ADDIS ABABA UNIVERSITY

COLLEGE OF DEVELOPMENTAL STUDY

CENTER OF POPULATION STUDIES

HOUSEHOLD FOOD INSECURITY AND ASSOCIATED ADVERSE BIRTH OUTCOMES AMONG WOMEN DELIVERED IN SELECTED PUBLIC HEALTH CENTERS IN KOLFE KERANYO SUB CITY, ADDIS ABABA

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This is to certify that the thesis proposal is prepared by Bezayit Terefe entitled: **Household Food Insecurity and Associated Adverse Birth Outcomes Among Women Delivered in Selected Public Health Centers in Kolfe Keranyo Sub City, Addis Ababa** and submitted in partial Fulfillment of the requirements for the degree of Master of Science in population studies (Reproductive Health) and complies with the regulations of the university and meets the accepted Standards with respect to the originality and quality.

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Contents

List of tables

List of figures

Acronym and abbreviation

ANC Antenatal Care

AOR Adjusted Odd Ratio

DHS Demographic Health Survey

FAO Food and Agriculture Organization

HFI household food insecurity

LBW Low Birth Weight

MUAC Middle Upper Arm Circumference

PTB Preterm Birth

SD standard Deviation

SSA Sub Saharan Africa

ABSTRACT

Background: - Food insecurity is defined as lack of access to sufficient, safe, and nutritious food that meets individuals' dietary needs and preferences for an active and healthy life. It results an overall disruption of food intake or eating patterns which might lead to problem of under nutrition. The nutritional status of a mother is important, both as an indicator of her overall health and as a predictor of adverse birth outcomes for both the mother and child.

Objective: - To examine the prevalence of adverse birth outcomes and its association with household food insecurity among women delivered in selected public health centers in Kolfe Keraniyo sub city of Addis Ababa, Ethiopia.

Method: - health facility based cross sectional study design was conducted among pregnant women from April, 15 up to May 15, 2022 in Kolfe Keraniyo sub city of Addis Ababa, Ethiopia. A total of 284 eligible women was participated. Data was collected using closed ended questionnaire. Pretest was done in 5% of the sample size. Ratio and 95% Confidence Interval was calculated for each independent variable with the dependent variables and p-value <0.05 considered as statistically significant.

Result :- In this study the prevalence of adverse birth outcome and HHFIS was 21% and 40% respectively and adverse birth outcome and HHFIS was a significant positive correlation function and the determinant factor for adverse birth outcome had not antenatal care follow up (AOR=11.4, 95%CI=2.59, 50.73) and participant whose pregnancy of unplanned (AOR=3.4, 95%CI=2.94, 12.41) and participant who were a history of abortion (AOR=2.8, 95%CI=1.18, 6.42) and participant who had in secured household food level (AOR=3.8, 95%CI=1.51, 9.77) than its compartment.

Conclusion and recommendation: -The prevalence of adverse birth outcome was significantly high. for the recommendation goes to better to use family planning and reduced a planned pregnancy and also reduced abortion, assured the food security of the community by create work condition and assured women empowerment in the economic policy for the non-governmental organization specially whose vision of child birth outcome had better to work in pregnant mother food security to maintain or reduced or avoid adverse birth outcome and improve the child health

Key words: pregnant women, adverse birth outcome, house old food insecurity

CHAPTER ONE

1. INTRODUCTION

1.1 Background

According to a recent estimate by the FAO, approximately 870 million people worldwide are undernourished, with 27% of these affected people residing in sub-Saharan African countries (1). Food security is a complex issue with a multi-dimensional concept, which is based on multiple dimensions such as physical, social, and economic access, availability, amount, preferences for certain foods, security, and time(2).

The measurement of food insecurity at any given time captures one if not more of the three dimensions of food security: availability, utilization, and access. The food insecurity assessment based on the availability dimension is widely used and for the most part guides the responses to food insecurity (3).

Food insecurity is defined as lack of access to sufficient, safe, and nutritious food that meets individuals' dietary needs and preferences for an active and healthy life. It results an overall disruption of food intake or eating patterns which might lead to problem of under nutrition. Food insecurity represents a lack of access to enough food to meet basic needs (4). It is associated with decreased nutritional status, including limitations in the quality, quantity, and/or frequency of food intake (5, 6) and food preferences for sustained existence (7).

Food insecurity remains a public health threat worldwide and it is widespread in developing countries, as millions of people continue to suffer from food scarcity and death due to food insecurity in these countries. According to FAO report, the prevalence food insecurity worldwide in 2018 was as high as 10.2%, and the vast majority (98%) coming from the developing countries and the highest proportion (30%) arise from sub-Saharan Africa (8).

A number of health outcomes have been affected by inadequate access to food. It is related with self-reported health status among adult and children and depression and anxiety in mothers (9-11). Food insecurity as is characterized by limited or uncertain availability of nutritionally adequate foods, it can also prevent many pregnant women from meeting the necessary

requirements for healthy eating during pregnancy. Prior research suggests that food insecurity during pregnancy is associated with low gestational weight gain, pregnancy complications, and increased risk of certain birth defects, low birth weight, premature deliveries still birth and neonatal mortality (12-15).

The current literature provides a substantial amount of evidence for an adverse association between food insecurity and diet. Food insecure children and adults tend to consume diets of lower quality, have less healthy eating behaviors, and have lower intakes of produce can lead to poor fetal growth, low birthweight (LBW) and short- and long-term infant morbidity and mortality.

1.2 Statement of the problem

The proportion of women who are malnourished in selected sub-Saharan African (SSA) countries for which a DHS was recently conducted ranges from 7 to 37% (11). As a country in SSA, Ethiopia also has the highest proportions of undernourished women (16). It is the most food-insecure countries in Africa, and has long history of famines and food shortages. It has been estimated that more than half of the African's food-insecure population lives in Ethiopia and six other countries (17).

The nutritional status of a mother is important, both as an indicator of her overall health and as a predictor of pregnancy outcome for both the mother and child (18). Evidences suggest that food insecurity has been associated with intrapartum depression and anxiety among mothers. Pregnant women experiencing depressive symptoms are known to have high risk for dysfunctional placentation and intrauterine growth restriction, which affect birth outcomes such as preterm birth and low birth weight for gestational ages (19-21).

However, the impact of household food insecurity (HFI) on pregnancy or birth outcomes is not well-established and the association has been found inconsistent in most of the previous studies. There are also very few studies conducted in HFI and birth outcome interlink in Ethiopia, particularly in Addis Ababa. In literatures, there is not any study assessed adverse birth outcome with household food insecurity using HHFIAS, in the study area even the country at large. Therefore, this study aims to determine the magnitude of adverse birth outcomes and to examine its association with household food insecurity by using HHFIAS in Addis Ababa, Ethiopia.

1.3 Significance of the study

The findings of this result are important to design appropriate policies, programs and strategies to address the vulnerabilities to household food insecurity and reduce associated adverse birth outcomes among pregnant women. It contributes in the design of prevention strategies of adverse birth outcome among this population. The finding of this study would also add to the existing base of knowledge on the determinant of adverse birth outcome specially related with maternal undernutrition.

CHAPTER **TWO**

3. OBJECTIVE

3.1 General objective

To examine the prevalence of adverse birth outcomes and its association with household food insecurity among women delivered in selected public health centers in Kolfe Keraniyo sub-city of Addis Ababa, Ethiopia.

