet Gynecol. 2017;129:e150–4.
73. Jamshidimanesh M, Soleymani M, Ebrahimi E, Hosseini F. Domestic violence against pregnant women in Iran. Journal of family & reproductive health. 2013;7(1):7-17.

74. Perneger TV, Courvoisier DS, Hudelson PM, Gayet-Ageron A. Sample size for pre-tests of questionnaires. Quality of Life Research. 2015;24(1):147-51.
75. World Health Organization. Putting women first: ethical and safety recommendations for research on domestic violence against women. Geneva: World Health Organization. 2001.
76. Janssen PA, Holt VL, Sugg NK, Emanuel I, Critchlow CM, Henderson AD. Intimate partner violence and adverse pregnancy outcomes: a population-based study. American journal of obstetrics and gynecology. 2003;188(5):1341-7.
77. Pico-Alfonso MA, Garcia-Linares MI, Celda-Navarro N, Herbert J, Martinez M. Changes in cortisol and dehydroepiandrosterone in women victims of physical and psychological intimate partner violence. Biological psychiatry. 2004;56(4):233-40.
78. Yehuda R. Current status of cortisol findings in post-traumatic stress disorder. Psychiatric Clinics of North America. 2002.
79. Carmichael SL, Yang W, Shaw GM. Maternal dietary nutrient intake and risk of preterm delivery. American journal of perinatology. 2013;30(07):579-88.
80. Bloomfield FH. How is maternal nutrition related to preterm birth? Annual review of nutrition. 2011;31:235-61.
81. Rahmati S, MiladAzami, Parizad N, Sayehmiri K. The relationship between maternal anemia during pregnancy with preterm birth: a systematic review and meta-analysis. The Journal of Maternal-Fetal & Neonatal Medicine. 2018:1-151.
82. Luo Z-C, Wilkins R, Kramer MS. Effect of neighbourhood income and maternal education on birth outcomes: a population-based study. Cmaj. 2006;174(10):1415-20.
83. Ruiz M, Goldblatt P, Morrison J, Kukla L, Švancara J, Riitta-Järvelin M, et al. Mothers education and the risk of preterm and small for gestational age birth: a DRIVERS meta-analysis of 12 European cohorts. J Epidemiol Community Health. 2015;69(9):826-33.
84. Premkumar A, Henry DE, Moghadassi M, Nakagawa S, Norton ME. The interaction between maternal race/ethnicity and chronic hypertension on preterm birth. American journal of obstetrics and gynecology. 2016;215(6):787. e1-. e8.
85. Temu TB, Masenga G, Obure J, Mosha D, Mahande MJ. Maternal and obstetric risk factors associated with preterm delivery at a referral hospital in northern-eastern Tanzania. Asian Pacific Journal of Reproduction. 2016;5(5):365-70.
86. Alijahan R, Hazrati S, Mirzarahimi M, Pourfarzi F, Hadi PA. Prevalence and risk factors associated with preterm birth in Ardabil, Iran. Iran J Reprod Med. 2014;12(1):47-56.

87. Premkumar A, Baer RJ, Jelliffe-Pawlowski LL, Norton ME. The Effect of Hypertensive Disorders in Pregnancy on Preterm Birth Rates Among African-American Women [4L]. Obstetrics & Gynecology. 2017;129(5):122S-3S.
88. Iyoke C, Lawani L, Ezugwu E, Ilo K, Ilechukwu G, Asinobi I. Maternal risk factors for singleton preterm births and survival at the University of Nigeria Teaching Hospital, Enugu, Nigeria. Nigerian journal of clinical practice. 2015;18(6):744-50.
89. Zhang X, Zhou M, Chen L, Hao B, Zhao G. Risk factors for preterm birth: a case-control study in rural area of western China. Int J Clin Exp Med. 2015;8(3):4527-32.
90. Ion R, Bernal AL. Smoking and preterm birth. Reproductive Sciences. 2015;22(8):918-26.
91. Kharrazi M, DeLorenze GN, Kaufman FL, Eskenazi B, Bernert Jr JT, Graham S, et al. Environmental tobacco smoke and pregnancy outcome. Epidemiology. 2004:660-70.
92. Malley CS, Kuylenstierna JC, Vallack HW, Henze DK, Blencowe H, Ashmore MR. Preterm birth associated with maternal fine particulate matter exposure: a global, regional and national assessment. Environment international. 2017;101:173-82.

12. Annex

12.1 English version consent and questionnaire

12.1.1. Consent Form

Hello, my name is ____________________(Interviewer). I am working with a postgraduate student of Addis Ababa University, College of Medicine and Health Sciences, School of Public Health. The survey is conducted with the objective of determining the association between woman's health and life during pregnancy with preterm birth. You are one of the women who have been selected to participate in this study. First of all, I would like to assure you that the interview will be made in private. Now, I would like to ask you a few questions if I may, but you can refuse to answer or skip any question I ask. You may end the interview at any time. You can also refuse to participate in the study entirely. Your refusal will not have any problem on the health care you received. I want to assure you that all the information you will provide us will be kept strictly confidential. The interview will takes approximately 20 to 30 minutes to complete. Because of your participation on this study, you will not get any ham and immediate benefit. However, I would also like to inform you that the responses that you will provide us are very essential, not only, for the successful accomplishment of the study, but also for producing relevant information which will be helpful in the planning and implementation of intervention activities to improve maternal and newborn health. Do you have any question you want to ask? If you have further question, you may contact Genet Melak through 0921768617 and/or genetayni@gmail.com. Do you agree to proceed with the interview?

Yes; ----proceed with the interview No; ---- thank and end.

Name of interviewer who sought the consent: ______________________________

Date of data collection: _________________________

Signature: ______________________

Name of supervisor: ____________________ Signature: ________________________

12.1.2. English language questionnaire

Type of respondent: 1. Case 2. Control

Data to be extracted from women's medical record

Gestational age based on LNMP ___________________
Gestational age based on ultrasound ________________
Birth weight of the child ________________ kg or________________ gram

Name of the Hospital:___________________________________

Questionnaire Id: ____________________

Section one: socio-demographic characteristics of the respondent

Now I would like to ask you some questions regarding your background and socioeconomic conditions

S.No	Questions	Response option	Skip
101	When were you born?	[__|__] Month Don't know months………………99 [___|___|___|___] Year Don't know months………………99	
102	What is your age in completed years? **Compare and correct 101 and/or 102 if inconsistent**.	Age in completed years [___|___]	
103	What is your ethnicity?	Amhara……………….………..……1 Oromo ……..…………………..………2 Tigrae…………………..…..……….3 Gurage ………………….……..…….4 Other (specify)___________________5	
104	What is your religion?	Orthodox…………………………..………1 Muslim…………………………..……...2 Protestant……………………….………3	