3.2 Specific objective

1. To determine the prevalence of adverse birth outcomes among women delivered in selected public health centers in Kolfe Keraniyo sub-city of Addis Ababa, Ethiopia.

2. To identify the relationship between household food insecurity and adverse birth outcome among women delivered in selected public health centers in Kolfe Keraniyo sub-city of Addis Ababa, Ethiopia

CHAPTER THREE

3. 1 CONCEPTUAL LITERATURE REVIEW

Food insecurity represents a lack of access to enough food to meet basic needs .it hypothesized that food insecurity may increase birth defect risks, because it is an indicator of increased stress or compromised nutrition, which are both implicated in birth defect etiologies.

3.1.1 prevalence of adverse birth outcomes

Predictors of adverse birth outcomes among pregnant adolescents in Ashanti Region, Ghana showed that preterm births (PTBs) decreased with increasing education level (none = 40 %; SHS = 11·5 %). older adolescents (16–19 years) recorded more PTBs (13·1 %) than adolescents in the younger bracket (5 %). PTB's were recorded among adolescents who were married (19·4 %) and employed (16·9 %) than among those who were single (13·8 %) and unemployed (10·9 %). LBWs were proportionally higher among adolescents who were younger than their older counterparts (22·2 % v. 14·8 %), married than single (19·4 % v. 13·8 %), employed than unemployed (16·9 % v. 15·6 %) and among those with high income range than those without income (33·3 % v. 13·6 %) (22).

The study finding in Asaita district on Household Food Insecurity and the Underweight Status, and Associated Characteristics showed that the prevalence of underweight was 41.1% (23).

Determinants of Low Birth Weight Among Women Who Gave Birth at Public Health Facilities in North Shewa Zone showed that twenty (10.8%) of cases and 33 (8.9%) of controls faced abortion. Half, 62 (50.4%), of cases and 42 (17%) of the controls had a history of adverse birth outcomes. Twenty-nine (23.77%) of cases and 10 (4.5%) of the controls had LBW history. Near to three-fourths, 135 (73%) of cases and 344 (93%) of controls, had ANC visits in their recent pregnancy (24).

3.2 household food insecurity

The study finding in Asaita district on Household Food Insecurity and the Underweight Status showed that the mean Household Food Insecurity Access Scale score was 7.0 (±3.6 SD). Nearly one-fifth of households, 14.1%, experienced severe food insecurity, while 30.2% and 26.1% households had moderate and mild food insecurity, respectively. 7.8% of households reported

eating fewer meals in a day or had family members that go to sleep at night hungry or complained of no food to eat in the last 30 days prior to the survey (23).

Study done in Addis Ababa on Food insecurity and other possible factors contributing to low-birth-weight showed that the mild food insecurity in the case group 12.93% was higher than the control group 5.11% Moderate food insecurity in the case and control groups was found to be 14.65% and 3.13%, respectively. Severe food insecurity was 2.59% and 0.28% in the case group and the control group, respectively (25).

Study done Effect of Food Insecurity showed that all mothers who participated in this study were assessed for their household food insecurity status. reported that their household did not have enough food, 26 cases (35.6%) and 38 controls (17.4%). 95 mothers (32.5%) were food insecure, 39 cases (53.4%) and 56 controls (25.6%). 55 (57.9%), were mildly food insecure, 19 cases (48.7%) and 36 controls (64.3%); 32 (33.7%) were moderately food insecure, 13 cases (33.3%) and 19 controls (34%); and eight (8.4%) (18% cases and 1.8% controls) were severely food insecure (26).

3.3 The association of house hold food insecurity and adverse birth outcomes

The study finding in Asaita district on Household Food Insecurity and the Underweight Status showed that women who belong to the age group of 15–19 years compared with those who belong to the age group of 30–39 years had less odds of underweight (AOR = 0.10). Relative to the odds of underweight among married women, women that were never married had more than 8 times higher odds of being underweight (AOR = 8.58). Unlike women with ≥5 children ever born (parity), women with 1-2 children ever born (parity) were less likely with two or more children below five years of age had significantly more than 9 times higher odds of underweight compared with those who had no children below five years of age (AOR = 9.27) (23).

Study done in Addis Ababa on Food insecurity and other possible factors contributing to low-birth-weight showed that the mothers having food insecurity [adjusted odd ratio (AOR) 3.58; 95% confidence interval, mid upper arm circumference [AOR 7.70), hypertension [AOR 4.81), and early age [AOR 3.88) showed statistically significant association with low birth weight (25).

Determinants of Low Birth Weight Among Women Who Gave Birth at Public Health Facilities in North Shewa Zone showed that mothers who had no nutritional counseling had 2.14-folds higher odds of delivering LBW newborn compared to those who had nutritional counseling (AOR, 2.14). Mothers who did not take iron-folate supplementation had 3.78 higher odds of giving LBW newborn compared to their counterparts (AOR, 3.78). Mothers who did not take additional food had 7-folds higher odds of giving LBW newborn compared to their counterparts (AOR, 6.93). Mothers who were restricted to eat some foods had 2.29-folds higher odds delivering LBW newborn compared to their counterparts (AOR, 2.29). Mothers who had MUAC <23 cm had 2.85-folds higher odds of delivering LBW newborn compared to those who had MUAC ≥23 cm (AOR, 2.85). Women whose height was ≤155 cm had 3.58-folds higher odds of delivering LBW newborn compared to their counterparts (AOR, 3.58). Anemic women had 2.34-folds higher odds of giving LBW newborn than non-anemic women (AOR, 2.34). The odds of giving LBW newborn were 3.39 folds higher among women who had pregnancy-related complication compared to their counterparts (AOR, 3.39). Women who drank alcohol had 2.25-folds higher odds of delivering LBW babies compared to their counterparts (AOR, 2.25) (24).

Study done on Effect of Food Insecurity showed that the mother living in a food-insecure household (AOR = 2.9), uneducated mother (AOR = 5), birth interval of <24 months (AOR = 4.6), age at first birth of <18 years (AOR [95% = 4), late initiation of antenatal care (ANC) (AOR = 4.4), pregnancy induced hypertension (AOR = 3.6), and maternal mid-upper arm circumference (MUAC) of <23 cm (AOR = 11) were predictors of low birth weight (26).

Pregnant adolescents who used insecticide-treated net (ITN) presented reduced odds (AOR 0·4) of giving birth to babies with LBW compared with those who did not use them. Maternal morbidity increased odds (AOR 2·7) of babies with LBW as compared with those who did not experience any sickness. Maternal education status and maternal morbidity were significantly associated with delivering PTB. Pregnant adolescents with no formal education presented increased odds (AOR 9·0) of having PTB compared with those with formal education. Adolescents who suffered hunger had increased odds (OR 2·9) for PTB, compared with those who were not hungry. Poorer pregnant adolescents presented increased odds (OR 2·5) of delivering preterm babies than those who were not poor. Experiencing maternal morbidity

increased the odds (AOR 3·0) of having PTB as compared with those who did not experience any form of morbidity (22).

Prevalence of food insecurity in pregnant women and its association with gestational weight gain pattern, neonatal birth weight, and pregnancy complications in Hamadan County showed that the weight gain in the food-insecure group with severe hunger was 1.52 kg lower than the food-secure group. A comparison of gestational diabetes mellitus among the food security groups indicated a significant relationship between the food security status of pregnant women and the gestational diabetes mellitus rate (P = 0.03). The rates of OR revealed that the probability of gestational diabetes in the food-insecure group without hunger and the food-insecure group with moderate hunger were 56% and 61% lower than the food-secure group, respectively, but this rate was 52% higher in the food-insecure group with severe hunger than the food-secure group (27).