		Catholic…………………………..…4 Other (specify)____________________96	
105	What is your marital status now? Are you currently married or living together with a man as if married or not in union, or separated, or widowed or divorced?	Married…………………………….1 Living together with a man (but not formally married)………………..…2 Not in union (have boyfriend)………3 Separated …………………………..4	
106	What is your occupation, that is, what kind of work do you mainly do?	Housewife………………………….1 Student……………….………..…2 Government employee…...……..…3 Private employee……..…...…..…..…4 Merchant …………………….…5 Daily laborer……………...……..…6 Other (specify)________...................96	
107	Have you ever attend school?	Yes…………………………………1 No………………………………….0	If NO skip to Q **109**
108	What is the highest level of school you have attended?	Primary (From grade 1-8)……......1 Secondary (from grade 9-12)……..2 Technical/vocational……...………3 Higher…………………………….4	
109	What is the average monthly income of your household? PLEASE ADD INCOME OF ALL MEMBERS OF THE HOUSEHOLD	[___|___|___|___|___] Birr	
110	How many children do you currently have?	[___|___]	
111	What is your household size?	[___|___]	

Section two: socio-demographic characteristics of the husband/ partner

Now I would like to ask you some questions regarding your Husband / partner background and socioeconomic conditions.

S. No	Questions	Response options	Skip
201	Has your husband/partner ever attended school?	Yes…………………………..….1 No…………………….................0	If NO skip to Q 203
202	What is the highest level of school your husband/partner has attended?	Primary (From grade 1-8)……......1 Secondary (from grade 9-12)……..2 Technical/vocational……...………3 Higher…………………………….4 I don’t know………………………99	
203	What is the occupation status of your husband/partner?	Government employee……….1 Private employee………….…2 Merchant…………………..….3 Daily laborer………………..…..4 Other (specify)_____.............96	

Section three: Medical history of respondents

Now I would like to ask you some questions about your previous medical conditions

S. No	Questions	Response option	Skip
301	Have you experience diabetics during your recent pregnancy?	Yes………………………………..1 No…………………………………0	
302	Did you experienced hypertensive disorder during your recent pregnancy?	Yes…………………………..….……1 No…………………………….……...0	
303	Did you experienced hemorrhage/ bleeding during your recent pregnancy	Yes……………………………..….……1 No…………………………….………..0	
304	Did you experienced urinary tract infection during your recent pregnancy?	Yes…………………………….………1 No…………………………….……....0	
305	Did you experienced STIs	Yes ……………………….………...1	

	during your recent pregnancy?	No………………………..………0	
306	Have you ever been tasted your HIV status during your recent pregnancy?	Yes ………………………………1 No………………………………..0	If No skip to Q401
307	If yes for question 306 what was the result?	Positive…………………………..1 Negative…………………………2 I don't know……………………...99	

Section four: Reproductive characteristics of respondents

Now I would like to ask you some questions about your (previous) pregnancies, births and related reproductive health characteristics

S.No	Question	Response options	Skip
401	Now, I would like to ask about all the pregnancies you have had during your life. During your life how many times have you been pregnant?	# of times mother was pregnant [___|___]	
402	When you got pregnant with baby you just delivered, did you want to get pregnant at that time? (Planned)	Yes…………………………1 No…………………………..0	
403	Now, I would like to ask about all the births you have had during your life. During your life how many times have you given birth (including the birth you just had here)?	# of times mother gave birth [___|___]	If premipara skip to Q 413
404	On what **day and months** was **this** baby born?	[__|__] day Don't know day……..………99 [__|__] Month Don't know month……………99 [_2__|__0_|_1__|_1__] Year	
405	On what **day, months and year** was your **previous** baby born?	[__|__] day Don't know day……………99 [__|__] Month	

		Don't know months…………..99 [___|___|___|___] Year Don't know year……………..99	
406	How long is the time gap between your previous and current Childbirth? Compare and correct 404 and/or 405 if inconsistent.	[__|__] Month Don't know months…………..99 [___|___|___|___] Year Don't know year………….……99	
407	Have you ever had a fetus died in utero before birth?	Yes……………………1 No…………………….0	If No skip to Q 409
408	During your life, how many times have you had fetus died in utero?	# of times mother had IUFD [___|___]	
409	Have you ever given birth to a preterm child (between 28 – $36^{+6/7}$ weeks of gestation) (including the birth you just had here)?	Yes…………………1 No…………………..0	If No skip to Q 411
410	During your life, how many times have you given birth to a preterm child **(between 28 – $36^{+6/7}$ weeks of gestation) (including the birth you just had here)?**	# of times mother gave birth to preterm [___|___]	
411	Have you ever given birth to low birthweight?	Yes…………………1 No…………………..0	If No skip to Q 413
412	During your life, how many times have you given birth to Low birth weight?	# of times mothers given birth to Low birth weight [___|___]	
413	Have you ever had abortion/pregnancy terminated before 28 weeks of gestation?	Yes…………………1 No…………………..0	If No skip to Q 501
414	During your life, how many times have you had abortion/pregnancy terminated before 28 weeks of gestation?	# of times mother had abortion [___|___]	

Section five: Maternity care utilization

Now I would like to ask you some questions about the antenatal care.

S. No	Questions	Response options	Skip
501	Did you received antenatal care for your recent pregnancy?	Yes………………………1 No………………………..0	If No skip to Q 601
502	How many weeks pregnant were you	[___|___] Weeks pregnant	

	when you first received antenatal care for your last pregnancy?		
503	How many times did you receive antenatal care during this pregnancy?	# Of times ANC received [___|___]	
504	Did you receive Iron/Folic acid during your ANC visit? **Probe by telling the color of iron/folic acid or showing iron/ folic acid tablet/syrup.**	Yes…………………………1 No…………………………..0	If No skip to Q 601

Section six: Substance use

Now I would like to ask about use of substance and drinking alcohol in your life and during pregnancy