3.4 Conceptual framework

The conceptual framework was adopted from the literature by the author and it has three components. That is food security assessment using HHFIAS measurement, sociodemographic characteristics of the participants and obstetric characteristics of the study participants

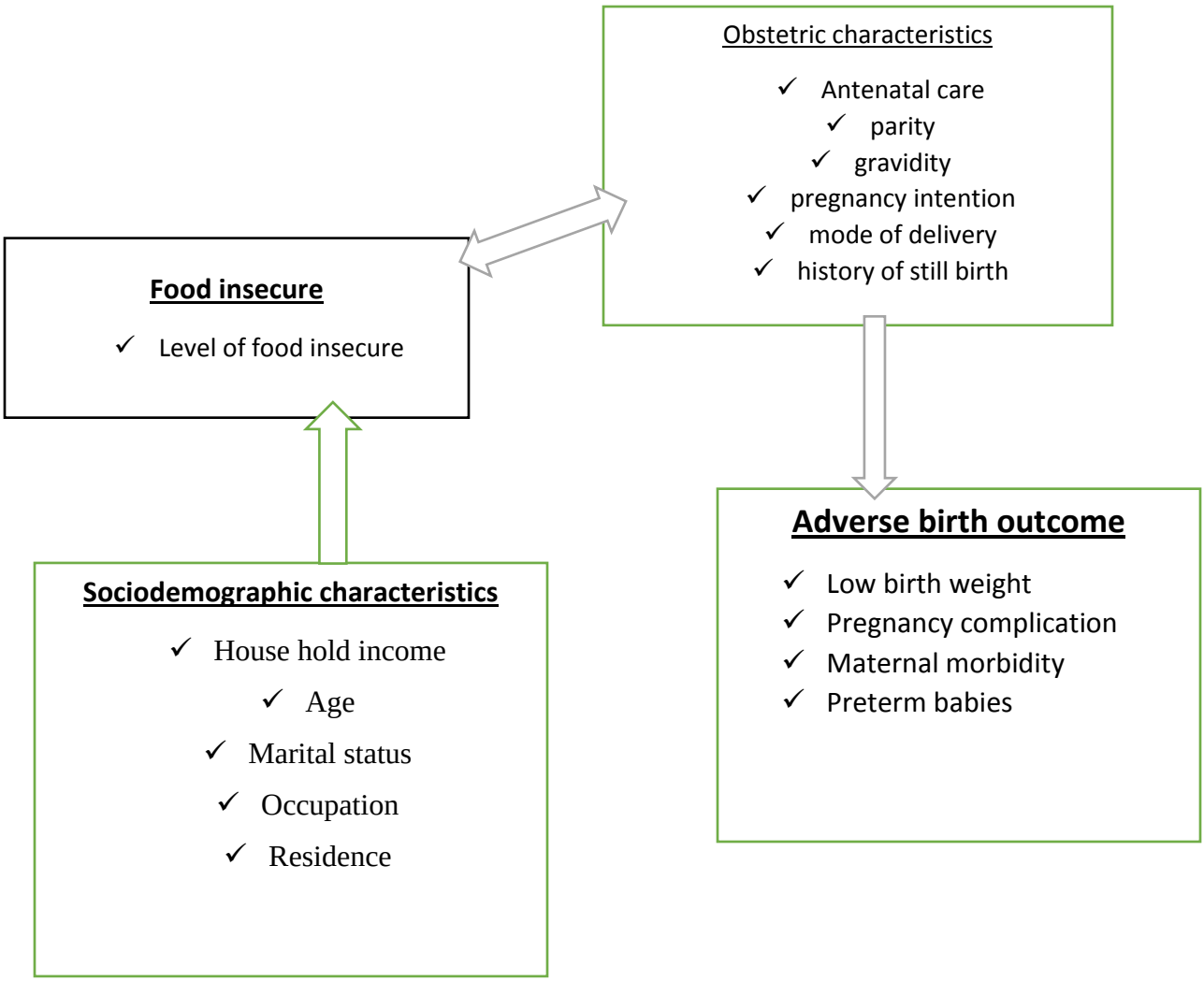

Figure 1.conceptual framework was adopted from the literature by the Author (22-27)

CHAPTER FOUR

4. METHODS AND MATERIALS

4.1. Study area

The study was conducted in Kolfe Keranyo sub city which is one of the eleven sub cities of Addis Ababa, the capital city of Ethiopia. Kolfe Keranyo sub city is selected due to having more population size, higher number of reproductive age women and heterogeneous ethnic group (28). The sub city is found in the western part of Addis Ababa. Administratively, the sub city is divided in to 16 woredas. According to the sub city health office 2021, the total population of the sub city is estimated to be around 576,443. The sex ratio shows 49% are males and 51% are females. The estimated numbers of pregnant women are 23,154 regarding to the office report..

The sub city has health service access in less than 2 kilometers. There are 1 hospital under Ministry of health and 3 Private Hospitals in the sub city. The sub city also has 11 functional public health centers and more than 176 private clinics.

All health centers in the sub city give antenatal care services for the public. The estimated number of women who gave birth in the health centers is 11040 in a year. According to the information obtained from the health centers, the average number of pregnant mothers giving birth in a month is estimated at 920.

4.2. Study design and period

Facility based cross-sectional study design was employed from April, 15 up to May 15, 2022 in public health centers of kolfe keranyo sub city of Addis Ababa.

4.3. Source Population

All mothers who gave birth in public health centers of kolfe keranyo sub city of Addis Ababa

4.4. Study population

All mothers who gave birth in selected public health centers of kolfe keranyo sub city of Addis Ababa

4.5 Eligibility criteria

4.5.1. Inclusion Criteria

All mothers who gave birth in the selected public health centers of kolfe keranyo sub city of Addis Ababa just prior to discharge.

4.5.2. Exclusion criteria

Mothers who are critically ill and unable to communicate at the time of data Collection.

Mothers who had known medical problem like GDM, Anemia

4.6. Sample size determination

For objective one: -The sample size required for this study was calculated based on a single population proportions formula as follows.

$$n = \frac{(Z\ \alpha/2)2\ P\ (1-P)}{d2}$$

Where: n is sample size; Z α/2 is standard normal distribution corresponding to significance level at α = 0.05 , which is 1.96 ;d is margin of error assumed to be 5%, and the proportion of adverse birth outcomes, P=23% (21).

Therefore, n= (1.96)2 x 0.23(1-0.23)/ (0.05)2=272

Sample size for objective two: - the other sample was calculated using a double proportion formula using the following assumptions.

$$n = 2\ (Z\ \alpha/2 + Z\ \beta\ )2\ p\ (1 - P)2\ /\ (P1 - P2)2$$

Where n is the sample size, Z α/2 = 1·96 at type 1 error of 5 %, Z β = 0·84 at 80 % power, P1 is the prevalence of LBW in mothers with insecure household food status during pregnancy, P2 is the prevalence of LBW in mothers with secured household food status, P1 − P2 is the difference, and P is pooled prevalence = (P1 + P2)/2

Considering P2=20.1% and P1=53.8% (25), and a pooled prevalence of

(P)= (0.201+0.538)/2=0.369=36.9%, the minimum sample size will be

n=2(1.96+0.84)2 0.369(1-0.369)2/ (0.538-0.201)2 =64

Therefore, the larger sample size from the two alternatives of sample size calculation; i.e., n=272 was considered, and after adding 10% non-response rate the final sample size will be 295.

4.7 Sampling Procedure

Kolfe Keraniyo sub city has eleven health centers and the calculated sample size was proportionally allocated to these heath centers based on the number of clients who have been giving births for the last one year. Recruitment of study subjects for the study was made using consecutive sampling in which the participants were identified/recruited immediately after delivery and the recruitment continues until the allocated sample size for each health centers was fulfilled.

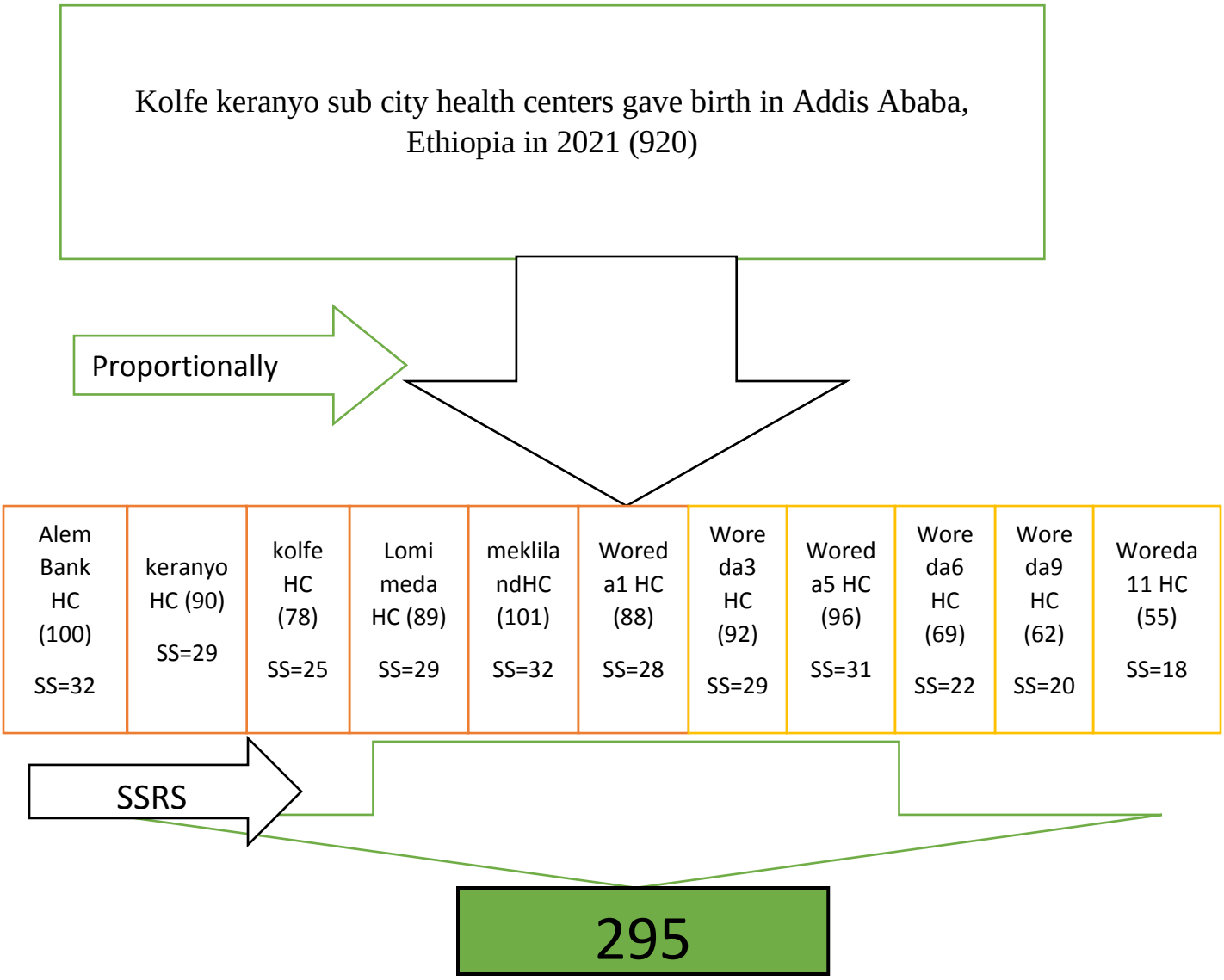

Figure 1. Schematic presentation of sampling techniques for participants who give birth in kolfe kernyo sub city selected public health centers, Addis Ababa, Ethiopia.

4.8 Study Variables and measurement

4.8.1 Dependent variable

Adverse birth outcomes (low birth weight, preterm birth and perinatal mortality)

"Adverse birth outcome" is considered to happen if any of LBW, PTB or perinatal mortality has been occurred to the woman who gave birth in the selected public health centers. On the other hand, if any of these events is not occurring, then the birth outcome is considered to be "normal birth outcome"

4.8.2 Independent Variables

- ✓ The primary exposure/predictor variable for the study is Household Food Insecurity (HFI)

Socio demographic characteristics including:

- ✓ Age
- ✓ Marital Status
- ✓ Income
- ✓ Parity
- ✓ Educational Status of the mother

Reproductive and Obstetric Characteristics including

- ✓ History of fetal loss
- ✓ ANC attendance
- ✓ Pregnancy intendedness/planning
- ✓ Gravidity
- ✓ Parity
- ✓ Mode of deliveries

4.9 operational definition

Household food insecurity is a lack of consistent access to enough food for an active, healthy life, Hunger refers to a personal, physical sensation of discomfort, while food insecurity refers to a lack of available financial resources for food at the household level. And household food

insecurity will be measured by the nine questions of the Household Food Insecurity Access Scale (19).

Q1. Worry about food

Q2. Unable to eat preferred foods

Q3. Eat a limited variety of foods

Q4. Eat foods that you really did not want to eat

Q5. Eat a smaller meal

Q6. Eat fewer meals in a day

Q7. No food to eat of any kind in the household

Q8. Go to sleep at night hungry

Q9. Go a whole day and night without eating anything

Adverse birth outcome: - In this study adverse birth outcomes includes premature deliveries, low birth weight deliveries and, perinatal mortality

Low birth weight: The weight of the newborn < 2.5 kg.

Premature Delivery: Babies born less than 37 weeks of gestation.

Perinatal Mortality: Perinatal mortality is defined as fetal deaths after 28 completed weeks of pregnancy (i.e., stillbirth) and newborn **deaths up** to 7 completed days of life.

4.10 Method of data collection

A structured questionnaire was used to gather data in a face –to- face interview. The questionnaire was taken from different literatures and modified and was pretested in a health facility outside of the study area. It was first prepared in English and translated in to Amharic language by translator, and then translated back to English by a third person to check for consistency.

The data was gathered by 11 diploma midwife and supervised by 1 health officer professionals. Both data collectors and supervisors were trained for 1 day about the contents of the questionnaire and on how to collect the data properly in order to minimize errors. Principal investigator and supervisors were present on the spot to check and review all the completed questionnaires; and to ensure completeness and consistency of the information collected.

The data was collected when the women come to the selected health facilities to get delivery services and after the pregnancy is ended. For those women who experience perinatal death (still birth or early neonatal mortality) data collectors approached the women with utmost politeness to administer the interview.