S. No	Questions	Response options	Skip
601	Have you ever smoked cigarettes?	Yes………………….1 No…………………...0	If No skip to Q 604
602	Were you smoking cigarette anytime during your recent pregnancy?	Yes …………………1 No…………………..0	If No skip to Q 604
603	How often were you smoking cigarette during your recent pregnancy?	Daily.………………………1 Few times per week………. 2 Rarely.……………………..3	
604	Have you ever taken a drink that contains alcohol (Tella/ Tegi/ Areke/ Beer/ Wine, etc.)?	Yes………………………1 No……………………….0	If No skip to Q 607
605	Did you drink anything that contains alcohol during your last pregnancy?	Yes………………………1 No……………………….0	If No skip to Q 607
606	How often were you drinking anything that contains alcohol during your recent pregnancy?	Daily. ……………………1 Few times per week ……..2 Rarely. …………………..3	
607	Have you ever smoke Shisha?	Yes………………………1 No……………………….0	If No skip to Q 610
608	Did you smoke Shisha anytime during your last pregnancy?	Yes………………………1 No……………………….0	If No skip to Q 610
609	How often were you smoking Shisha during your last pregnancy?	Daily.…………………….1 Few times per week…….. 2 Rarely.…………………….3	
610	Have you ever chew Khat?	Yes………………………1 No……………………….0	If No skip to Q 701
611	Were you chew khat anytime during your recent pregnancy?	Yes………………………1 No………………………..0	If No skip to Q 701
612	How often were you chew khat during your recent pregnancy?	Daily.……………………..1 Few times per week………2 Rarely.…………………….3	

Section seven: Husband's/Partner's current substance use

Now I would like to ask about your husband's/partner's use of substance and drinking alcohol in his life

S.No	Questions	Response options	Skip
701	Do your Husband/ Partner currently smoke cigarette?	Yes…………...........1 No………………..…0	If No skip to Q703
702	How often do your Husband/Partner smoking cigarette?	Daily.………………1 Few times per week…2 Rarely.………………3	
703	Do your Husband/Partner currently drink alcohol?	Yes ………………….1 No……………………0	If No skip to Q 705
704	How often do your Husband/Partner drink alcohol?	Daily.………………..1 Few times per week.…2 Rarely.……………….3	
705	Do your Husband/Partner currently smoke Shisha?	Yes………………..….1 No…………………...0	If No skip to Q 707
706	How often do your Husband/Partner Smoke Shisha?	Daily.…………………1 Few times per week…..2 Rarely.………………..3	
707	Do your Husband/Partner currently chew khat?	Yes…………………….1 No…………………......0	If No skip to Q 801
708	How often were your Husband/Partner chew khat?	Daily.………………….1 Few times per week……2 Rarely.…………………3	

<u>Section eight</u>: Exposure to smoking inside the house (proxy for indoor air pollution)

Now I would like to ask about exposure to smoking inside the house

S. No	Questions	Response options	Skip
801	Where is your place for cooking food?	In the house……………………1 In a separate building………….2 Outdoors………………………3 Other specify ___....................96	If outdoors skip to Q 803
802	If you are using inside the house or separate room to cook food (based on Q801), which one of the following air conditioning means are found in the room?	windows (fanlight, hopper, or sliding sash windows)………1 mechanical apparatuses (fans and air conditioner)…………2 Have no window and mechanical apparatus. …………………3	

803	What type of cooking fuel do you use?	Electricity……………………...1 Natural gas/biogas…………….2 Kerosene………………………3 Charcoal ………………………4 Wood…………………………..5 Straw/shrubs/grass…………….6 Agricultural crop……………..7 Animal dung…………………..8 No food cooked in household….9 Other specify___....................96	

<u>Section nine</u>: Women's health and life experiences during pregnancy

Finally, I would like to ask you some questions about your health and life experiences during pregnancy (The next questions are about things that happens to many women, and that your current husband/partner may have done to you. I want you to tell me if your current husband/ partner did the following things during your pregnancy period)

S.No	**Questions**	**Response options**					**Skip**
		A)If yes go to B)		B)During your pregnancy, how many times did this has happened once, a few time or many times?			
		Yes	**No**	**One**	**Few**	**Many**	
901	Has your husband/partner during your recent pregnancy… 1.Slapped you or threw something at you that could hurt you?	**1**	**0**	**1**	**2**	3	
	2.Pushed you or shoved you?	1	0	1	2	3	
	3.Hit you with his fist or with something else that could hurt you?	1	0	1	2	3	

	4.Kicked you, dragged you beaten you up?	1	0	1	2	3	
	5.Choked or burned you on purpose?	1	0	1	2	3	
	6.Threatened to use or actually used a gun, knife or other weapon against you?	1	0	1	2	3	
902	Has your partner during your pregnancy period…						
	1. Physically forced you to have sexual intercourse when you did not want to?	**1**	**0**	**1**	**2**	**3**	
	2. Did you ever have sexual intercourse which you did not want because you were afraid that he might want it?	**1**	**0**	**1**	**2**	**3**	
	3. Did he ever force you to do something sexual that you found degrading or humiliating?	**1**	**0**	**1**	**2**	**3**	
903	Has your partner during your recent pregnancy period… 1. Insulted you or made you feel bad about yourself?	**1**	**0**	**1**	**2**	**3**	
	2. Belittled or humiliated you in front of other people?	**1**	**0**	**1**	**2**	**3**	
	3. Do things to scare or intimidate you on purpose, e.g. by the way he looked at you, by yelling or smashing things?	**1**	**0**	**1**	**2**	**3**	
	4. Threatened to hurt you or someone you care about?	**1**	**0**	**1**	**2**	**3**	
904	Has your partner during your recent pregnancy period… 1.Tried to keep you from seeing your friends?	**1**	**0**	**1**	**2**	**3**	

	2. Tried to restrict contact with your family of birth?	**1**	**0**	**1**	**2**	**3**	
	3. Insisted on knowing where you are at all times?	**1**	**0**	**1**	**2**	**3**	
	4. Ignored you and treated you indifferently.	**1**	**0**	**1**	**2**	**3**	
	5. Got angry if you spoke with another man?	**1**	**2**	**1**	**2**	**3**	
	6. Was often suspicious that you were unfaithful?	**1**	**0**	**1**	**2**	**3**	
	7. Expected you to ask his permission before seeking health care for yourself?	**1**	**2**	**1**	**2**	**3**	

Thank you very much for your time. I am ready to explain you any question if you have.

Name of data collectors____________ Signature_____________ Date______________

12.2. የአማርኛ ቋንቋ የስምምነት ማስገንዘቢያ ቅጽና መጠይቅ

12.2.1. የስም ምነት ማ ስገንዘቢያ ቅጽ

ጤና ይስጥልኝ፡፡____________እባላለዉ። እኔ በአዲስ አበባ ዩኒቨርሲቲ ፣ የህክምናና ጤና ሳይንስ ኮሌጅ፣ የሕብረተሰብ ጤና ትምህርት ቤት የድህረ ምርቃ ተማሪ በሚያደርጉት ጥናት ላይ በመረጃ ሰብሳቢነት እየሰራሁ እገኛለዉ። ይህ ጥናት የሚካሄደው በእርግዝና ወቅት ሴቶች በሚገጥማቸው የጤና እንዲሁም የህይወት ገጠመኝ እና የመወለጃ ጊዜያቸው ከመድረሱ በፊት በሚወለዱ ህጻናት መካከል ያለውን ግንኙነት ለማወቅ ነው። በጥናቱ እንዲሳተፉ ከተመረጡ ሴቶች መካከል አንዷ እርስዎ ነዎት።