However, if the women are unwilling to communicate in this time of mourning (as a result of loss of her baby), the supervisor communicated her or any member of the family to get phone number or her address, and then arranged to visit her at home for interview at other convenient time. For those women whose pregnancy was ended with live birth, the data collector was collecting the birth size and gestational ages from the mother's health service record.

4.11 Data quality control

All of the questionnaires were checked for completeness and accuracy before the period of data collection. Throughout the course of the data collection, interviewers were supervised, regular meetings were held between the data collectors and the principal investigator together in which problematic issues arising from interviews during the data collection and mistakes found during editing will be considered. The collected data has been again reviewed and checked for completeness before data entry. Data entry format template was prepared and programmed by principal investigator.

4.12Data analysis and interpretation

The collected data was checked manually for completeness and any incomplete or misfiled questions was sent back to the field so that any further correction will be made through re-interviewing. Then, the clean and complete data was entered and analysis was made by using SPSS version 25.0 software. Descriptive statistics were done and presented using tables and figures. Initially, bivariate logistic regression was carried out to see the association of each of the independent variables with the outcome variable.

To examine the association of HFI and birth outcomes, the multivariable logistic regression was performed to control possible confounders. The variables that was not show significant association with the outcome (adverse birth outcome) in the bivariate logistic regression at $p<0.25$ was not considered for the multivariable logistic regression analysis. P- Value of <0.05

and 95% confidence level was used as a difference of statistical significance in the multivariable analysis. Odds ratio with 95% confidence interval was reported as a measure of association.

4.13 Ethical consideration

Ethical clearance was first obtained from Addis Ababa university, college of developmental study and Addis Ababa public health research and emergency management directorate institutional review board. Then, the ethical clearance and support letter was taken to the selected health centers to obtain permission and cooperation during the data collection process.

Informed oral consent was obtained from each study subject prior to the data collection process after the purpose of study has been explained and they become briefed about the confidentiality of their responses and the importance of providing the right information to help the study achieve its objective.

All participants were asked for their willingness to participate in the study and will be told that it was not have any risk on them. Confidentiality of the information will be assured and privacy of the respondent will be maintained.

CHAPTER FIVE

5. RESULT

5.1 Sociodemographic characteristics

In this study 284 participants were involved making a response rate of 96.3%. About half of the participants (51.1%) were in the age group of 25-34 years with mean and SD of 28.1±5.45. The study participants were predominantly orthodox by religion (42.3%), housewife by occupation (55.6%), married (69%) in their marital status, and were at primary level of education (54.9%)

Table 1. The sociodemographic characteristics of give birth in public health centers of kolfe keranyo sub city of Addis Ababa

Variable	Frequency	Percent
Age the study participants(in years)		
≤24	97	34.2
25-34	145	51.1
≥35	42	14.8
Religion of the study participants		
Orthodox	120	42.3
Catholic	24	8.5
Protestant	61	21.5
Muslim	79	27.8
Marital status		
Single	10	3.5
Married	196	69.0
live with partner	54	19.0
Divorce	24	8.5
Educational status		
no read and write	7	2.5
Primary	156	54.9
Secondary	63	22.2
college and above	58	20.4
Occupation of the women		
house wife	158	55.6
government employee	43	15.1
private employee	34	12.0
Merchant	40	14.1
daily labor	9	3.2
Monthly household income		
<1600	96	33.8
1601-3200	112	39.4
3201-5250	24	8.5

5250-7800	6	2.1
7801-10900	15	5.3
>10900	31	10.9

5.2 Obstetric characteristics of the study participants

Concerning the obstetric characteristics, two-third of the participants (66.2%) were multiparous and great majority (87%) had antenatal care follow up and delivered vaginally (84.2%). About three-fifth of them (59.5%) stated their current pregnancy was planned and few mentioned they had history of still birth (8.5%). One-fifth (19.5%) of the participants reported they had history of abortion.

Table 2. Obstetric characteristics of the study participants

Variable	**frequency**	**Percent**
Number of pregnancies in the life time		
Primigravida	89	31.3
Multipara	188	66.2
Grand multipara	7	2.5
Antenatal care follows up for this pregnancy		
Yes	247	87.0
No	37	13.0
Mode of delivery		
SVD	239	84.2
C/S	45	15.8
Have you an planned this pregnancy		
Yes	169	59.5
No	115	40.5
Have you ever history of still birth		
Yes	24	8.5
No	260	91.5
Have your history of abortion		
Yes	56	19.7
No	228	80.3

5.3 Magnitude of Adverse Birth Outcomes

In this study, 20.8% of the birth has an adverse birth out come as shown in the figure below.

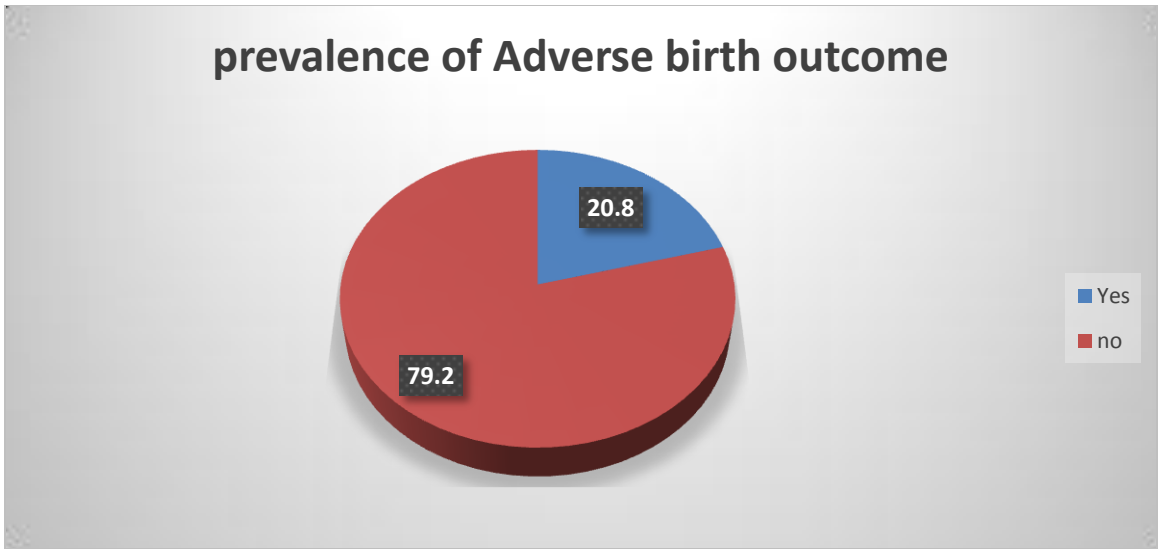

Figure 2. The prevalence of adverse birth outcome

Ninety eight percent of the delivery was live births and 94% was an APGAR score of>7 with in five minute of after delivery and 82.4% were normal birth weight.

Table 3. Condition/characteristics of Birth Outcomes among women who gave birth in selected health centers of Kolfe Keraniyo sub city, Addis Ababa, Ethiopia, 2021

variable	Frequency	Percent
current Survival status of the new born		
alive	278	97.9
dead	6	2.1
Preterm birth		
Yes	37	13.1
No	247	86.9
condition of the neonatal death		
still birth	4	66.7
early neonatal death	2	33.3
APGAR at one minute		
0	6	3.5
1-6	21	6.0
>=7	257	90.5
APGAR at one minute		
0	4	1.4
1-6	13	4.6
>=7	267	94.0
Weight of the new born		
<1500	3	1.1
1500-2499	42	14.8
2500-3999	234	82.4
≥4000	5	1.8

5.4 Prevalence of household food insecurity

The overall prevalence of HHFI among women who involved in this study was 40% as shown in the figure below.

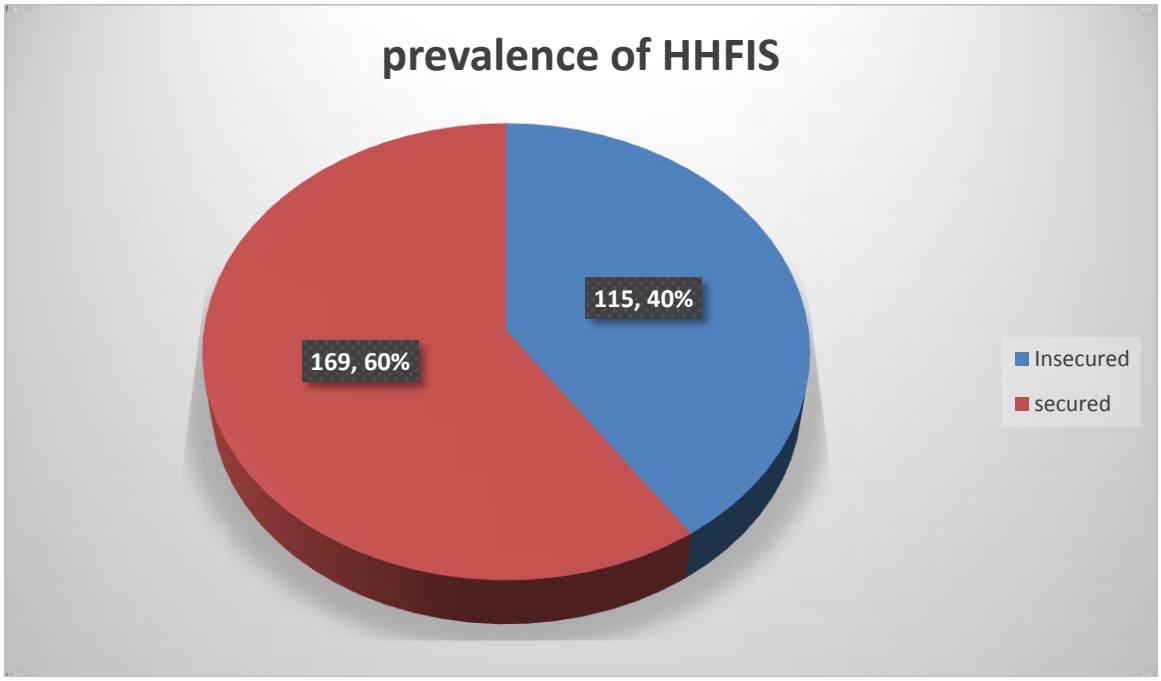

Figure 3. The participants characteristics on household food insecurity

Regarding to the specific food insecurity measurement, 26.1% the participants were worry about food, 45.8% were unable to eat preferred food and 48.9% were eat limited variety of foods.

Table 4. the study participants characteristics on household food insecurity

variable	frequency	Percent
Worry about food		
Yes	74	26.1
no	210	73.9
Unable to eat preferred foods		
Yes	130	45.8
no	154	54.2
Eat a limited variety of foods?		
Yes	139	48.9
no	145	51.1
Eat foods that you really did not want to eat		
Yes	143	50.4
no	141	49.6
Eat a smaller meal		
Yes	147	51.8
no	137	48.2
Eat fewer meals in a day		
Yes	100	35.2
no	184	64.8
No food to eat of any kind in the household		
Yes	108	38.0
no	176	62.0
Go to sleep at night hungry		
Yes	97	34.2
no	187	65.8
Go a whole day and night without eating anything		
Yes	118	41.5
no	166	58.5

5.5 The correlation function test of Adverse birth outcome vs HHFIS

The correlation function showed stat adverse birth outcome and HHFIS had a significant positive relation. The mean as HHFIS score increase the prevalence of adverse birth outcome also increase.

Table 5. The correlation function test of Adverse birth outcome vs HHFIS

Correlations		HHFIS	
Adverse Birth outcome	Pearson Correlation	1	0.678**
	Sig. (2-tailed)		.003
	N	284	284
**. Correlation is significant at the 0.01 level (2-tailed).			

5.6 Household food Insecurity and its association with Adverse birth outcome

In the bivariate analysis, the variables HHFI, age of the participants, ANC follow up, planned pregnancy and history of abortion showed association with the outcome variable at P≤0.25, in which these five variables were considered as candidate for the multivariable analysis.

Consequently, in the multivariable analysis, the odds of adverse birth outcomes among food unsecured households were 3.8 times higher than those households with secured food status (AOR=3.8, 95%CI=1.51, 9.77), controlling for the possible confounders. No antenatal care follows up (AOR=11.4, 95%CI=2.59, 50.73), having unplanned pregnancy (AOR=3.4, 95%CI=2.94, 12.41) and history of abortion (AOR=2.8, 95%CI=1.18, 6.42) also showed positive association with adverse birth outcomes.

Table 6. Results of the bivariate and multivariate logistics regression analysis

Variable	**Adverse birth outcome**		p-value	COR (95%CI)	p-value	AOR (95%CI)
	yes	no				
HHFIS level						
secured	28(47.5%)	141(62.7%)	1			
insecure	31(52.5%)	84(37.3%)	0.036	1.9(1.04, 3.31)	0.005	**3.8(1.51, 9.77)**
Age of the study participants						
<24	13(22%)	84(37.3%)	1			
25-34	35((59.4%)	110(48.9%)	0.043	2.1(1.02, 4.13)	0.239	1.8(0.67, 5.11)
>=35	11(18.6%)	31(13.8%)	0.072	2.3(0.93, 5.65)	0.312	1.8(0.59, 5.31)
Antenatal care follow-up						
Yes	36(61%)	211(93.8%)	1		1	
no	23(39%)	14(6.2%)	0.000	9.6(4.54, 20.44)	0.000	**11.4(2.59, 50.73)**
Planned pregnancy						
Yes	19(32.2%)	150(66.7%)	1			
no	40(67.8%)	75(33.3%)	0.000	4.2(2.28, 7.78)	0.000	**3.4(2.94, 12.41)**
Had history of abortion						
Yes	19(32.2%)	37(16.4%)	0.008	2.4(1.26, 4.62)	0.019	**2.8(1.18, 6.42)**
no	40(67.8%)	188(83.6%)	1		1	

CHAPTER SIX

6. DISCUSSION

Birth outcomes measures health at birth. These outcomes determine whether a child has a healthy start, or may have current and future health problems. Certain health conditions, social and economic factors, and behaviors can increase the risk of poor reproductive and birth outcomes. Poor pregnancy outcomes, including low birthweight, preterm births and infant mortality, are associated with household food insecurity (28).

In this study the prevalence of adverse birth outcome was 20.8%. This finding was lower than the study done in Asiata, a far (23). This difference was may be due to the sociodemographic and the health-related awareness difference of the study participants, in which the current study was conducted in Addis Ababa while the literature was done in rural part of Ethiopia and this area was highly starved area.