በመጀመሪያ ቃለመጠይቁን ለብቻችን ሆነን እንደምናከናውን ልገልጽሎት እፈልጋለሁ፡፡የሚፈቅዱልኝ ከሆነ ወደ ጥያቄው እሄዳለሁ ፤ ነገር ግን የምጠይቅዎትን ማንኛውም ጥያቄ አለመመለስ ወይም መዝለል ይችላሉ። እንዲሁም በማንኛውም ጊዜ ጥያቄውን ማቋረጥና በጥናቱ አለመሳተፍም ይችላሉ፤ ነገር ግን በፈቃደኝነት የሚሰጡት መረጃ በጣም አስፈላጊ የሚሆነው ጥናቱን ለማጠናቀቅ ብቻ ሳይሆን የእናቶችንና የህጻናትን ጤና ለማሻሻል አስፈላጊ የሆኑ እቅድና ተግባራትን ለማውጣትና በተግባር ለማዋል ይጠቅማል፡፡

በጥናቱ አልሳተፍም ቢሉ በሚያገኙት የጤና አገልግሎት ላይ የሚያመጣው ምንም አይነት ችግር አይኖርም፡፡ ይህ የሚሰጡት መርጃ በሚስጥር የሚጠበቅ መሆኑን ላረጋግጥልዎት እፈልጋለሁ። ቃለ መጠይቁ ከ 20 እስከ 30 ደቂቃ ይወስዳል። በጥናቱ ላይ በመሳተፍዎም የሚደርስቦት ችግር ወይም የሚያገኙት ግዜያዊ ጥቅም አይኖርም።የሚሰጡት መረጃ ለጥናቱ ብቻ የሚዉል ሲሆን፤ ሚስጥራዊነቱንም ለመጠበቅ ስምዎት ጥናቱ ላይ አይገለፅም:: መጠየቅ የሚፈልጉት ጥያቄ አለ? ጥናቱን በተመለከተ ሊብራራልዎት የሚፈልጉት ነገር ካለ መጠየቅ ይችላሉ።
ለበለጠ መረጃ : የጥናቱን ዋና መሪ ገነት መላከን በሚከተለዉ አድራሻ ማግኘት ይችላሉ።

ኢሜል : genetayni@gmail.com ወይም **ስልክ ቁጥር፡ 09-21-76-86-17**

ከላይ በገለጽኩሎዎት መሰረት በጥናቱ ለመሳተፍ ተስማምተዋል?

እዎ ከሆነ ----ቃለ መጠይቁን ማድረግ ቀጥል(ይ) **አይ** ከሆነ -------አመስግነህ(ሽ) አቁም(ሚ)

የመጠይቁ ዉጤት ማረጋገጫ (በጥናቱ ተቆጣጣሪ ባለሙያ መረጋገጥ አለበት)

ሙሉ በሙሉ የተሞላ ☐

በከፊል የተሞላ ☐

የመረጃ ሰብሳቢዉ ስም፡................................ ፊርማ፡......................

መረጃው የተሰበሰበበት ቀን፡................................

የተቆጣጣሪው (ሱፐርቫይሰሩ) ስም፡.. ፊርማ፡................

12.2.2. የአማርኛ ቋንቋ መጠይቅ

የተጠያቂው አይነት 1. ጊዜው/ዋ ከመድረሱ በፊት የተወለደ/ች ህጻን እናት (Case)

2. ጊዜውን/ዋን ጠብቆ/ቃ የተወለደ/ች ህጻን እናት (Control)

ከታካሚዋ የህክምና ማህደር የሚሰበሰቡ መረጃዎች

ከመጨረሻው የወር አበባ በመነሳት የእርግዝናው እድሜ፡_______
በአልትራሳውንድ መሳርያ ምርመራ መሰረት የእርግዝናው እድሜ:_______
የተወለደው/ችው ህጻን የሰውነት ክብደት__________ኪ.ግ ወይም ________ ግራም

ጥናቱ የሚከናወንበት ሆስፒታል ስም: ______________________________

የመጠይቁ መለያ ቁጥር____________

ክፍል 1፡ ስነ ህዝብና ማህበራዊ ኩነታትን የተመለከቱ ጥያቄዎች

በመጀመሪያ የተወሰኑ ስነ ህዝብና ማህበራዊ ኩነታትን የሚመለከቱ ጥያቄዎች እጠይቅዎታለሁ።

ጥ. ቁጥር	ጥያቄዎች	አማራጭ መልሶች	ወደ ጥያቄ...ይዝለሉ
101	በምን ወር ና አመተ ምህረት ነዉ የተወለዱት ?	[__|__] ወር ወሩን አላስታውሰዉም................................99 [___|___|___|___] ዓመተ ምህረት ዓመተ ምህረቱን አላስታውሰውም.................99	
102	እድሜዎ ስንት ነው? ***ከጥያቄ ቁጥር 101 ጋር በማመሳከር ልዩነት ካለው ጥያቄ ቁጥር 101 እና/ወይም 102ን ያስተካክሉ።***	[___|___] አመት	
103	ብሔርዎ ምንድነው?	አማራ..1 ኦሮሞ..2 ትግሬ..3 ጉራጌ..4 ሌላ ከሆነ ይጠቀስ____________........................96	
104	ሐይማኖትዎ ምንድንው?	ኦርቶዶክስ ....1 ሙስሊም..2 ፕሮቴስታንት.....................................3 ካቶሊክ...4 ሌላ ከሆነ ይጠቀስ____________........................96	
105	የትዳር ሁኔታዎ ምን ይመስላል? **ያገቡ፣ አብረው የሚኖሩ (ነገር ግን በህጋዊ መልኩ ያልተጋቡ) ፣ አብረው የማይኖሩ**	ያገቡ..1 አብረው የሚኖሩ (ነገር ግን በህጋዊ መልኩ ያልተጋቡ).........2	