In this study the prevalence of HHFI was 40% according to the Household Food Insecurity Access Scale and food insecurity condition was a significant impact on birth outcome as evidenced the correlation function of this study. The high prevalence of food insecurity in pregnant women might affect the normal gestational growth, leading to adverse birth outcomes (29). The finding of this study revealed the validity of this association that participants in households with insecured food status showed 3.8 folds increase in having adverse birth outcome than those with secured food status (AOR=3.8, 95%CI=1.51, 9.77). This finding was in agreement with the study done in Hamadan County, Iran and study done in Addis Ababa (25, 27). This can be explained with the fact that mother is the only source of nutrition for fetal growth and thus poor maternal nutritional status (macro- and micro-nutrients) before and/or during pregnancy is therefore a potential predictor of poor fetal physical growth and adverse

birth outcomes (30). This theory was evidenced by the full-term human fetus develops from a single cell and needs nutrition from the moment of conception. The developing fetus relies primarily on the mother's placenta for energy, but it takes nearly 12 weeks until growth of the placenta is complete (30). Unlike the findings of this study adverse birth outcome was shown not to be significantly associated with HHFI in the studies of North Shewa Zone and Ashanti Region, Ghana (22, 24).

CHAPTER SEVEN

7. CONCLUSION

In this study the prevalence of adverse birth outcome and HHFIS was 21% and 40% respectively After adjusting the potential confounders (age, pregnancy planning, ANC follow up and history of abortion), HHFIS showed positive association with adverse birth outcomes. and. The other factors which showed positive association with adverse birth outcome was ANC follow up, planned pregnancy and history of abortion

8. RECOMMENDATION

The prevalence of adverse birth outcome was significantly high. There for the recommendation goes to

For the study participant: - better to use family planning and reduced a planned pregnancy and also illuminate abortion

For NGO: - for the non-governmental organization specially whose vision of child birth outcome had better to work in pregnant mother food security to maintain or reduced or avoid adverse birth outcome and improve the child health.

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ANNEX I: ENGLISH VERSION QUESTIONNAIRE

I. Information sheet

Greeting- Hello! My name is _____

This study is conducting by Bezayit Terefe, she came from Addis Ababa University College of health sciences and school of public health, department of developmental study. She has permission from the university and Regional Health Bureau. The reason why she came here is to conduct research on Household Food Insecurity and Associated Adverse Birth Outcomes Among Women Delivered in Selected Public Health Centers in Kolfe Keranyo Sub City.

The Purpose of This Study Is to Assess and Identify Household Food Insecurity and Associated Adverse Birth Outcomes Among Women Delivered in Selected Public Health Centers in Kolfe Keranyo Sub City. If you have experienced on this city (Addis Ababa) for six months and above your participation is very important to the outcome of the study. If so, you would like to participate on this self-administer questionnaire. This may take 30 minutes. All the information that you are going to provide me will remain confidential and you don't need to mention your name.

For this reason, I kindly request you to give me your sincere and truthful answer. All this is completely on voluntary bases and you have the right to refuse from participation. Participation or non-participation and refusal to answer questions will have no effect on your life. If you have further questions or would like to know the results of this study, please feel free to contact the principal investigator; with the following address.

Bezayit Terefe Cell phone: +251 912482785

II. Consent form

I have read all the process and the objective of the study and I have understood the same as written that includes informed about the purpose, advantage, and disadvantage of this study titled HOUSEHOLD FOOD INSECURITY AND ASSOCIATED ADVERSE BIRTH OUTCOMES AMONG WOMEN DELIVERED IN SELECTED PUBLIC HEALTH CENTERS IN KOLFE KERANYO SUB CITY.

I also understood that the research imposes no risk and no composition would be provided to me. I have been told that if I fill discomfort to respond to any of the question, I fill free to drop it any time wish to do so.

I have understood the information given and the participation is completely voluntary based. I have been told that my answers to the questions will not be given to anyone and not expect to write my name. Now I am giving my consent to participate in the study voluntarily.

Could I have your permission to continue?

1. Yes
2. No, Stop and thank the respondent.

Witness's signature certifying that the informed consent has been given.

Witness: Signature_____

Dated _____ Data collector:

Name_____ Signature _____ Dated_____

Result:

1. Questionnaire completed _____
2. Questionnaire partially completed _____
3. Participant refused _____
4. Others (please Specify) _____

Checked by Supervisor:

Name _____

Supervisor's Signature _____

Date _____

Part I. Sociodemographic characteristics

1. Age of the mothers in years _____
2. Marital status of the women
    I. Single
    II. Married
    III. Widowed
    IV. Divorced
3. Occupation of the women
    I. House wife
    II. Government employee
    III. Private employee
    IV. Merchant
    V. Daily labor
    VI. Other, specify
4. Education level of the women
    I. No formal education
    II. Primary
    III. Secondary level
    IV. Collage and above
5. Religion
    I. Orthodox
    II. Muslim
    III. Protestant
    IV. Catholic
    V. Missing
6. Residence of the study participants
    I. Urban
    II. Rural
7. Monthly house hold income_____

Part II. Obstetric characteristics

8. Having Antenatal care follow up

I. Yes

II. No

9. Number of pregnancies in the life time_____

10. Mode of delivery

I. SVD

II. Instrumental

III. Cesarean section

11. Gestational age of current pregnancy in week_____

Part III. Items on the Household Food Insecurity Access Scale (HFIAS)

12. Worry about food

I. Yes

II. no

13. Unable to eat preferred foods

I. Yes

II. no

14. Eat a limited variety of foods

I. Yes

II. no

15. Eat foods that you really did not want to eat

I. Yes

II. no

16. Eat a smaller meal

I. Yes

II. no

17. Eat fewer meals in a day

I. Yes

II. no

18. No food to eat of any kind in the household

I. Yes

II. no

19. Go to sleep at night hungry

I. Yes

II. no

20. Go a whole day and night without eating anything

I. Yes

II. No

Part IV. Birth Outcome

21. Perinatal outcome of the new born

I. Alive

II. Dead

22. APGAR score of the new born at one ad five minute respectively _____ and _____

23. Weight of the new born in gram_____

24. Gestational age of the new born_____

አባሪ 1፡ የአማርኛ ጥያቄ

I. የ መረጃ ቅፅ

ሰላምታ - ሰላም! ስሜነ ው_____

ይህ ጥናት የሚከሄደው ቤዛይት ተረፈ ከአዲስ አበባ ዩኒቨርሲቲ የጠፍ ሳይንስ ኮሌጅ እና የህብረተሰብ ጠፍ ትምህርት ቤት የደቨሎፕመንት ጥናት ትምህርት ክፍል ነ ው። ከዩኒቨርሲቲ እና ጠፍ ቢሮ ፈቃድ አላት። ወደዚህ የመጣቸበት ምክንያት በኮልፌ ቀራንዮ ክፍለ ከተማ በተመረጡ የሕበረተሰብ ጠፍ ጣቢያዎች የወለዱ እናቶች በቤተሰብ የምገብ ዋስትና እጦት እና ተጓዳኝ አሉታዊ የወሊድ ወጠፎች ላይ ጥናት ለሚድረግ ነ ው።

የ ዚህ ጥናት አላማ በኮልፌ ቀራንዮ ክ/ከተማ በተመረጡ የህዝብ ጠፍ ጣቢያዎች ከሚሌዱ ሴቶች መካከል የ ቤተሰብን የ ምገብ እጦት እና ተያያዥ የ ወሊድ ወጠፎችን መ ምጣ ም እና መለየ ት ነ ው። በዚህ ከተማ (አዲስ አበባ) ላይ ለ ስድስት ወራት እና ከዚያ በላይ ልምድ ካጋጠመዎት ተሳትፎዎ ለ ጥናቱ ወጠት በጣም አስፈላጊ ነ ው: ከሆነ ፣ በዚህ ማጠይቅ ላይ መሳተፍ ይፈልጋሉ። ይህ 30 ደቂቃ ሊወስድ ይችላል። የ ምትሰጠኝ መረጃዎች ሁሉ ሚስጥራዊ ሆነ ው ይቆያሉ እና ስምሽን መጥቀስ አያስፈልግህም።

ይህ ሁሉ መሉ በመሉ በፈቃደኝነ ት ላይ የ ተመሳረተ ነ ውእና እርስዎ ከመሳተፍ የ መቃወም መበት አለዎት. ተሳትፎ ወይም አለመሳተፍ እና ለ ጥያቄዎች መልስ አለመሰጠት በህይወትዎ ላይ ምንም ተጽእኖ አይኖረወም. ተጨማሪ ጥያቄዎች ካሉዎት ወይም የ ዚህን ጥናት ወጠት ማወቅ ከፈለጉ፣ እባክዎን ዋና መርማሪውን ለማ ጋገ ር ነ ፃ ነ ት ይሰማዎ። ከማከተለውአድራሻ ጋር.

ቤዛይት ተረፈ ሞባይል ስልክ፡ +251 912482785

II. የ ፍቃድ ቅፅ

ሁሉንም ሂደቶች እና የጥናቱን አላማ አንብቤያለሁ እናም የዚህ ጥናት ዓላማ ፣ ጥቅም እና ጉዳቱ በሚጃ የተደገፈ የቤት ወስጥ ምግብ አለመሞላት እና በተሚጡየህፃን ጠፍ ላይ ከሚደርሱ አሉታዊ ወጤቶች የሚያካትት የተጻፈወን ተረድቻለሁ። በኮልፌ ኬራንዮ ክፍለ ከተማሜኤከላት።

ጥናቱ ምንም አይነት ስጋት እንደሚይፈጥር እና ምንም አይነት ቅንብር እንደሚይሰጠኝም ተረድቻለሁ። ለማንኛወም ጥያቄ ምላሽ ለማስጠት አለመቾትን ከሞላሁ፣ ይህን ለሚድረግ በፈለግኩ ጊዜ ልተወው እንደምሞላ ተነ ግሮኛል።

የተሰጠወን ሚጃ ተረድቻለሁ እና ተሳትፎው ሞሉ በሞሉ በፈቃደኝነ ት ላይ የተማሰረተ ነው፡ ለጥያቄዎቹ የእኔ መልስ ለማንም እንደሚይሰጥ እና ስሜን እጽፉለሁ ብዬ እንደሜልጠበቅ ተነ ግሮኛል. አሁን በጥናቱ በፈቃደኝነ ት ለመሳተፍ ፈቃዴን እየ ሰጠሁ ነ ው።

ለመቀጠል ፍቃድህን ማግኘት እችላለሁ?

1. አዎ

2. አይ፣ ቆምብለህ ምላሽ ሰጪወን አማስግን።

በሚጃ የተደገፈ ፈቃድ ማሰጠቱን የ ሚያረጋግጥ የ ምሥክሮች ፊርማ።

ምስክር፡ ፊርማ_____

ቀን _____ ሚጃ ሰብሳቢ፡ -

ስም_____ ፊርማ_____ ቀን _____

ወጤት፡

1. ማስይቁ ተጠናቀቀ _____

2. ማስይቁ በከፊል ተጠናቀቀ _____

3. ተሳታፊ _____ አልተቀበለም.

4. ሌሎች (እባክዎ ይግለጹ) _____

በተቆጣጣሪ የ ተረጋገጠ፡ -

ስም_____

የ ተቆጣጣሪ ፊርማ_____

ቀን _____

ክፍል I. የ ዲሞግራፊ ባህሪያት

1. የ እናቶች ዕድሜ_____

2. የ ሴቶቹ የ ጋብቻ ሁኔ ታ

I. ያላገ ባች

II. ያገ ባ

III. ባል የ ሞተባት

IV. የ ተፋታ

3. የ ሴቶቹ ሥራ

I. የ ቤት እመቤት

II. የ መንግስት ሰራተኛ

III. የ ግል ሰራተኛ

IV. ነ ጋዴ

V. ዕለታዊ የ ጉልበት ሥራ

VI. ሌላ , ይግለጹ

4. የ ሴቶች የ ትምህርት ደረጃ

I. ምንምመደበኛ ትምህርት የ ለም

II. የ መጀመሪያ ደረጃ

III. ሁለተኛ ደረጃ

IV. ኮላጅ እና ከዚያ በላይ

6. የ ጥናቱ ተሳታፊዎች መሞሪያ

I. ከተማ

II. ገጠር

7. ወርሃዊ ገቢ በብር_____

ክፍል II. የ ስነ ተዋልዶ ባህሪያት

8. የ ቅድመወሊድ እንክብካቤ ክትትል አድርገ ዋል

I. አዎ

II. አይ

9. በህይወተዎ ወስጥ የ እርግዝናዎች ብዛ ት_____

10. የ አወላለደዎ ዘደ

በምጥ

II. በመሳሪያዊ

III. ሰርጀሪ

11. የ ሚጨረሻ እርግዝናዎ በስንት ሳምንተዎ ተወለደ_____

ክፍል III. የ ቤት ወስጥ የ ምግብ ዋስትና እጦት ተደራሽነ ት ደረጃ (HFIAS) ላይ ያሉ እቃዎች

12. ስለ ምግብ ሚጨ ቅ

I. አዎ

II. አይ

13. ተመራጭምግቦችን መመ ብ አለመቻል

I. አዎ

II. አይ

14. ወሱን ዓይነ ት ምግቦችን ይመ ቡ ነ በር

I. አዎ

II. አይ

15. ለመመገብ የሚይፈልጉትን ምግብ ይመገቡ ንብር

I. አዎ

II. አይ

16. ትንሽ ምግብ ይበሉ ነብር

I. አዎ

II. አይ

17. በቀን ወስጥ ጥቂት ምግቦችን ይመገቡ ነበር

I. አዎ

II. አይ

18. በቤተሰብ ወስጥ ምንምዓይነት ምግብ አይበላምነበር

I. አዎ

II. አይ

19. በምሽት በረሃብ ተኝተዉ ነበር

I. አዎ

II. አይ

20. ምንምሳይበሉ ሙሉ ቀንና ሌሊት ይሂዱ ነበር

I. አዎ

II. አይ

ክፍል IV. የ ልደት ወጩ

21. አዲስ የ ተወለደ የ ወሊድ ወጩ

I. በ ህይወት ያ ለ

II. የ ሞ ተ

22. አዲስ የ ተወለደ የ አ ፕጋር ወጩ በ አ ንድ እና በ አ ምስ ት ደቂቃ በ ቅደም ተ ከ ተ ል _____ እና _____

23. አዲስ የ ተወለደውክብደት በ ግራም_____

24. አዲስ የ ተወለደውየ እርግዝና ጊዜ በ ሳ ምን ት_____