	(በጓደኝነት ደረጃ ያሉ)፣ የተለያየ ቦታ የሚኖሩ (ነገር ግን የተጋቡ) ፣ የተፋቱ ወይም ባል የሞተባቸው	አብረው የማይኖሩ (በጓደኝነት ደረጃ ያሉ)...........3 የተለያየ ቦታ የሚኖሩ (ነገር ግን የተጋቡ)..............4	
106	ስራዎ ምንድነው?	የቤት እመቤት..1 ተማሪ...2 የመንግስት ሰራተኛ..3 የግል ተቀጣሪ...4 ነጋዴ...5 የቀን ሰራተኛ...6 ሌላ ከሆነ ይጠቀስ...96	
107	የመደበኛ ትምህርት ተከታትለው ያውቃሉ?	አዎ..1 አይ 0	**መልሳቸው አይ ከሆነ ወደ 109 ይዝለሉ**
108	ከፍተኛ የተከታተሉት የትምህርት ደረጃዎን ይግለጹልኝ?	አንደኛ ደረጃ (ከ 1ኛ-8ኛ ክፍል).................1 ሁለተኛ ደረጃ(ከ 9ኛ-12ኛ ክፍል).................2 ቴክኒካልና ቮኬሽናል..3 ከፍተኛ (ዲፕሎማና ከዚያ በላይ)..............4	
109	በአማካኝ የቤተሰብዎ የወር ገቢ ምን ያህል ነው? **የጠቅላላ ቤተሰብዎን የወር ገቢ በመደመር ይናገሩ።**	[___|___|___|___|___] የኢትዮጵያ ብር	
110	በአሁኑ ሰዓት ምን ያህል በህይወት ያሉ ልጆች አልዎት?	[___|___]	
111	የጠቅላላ ቤተሰብዎ አባላት ብዛት ምን ያህል ነው?	[___|___]	

ክፍል 2፡ የባል/ጓደኛ ሁኔታን የሚመለከቱ ጥያቄዎች

አሁን ደግሞ ባለቤትዎ/ጓደኛዎ የሚመለከቱ ጥያቄዎችን ልጠይቅዎ።

ጥ. ቁጥር	ጥያቄዎች	አማራጭ መልሶች	ወደ ጥያቄ...ይዝለሉ
201	ባለቤትዎ/ጓደኛዎ የመደበኛ ትምህርት ተከታትለው ያውቃሉ?	አዎ..1 አይ 0	**መልሳቸው አይ ከሆነ ወደ 203 ይዝለሉ**
202	የባለቤትዎ/ ጓደኛዎ የትምህርት ደረጃን ይግለጹልኝ?	አንደኛ ደረጃ (ከ 1ኛ-8ኛ ክፍል)............................1 ሁለተኛ ደረጃ(ከ 9ኛ-12ኛ ክፍል)..........................2 ቴክኒካልና ቮከሽናል ....3 ከፍተኛ (ዲፕሎማና ከዚያ በላይ).........................4 አላውቅም...99	
203	የባለቤትዎ/ጓደኛዎ ስራ ምንድነው?	የመንግስት ሰራተኛ...1 የግል ተቀጣሪ..2 ነጋዴ...3	

		የቀን ሰራተኛ..4 ሌላ ከሆነ ይጠቀስ_______________...............96	

ክፍል 3፡ የእናት የጤንነት (የህክምና) ታሪከን የሚመለከቱ ጥያቂዎች

አሁን ከእርስዎ ጤንነት (የህክምና) ታሪከ ጋር የተያያዙ ጥያቄዎች እጠይቅዎታለሁ፡፡

ጥ. ቁጥር	ጥያቄዎች	አማራጭ መልሶች	ወደ ጥያቄ ...ይዝለሉ
301	ይህንን/ችን ልጅ ነብሰ ጡር በነበሩበት ወቅት የስኳር በሽታ አሞዎት ነበር?	አዎ...1 አይ 0	
302	ይህንን/ችን ልጅ ነብሰ ጡር በነበሩበት ወቅት የደም ግፊት ህመም አሞዎት ነበር?	አዎ...1 አይ 0	
303	ይህንን/ችን ልጅ ነብሰ ጡር በነበሩበት ወቅት በማህጸን በኩል የተከሰተ የደም መፍሰስ ችግር ገጥምዎት ነበር?	አዎ..1 አይ 0	
304	ይህንን/ችን ልጅ ነብሰ ጡር በነበሩበት ወቅት የሽንት ቧንቧ ህመም (ኢንፌክሽን) ገጥምዎት ነበር?	አዎ...1 አይ 0	
305	ይህንን/ችን ልጅ ነብሰ ጡር በነበሩበት ወቅት የአባላዘር ህመም ገጥምዎት ነበር?	አዎ...1 አይ 0	
306	ይህንን/ችን ልጅ ነብሰ ጡር በነበሩበት ወቅት የኤች/አይ/ቪ ምርመራ አድርገው ነበር?	አዎ..1 አይ 0	**መልሳቸው አይ ከሆነ ወደ 401 ይዝለሉ**
307	**ለጥያቄ ቁጥር 306** መልስዎ አዎ ከሆነ ውጤቱ ምን ነበር?	ፖዘቲቭ...1 ኔጋቲቭ...2 አላውቅም.......................................99	

ክፍል 4: ከእናት እርግዝና እና ወሊድ ጋር የተያያዙ ጥያቄዎች

አሁን ደግሞ ከዚህ ቀደም እንዲሁም አሁን ከነበረው እርግዝና ፣ ወሊድና ተያያዥ ሁኔታዎች ጋር የተያያዙ ጥያቄዎችን እጠይቅዎታለሁ፡፡

ጥ. ቁጥር	ጥያቄዎች	አማራጭ መልሶች	ወደጥያቄ...ይዝለሉ
401	በመጀመሪያ በህይወት ዘመንዎ ስለነበረው እርግዝና ልጠይቀዎት፡፡ በህይወት ዘመንዎ አሁን የወለዱትን ጨምሮ ምን ያህል ግዜ አርግዘው ያውቃሉ?	ምን ያህል ግዜ እንዳረገዙ ቁጥሩን ይጻፉ [__|__]	
402	ይህንን/ችን ህጻን ነብሰጡር በሆኑበት ወቅት	አዎ................................1	

	እርግዝናዎ **የታቀደ** ነበር?	አይ...................................0	
403	አሁን ደግሞ በህይወት ዘመንዎ ስለነበረው ወሊድ ልጠይቀዎት። አሁን የወለዱትን ጨምሮ በህይወት ዘመንዎ ስንት ልጆች ወልደዋል? **(ይህ ከ28 ሳምንት የእርግዝና ግዜ በኋላ ነገር ግን ከመወለጃ ግዜያቸው በፊት (ከ36[+6/7] ሳምንት በፊት) የተወለዱ እንዲሁም ሞተው እና በህይወት የተወለዱ ሕጻናትን ይጨምራል)**	# ምን ያህል ግዜ እንደወለዱ ቁጥሩን ይጻፉ [__|__]	**መልሳቸው አንድ ግዜ ብቻ ከሆነ ወደ 413 ይዝለሉ**
404	አሁን የወለዱት (ዷት)ን ህጻን የወለዱበት ቀንና ወር መች ነው?	[_|_] ቀን ቀኑን አላስታውስም...................99 [_|_] ወር ወሩን አላስታውስም....................99 [_2_|_0_|_1|_1_] ዓመተ ምህረት	
405	አሁን ከወለዱት (ዷት) ህጻን በፊት የወለዱትን (ዷት) ልጅ የወለዱበት ቀን/ ወር/ ዓመተ ምህረት መች ነበረ?	[_|_] ቀን ቀኑን አላስታውስም....................99 [_|_] ወር ወሩን አላስታውስም...........99 [__|__|__|__] ዓመተ ምህረት ዓመተ ምህረቱን አላስታውሰውም......99	
406	ከዚህ በፊት በነበረውና፤በዚህኛው ወሊድ መካከል የምን ያህል ግዜ ርቀት ነበረው? **ከጥያቄ ቁጥር 404 እና 405 ጋር በማመሳከር ልዩነት ካለው ጥያቄ ቁጥር 404 እና/ወይም 405ን ያስተካክሉ ።**	[_|_] ወር **ወይም** [_|_] አመት	
407	ከመወለዱ አስቀድም በማህጸን ውስጥ እያል ህይወቱ የጠፋ ልጅ ወልደው ያውቃሉ?	አዎ.................................1 አይ................................0	**መልሳቸው አይ ከሆነ ወደ 409 ይዝለሉ**
408	ለጥያቄ 408 መልስዎ አዎ ከሆነ በህይወት ዘመንዎ ምን ያህል በማህጸን ውስጥ እያለ ህይወቱ የጠፋ ልጅ ወልደው ያውቃሉ?	በማህጸን ውስጥ እያለ ህይወቱ ጠፍቶ የተወለደ(ዱትን) ልጅ (ጆችን)ቁጥር ይመዝግቡ [__|__]	
409	ከዚህ በፊት የመወለጃ ቀኑ ሳይደርስ ልጅ ወልደው ያውቃሉ (preterm birth)?	አዎ................................1 አይ................................0	**መልሳቸው አይ ከሆነ ወደ 411 ይዝለሉ**
410	ለጥያቄ 410 መልስዎ አዎ ከሆነ በህይወት ዘመንዎ ምን ያህል ልጅ ከመወለጃው ቀን አስቀድሞ (preterm birth) ወልደው ያውቃሉ?	ከመወለጃው ቀን አስቀድም *የተወለደ (ዱትን) ልጅ (ጆችን)ቁጥር ይመዝግቡ* [__|__]	
411	የሰውነት ክብደቱ/ቷ ዝቅትኛ (ከ2.5ኪ.ግ በታች) የሆነ/ች ልጅ ወልደው ያውቃሉ?	አዎ..1 አይ..0	**መልሳቸው አይ ከሆነ ወደ 413 ይዝለሉ**
412	ለጥያቄ 412 መልስዎ አዎ ከሆነ በህይወት	የሰውነቱ/ቷ ክብደት አነስተኛ ሆኖ/ና	

	ዘመንዎ ምን ያህል የሰውነት ክብደቱ/ቷ ዝቅትኛ (ከ2.5ኪ.ግ በታች) የሆነ/ች ልጅ ወልደው ያውቃሉ?	የተወለደ/ች (ዱትን) ልጅ (ጆችን)ቁጥር ይመዝግቡ [__|__]	
413	የጽንስ መቋረጥ ገጥምዎት ያውቃል?	አዎ................................1 አይ..............................0	**መልሳቸው አይ ከሆነ ወደ 501 ይዝለሉ**
415	ለጥያቄ 414 መልስዎ አዎ ከሆነ በህይወት ዘመንዎ ምን ያህል የጽንስ መቋረጥ ገጥምዎት ያውቃል?	የገጠማቸውን የጽንስመቋረጥ ቁጥር ይመዝግቡ [__|__]	

ክፍል 5፡ የጤና ተቋምን ከመጠቀም ጋር የተያያዙ ጥያቄዎች

የቅድመ ወሊድ የጤና አገልግሎትን በተመለከተ ጥቂት ጥያቄዎን ልጠይቆዎት እፈልጋለሁ።

ጥ. ቁጥር	**ጥያቄዎች**	**አማራጭ መልሶች**	**ወደ ጥያቄ...ይዝለሉ**
501	ይህንን/ችን ህጻን ነብሰ ጡር በሆኑበት ወቅት የቅድመ ወሊድ ክትትል አድርገው ነበር?	አዎ...1 አይ..0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 601 ይዝለሉ**
502	ለጥያቄ ቁጥር 501 መልስዎ አዎ ከሆነ፤ የመጀመሪያውን የቅድመ ወሊድ ክትትል ሲያደርጉ የእርግዝናዎ እድሜ ምን ያህል ነበር?	[__|__] ሳምንት ነፍሰ ጡር **ወይም** [__|__] ወር ነፍሰ ጡር	
503	ለጥያቄ ቁጥር 501 መልስዎ አዎ ከሆነ፤ ለምን ያህል ግዜ የቅድመ ወሊድ ክትትል አድርገው ነበር?	[__|__] ግዜ	
504	በቅድመ ወሊድ ክትትል ወቅት ለደም ማነስ የሚሰጥ መድኃኒት (Iron/Folic Acid) ተሠጥቶዎት ነበር? **የመድኃኒቱን/ ሽሮፑን ቀለም በመናገር ወይም በማሳየት እንዲያስታዉሱ ያድርጉ**	አዎ...1 አልተሰጠኝም.................................0	**መልሳቸው አልተሰጠኝም ከሆነ ወደ ጥያቄ ቁጥር 601 ይዝለሉ**

ክፍል 6: ከእናት እጽ የመጠቀምና አልኮል ከመጠጣት ልምድ ጋር የተያያዙ ጥያቄዎች

አሁን ደግሞ በህይወት ዘመንዎ እንዲሁም በእርግዝናዎ ወቅት ስለነበረዎት እጽ ከመጠቀምና አልኮል ከመጠጣት ጋር የተያያዙ ጥያቄዎችን ልጠይቅዎ።

ጥ. ቁጥር	**ጥያቄዎች**	**አማራጭ መልሶች**	**ወደጥያቄ...ይዝለሉ**
601	በህይወት ዘመንዎ ሲጋራ አጭሰው ያውቃለ?	አዎ...1 አይ...0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 604 ይዝለሉ**
602	ይህንን/ችን ህጻን ነብሰ ጡር በነበሩበት ወቅት ሲጋራ ያጨሱ ነበር?	አዎ...1 አይ...0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 604 ይዝለሉ**

603	ለጥያቄ ቁጥር 602 መልስዎ አዎ ከሆነ ፤ ምን ያህል ግዜ ሲጋራ ያጨሱ ነበር በየቀኑ፣ በሳምንት ጥቂት ግዜ፣ አልፎ አልፎ?	በየቀኑ.......................................1 በሳምንት ጥቂት ግዜ.........................2 አልፎ አልፎ...3	
604	በህይወት ዘመንዎ አልኮል ያለው መጠጥ (ጠላ ፣ ጠጅ፣ አረቂ፣ ቢራ፣ ወይን፣ ወዘት) ጠጥተው ያውቃለ?	አዎ..1 አይ..0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 607 ይዝለሉ**
605	ይህንን/ችን ህጻን ነብሰ ጡር በነበሩበት ወቅት አልኮል ያለው መጠጥ (ጠላ ፣ ጠጅ፣ አረቂ፣ ቢራ፣ ወይን፣ ወዘት) ይጠጡ ነበር?	አዎ...1 አይ...0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 607 ይዝለሉ**
606	ለጥያቄ ቁጥር 605 መልስዎ አዎ ከሆነ ፤ ምን ያህል ጊዜ የአልኮል መጠጥ ይጠጡ ነበር በየቀኑ፣ በሳምንት ጥቂት ግዜ፣ አልፎ አልፎ?	በየቀኑ..1 በሳምንት ጥቂት ግዜ.............................2 አልፎ አልፎ...3	
607	በህይወት ዘመንዎ ሺሻ (shisha) አጭሰዉ ያዉቃሉ	አዎ..1 አይ...0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 610 ይዝለሉ**
608	ይህንን/ችን ህጻን ነብሰ ጡር በነበሩበት ወቅት ሺሻ (shisha) ያጩሱ ነበር?	አዎ..1 አይ...0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 610 ይዝለሉ**
609	ለጥያቄ ቁጥር 608 መልስዎ አዎ ከሆነ ፤ ምን ያህል ጊዜ ሺሻ (shisha) ያጩሱ ነበር በየቀኑ፣ በሳምንት ጥቂት ግዜ፣ አልፎ አልፎ?	በየቀኑ..1 በሳምንት ጥቂት ግዜ...........................2 አልፎ አልፎ...3	
610	በህይወት ዘመንዎ ጫት ቅመዉ ያዉቃሉ?	አዎ..1 አይ...0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 701 ይዝለሉ**
611	ይህንን/ችን ህጻን ነብሰ ጡር በነበሩበት ወቅት ጫት ይቅሙ ነበር?	አዎ..1 አይ...0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 701 ይዝለሉ**

612	ለጥያቄ ቁጥር 613 መልስዎ አዎ ከሆነ ፤ ምን ያህል ጊዜ ጫት ይቅሙ ነበር በየቀኑ፣ በሳምንት ጥቂት ግዜ፣ አልፎ አልፎ??	በየቀኑ..1 በሳምንት ጥቂት ግዜ...............................2 አልፎ አልፎ..3	

ክፍል 7፡ ከባለቤትዎ/ከጓደኛዎ እጽ የመጠቀምና አልኮል የመጠጣት ልምድ ጋር የተያያዙ ጥያቄዎች

አሁን ደግሞ ከባለቤትዎ/ጓደኛዎ እጽ የመጠቀምና አልኮል የመጠጣት ልምድ ጋር የተያያዙ ጥያቄዎችን ልጠይቅዎ።

ጥ. ቁጥር	ጥያቄዎች	አማራጭ መልሶች	ወደጥያቄ...ይዝለሉ
701	ባለቤትዎ/ ጓደኛዎ ሲጋራ ያጨሳሉ?	አዎ...1 አይ..0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 703 ይዝለሉ**
702	ለጥያቄ ቁጥር 701 መልስዎ አዎ ከሆነ ፤ ባለቤትዎ/ ጓደኛዎ ምን ያህል ግዜ ሲጋራ ያጨሳሉ በየቀኑ፣ በሳምንት ጥቂት ግዜ፣ አልፎ አልፎ?	በየቀኑ..1 በሳምንት ጥቂት ግዜ.......................2 አልፎ አልፎ..3	
703	ባለቤትዎ/ ጓደኛዎ አልኮል ይጠጣሉ?	አዎ...1 አይ...0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 705 ይዝለሉ**
704	ለጥያቄ ቁጥር 703 መልስዎ አዎ ከሆነ ፤ ባለቤትዎ/ ጓደኛዎ ምን ያህል ግዜ አልኮል ይጠጣሉ በየቀኑ፣ በሳምንት ጥቂት ግዜ፣ አልፎ አልፎ?	በየቀኑ..1 በሳምንት ጥቂት ግዜ..................2 አልፎ አልፎ.................................3	
705	ባለቤትዎ/ ጓደኛዎ ሺሻ (Shisha) ያጨሳሉ?	አዎ...1 አይ...0	**መልሳቸው አይ ከሆነ ወደ ጥያቄ ቁጥር 707 ይዝለሉ**
706	ለጥያቄ ቁጥር 705 መልስዎ አዎ ከሆነ ፤ ባለቤትዎ/ ጓደኛዎ ምን ያህል ግዜ ሺሻ ያጨሳሉ በየቀኑ፣ በሳምንት ጥቂት ግዜ፣ አልፎ አልፎ?	በየቀኑ..1 በሳምንት ጥቂት ግዜ..............................2 አልፎ አልፎ.......................................3	
707	ባለቤትዎ/ ጓደኛዎ ጫት ይቅማሉ?	አዎ...1 አይ...0	**መልሳቸው አይ ከሆነወደ ጥያቄ ቁጥር 801 ይዝለሉ**
708	ለጥያቄ ቁጥር 707 መልስዎ	በየቀኑ..1	

	አዎ ከሆነ ፤ ባለቤትዎ/ ጓደኛዎ ምን ያህል ግዜ ጫት ይቅማሉ በየቀኑ፣ በሳምንት ጥቂት ግዜ፣ አልፎ አልፎ?	በሳምንት ጥቂት ግዜ....................2 አልፎ አልፎ.......................................3	

ክፍል 8፡ በቤት ውስጥ ለጭስ ከመጋለጥ ጋር የተያያዙ ጥያቄዎች

በቤት ውስጥ ለጭስ ከመጋለጥ ጋር የተያያዙ ጥያቄዎችን ልጠይቅዎት።

ጥ. ቁጥር	ጥያቄዎች	አማራጭ መልሶች	ወደጥያቄ...ይዝለሉ
801	አብዛኛውን ግዜ ምግብ የሚያበስሉበት ቦታ የት ነው?	በመኖሪያ ቤት ውስጥ............................1 ከመኖሪ ቤት ውጭ ባለ የተለየ ክፍል ውስጥ...2 ከቤት ውጭ ባለ ቦታ..............................3 ሌላ ከሆነ ይጠቀስ_______________..........96	
802	ምግብ ለማብሰል ቤት ውስጥ ወይም የተለየ ክፍል የሚጠቀሙ ከሆነ (በጥያቄ ቁ.802 መሰረት) የማብሰያ ቦታዉ ከሚከተሉት የአየር ማናፈሻ የትኛዉ አለዉ?	መስኮት(ቀዳዳ ያለዉ ወይም የሚከፈትና የሚዘጋ).............................1 የአየር ማናፈሻ መሳርያ (የአየር ኮንድሽነር፤ፋን)......2 ከላይ የተጠቀሱት የሉትም........................3	
803	ምግብ ለማብሰል በዋናነት የሚጠቀሙበት የሀይል ምንጭ (ነዳጅ) ምንድ ነው?	ኤሌክትሪክሲቲ.................................1 የተፈጥሮ ጋዝ/ባዮጋዝ.......................2 ኬሮሲን...3 ከሰል...4 እንጨት...5 ገለባ/ጅፎች/ሳር...................................6 የግብርና ምርት(ገለባ).............................7 የከብቶች ፍግ/አዛባ...................................8 በቤት ውስጥ ምግብ አይበስልም...9 ሌላ ከሆነ ይጠቀስ__________.........96	

ክፍል 9፡ በእርግዝና ወቅት ከእናቶች ጤና እና የህይወት ገጠመኝ ጋር የተያያዙ ጥያቄዎች

የሚቀጥሉት ጥያቄዎች በአብዛኛው ሴቶች ላይ የሚደርሱና የእርስዎም የትዳር አጋርዎ/ ጓደኛዎ በእርስዎ ላይ የሚፈጽሚቸው ጉዳዮች ሊሆኑ ይችላሉ። ስለዚህም በቀጣይ የምጠይቅዎ ባለቤትዎ/ጓደኛዎ **በእርግዝናዎ ወቅት** በእርስዎ ላይ አድርሶብዎት ከነበረ እንዲነግሩኝ እጠይቀዎታለሁ።

ጥ. ቁጥር	ጥያቄዎች	አማራጭ መልሶች	ወደ ጥያቄ-ይዝለሉ

		ሀ)መልሳቸው አዎ ከሆነ ወደ **ለ** ይቀጥሉ		**ለ**)መልስዎ አዎ ከሆነ ፤ በእርግዝናዎ ወቅት ይህ ሁኔታ **አንድ ግዜ ፣ ጥቂት ግዜ ወይስ ብዙ ግዜ** ገጠመዎት?			
		አዎ	አይ	አንድ ግዜ	ጥቂት ግዜ	ብዙ ግዜ	
901	ባለቤትዎ /ጓደኛዎ በአሁኑ እርግዝናዎ ወቅት… 1. በጥፊ ይመታወት ወይም ሊጎዳዎ የሚችል ነገር በእርስዎ ላይ ይወረዉር ነበር?	1	0	1	2	3	
	2. ይገፈትርዎ ነበር?	1	0	1	2	3	
	3. በቦክስ ወይም ሊጎዳዎ በሚችል ነገር ይመታዎ ነበር?	1	0	1	2	3	
	4. ይረግጥዎ፣ ይጎትትዎ፣ ይደበድብዎ ነበር?	1	0	1	2	3	
	5. ሆን ብሎ አንቅዎት ወይም አቃጥሎዎት ነበር?	1	0	1	2	3	
	6. በጠመንጃ ፣ በስለታም ነገር (በጩቤ) ፣ በጦር መሳሪያ ዝቶብዎት/ጎድቶዎት ነበር?	1	0	1	2	3	
902	ባለቤትዎ /ጓደኛዎ በእርግዝናዎ ወቅት… 1. እርስዎ ሳይፈልጉ ሀይል በመጠቀም የግብረ ስጋ ግንኙንት እንዲያደርጉ አስገድዶዎት ነበር?	1	0	1	2	3	
	2. እርስዎ ሳይፈልጉ ባለቤትዎን/ጓደኛዎን በመፍራት ብቻ የግብረ ስጋ ግንኙነት ይፈጽሙ ነበር?	1	0	1	2	3	
	3. እርስዎን የሚያሳፍር ወይም የሚያዋርድ የሆነ ወሲባዊ ድርጊት ሀይልን በመጠቀም እንዲፈጽሙ ያስገድድዎ ነበር?	1	0	1	2	3	
903	ባለቤትዎ /ጓደኛዎ በእርግዝናዎ ወቅት… 1. ይሰድብዎ ወይም ስለራስዎ መጥፎ ስሜት እንዲሰማዎ ያደርግ ነበር?	1	0	1	2	3	
	2. በሌሎች ሰዎች ፊት ያሸማቅቅዎ ወይም ያዋርድዎ ነበር?	1	0	1	2	3	
	3. ሆን ብሎ የሚያስፈራዎትን ድርጊት ለምሳሌ ወደ እርስዎ በሚያሳዩት አስትያየት፣ በመጮህ ወይም እቃዎችን በመሰባበር ያስፈራራዎ ነበር?	1	0	1	2	3	
	4. እርስዎን ወይም የእርስዎ የሆነን ሰው ለመጉዳት ይዝትብዎ ነበር?	1	0	1	2	3	
904	ባለቤትዎ /ጓደኛዎ በእርግዝናዎ ወቅት… 1. ጓደኞችዎን እንዳያዩ/እንዳያገኙ ይከለክልዎ ነበር?	1	0	1	2	3	
	2. ቤተሰብዎን እንዳያገኙ ይከለክልዎ ነበር?	1	0	1	2	3	
	3. ሁሌም የት እንደነበሩ ማወቁን እንደ ግዴታ ያደርግብዎ ነበር?	1	0	1	2	3	

	4. ችላ ይልዎ ወይም በግድየለሽነት ይመለከትዎ ነበር?	1	0	1	2	3	
	5. ከሌላ ወንድ ጋር ሲያወሩ ቢመለከት ይበሳጭብዎ ነበር?	1	0	1	2	3	
	6. ብዙ ግዜ በታማኝነትዎ ላይ ተጠራጣሪ ነበር?	1	0	1	2	3	
	7. ለራስዎ የህክምና አገልግሎት ለማግኝት ሲፈልጉ ፍቃዱን እንዲጠይቁ ይጠብቅ ነበር?	1	0	1	2	3	

ስለነበረን ቆይታ እጅግ አድርጌ እያመሰገንኩ ጥያቄዬን ጨርሻለዉ።እንዳብራራሎዎት የሚፈልጉት ነገር ካለ ዝግጁ ነኝ፡፡

የመረጃ ሰብሳቢዉ ስም፡_______________ ፊርማ፡- _________ ቀን፡- _____

የተቆጣጣሪው (ሱፐርቫይዘሩ) ስም፡... ፊርማ፡.........