



**SAINT PAUL'S HOSPITAL MILLENNIUM MEDICAL
COLLEGE (SPHMMC)**

**ANEMIA AND ASSOCIATED FACTORS AMONG PREGNANT
WOMEN ATTENDING ANTENATAL CARE CLINIC IN
PUBLIC HEALTH FACILITIES OF AKAKI KALITY SUB CITY,
ADDIS ABABA, ETHIOPIA, 2017**

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**A RESEARCH THESIS TO BE SUBMITTED TO SAINT PAUL'S
HOSPITAL MILLENNIUM MEDICAL COLLEGE DEPARTMENT OF
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REQUIREMENT OF THE DEGREE OF MASTER OF PUBLIC HEALTH
IN FIELD EPIDEMIOLOGY**

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APPROVAL SHEET

LETTER FOR DECLARATION (body of work with thesis)

I, the under signed, declared that this is my bona fide original work, has never been presented in this or any other University, and that all the resources and materials used for the body of work with thesis, have been fully acknowledged.

Student Name: Mitiku Seid Hussen

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Date: 21/02/2018

Place: Addis Ababa

Date of submission: 21/02/2018

This body of work with thesis has been submitted for examination with our approval as **Candidate's advisors.**

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**DEPARTMENT OF PUBLIC HEALTH GRADUATE STUDIES FINAL BODY OF
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As members of the Board of Examiners of the final body of work with thesis open defense, we certify that we have read and evaluated the body of work with thesis prepared by Mitiku Seid under the thesis entitled “Anemia and associated factors among pregnant women attending ante natal clinics of public health facilities in Akaki Kality sub city, Addis Ababa, Ethiopia, 2017” and recommencement for the *degree of Master of Public Health in Field Epidemiology*.

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Final approval and acceptance of the body work with thesis is contingent upon the submission of the final both hard and soft copies of the body of work with thesis to the department of public health.

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ABBREVIATION AND ACCRONYMS

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
CON.	Concentration
LAB.	Laboratory
EDHS	Ethiopian Demographic Health Survey
EDTA	Ethylene Diamine Tetra Acetic Acid
EPI-info	Epidemiological Information
HIV	Human Immunodeficiency Virus
HB	Haemoglobin
HCT	Haematocrit
ID	Iron Deficiency
MRN	Medical Record Number
PI	Principal Investigator
SGA	Small for Gestational Age
SPHMMC	Saint Paul's Hospital Millennium Medical College
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

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ABSTRACT

Background: Anaemia is expressed by low levels of hemoglobin in the blood and iron is a key component of hemoglobin. It affects 30% of the population. But during pregnancy it is major public health problem particularly in developing countries. Anemia is one of the major and continues causes of mortality and morbidity during pregnancy therefore study and follow up should be continues. In the area prevalence of anaemia may be high due to the geographical, socio-economic and parasitic infections. Therefore the aim of the study is to assess the status of anemia and associated factors of pregnant women attending antenatal care clinic.

Methods: Facility based cross sectional study was undertaken in Akaki Kality Sub City from November 01-30/2017. Sample size was determined to be 401 and selected randomly and collected through trained health professionals. The Data was entered in to Epi Info and exported to SPSS version 21 and analyzed. Descriptive statistics were done. To see associated factors of variables logistic regression was fitted by using odds ratio at P value 0.05, confidence interval 95%. Finally, results were presented using tables, graphs and texts.

Results: Prevalence of anemia was 13.4% with respondent rate of 91%. Majority of the participants (65.3%) have mild anemia (10-10.9gm/dl). Mean and standard deviation age of participants was 26.79 and 5.047 respectively. Bleeding due to accident (OR=4.2, 95%, CI=1.511-11.633) is seems to be major contributor of anemia but knowledge (OR=0.36, 95%, CI=0.168-0.780) has protective effect, but socio demographic, maternal characteristics and feeding habit have no association with anemia.

Conclusion: mild type of anemia was major problem and bleeding due to accident and knowledge were statistically associated with anemia.

Recommendation: awareness creation about anemia, identify causes of bleeding and further study are recommended.

Key words: Hemoglobin, Pregnancy in Akaki Kality, Ethiopia 2017

1. INTRODUCTION

1.1. Background

Anaemia is expressed by low levels of hemoglobin in the blood and iron is a key component of hemoglobin, and iron deficiency takes half of all anaemia globally(1). During pregnancy, increase plasma volume will increase in red cell volume result in hemo-dilution and decrease HB concentration and in normal pregnancy without iron supplementation HB concentration decreases from an average of 12.5–13.0 g/dL to an average of 11.0–11.5 g/dL(2). Hemoglobin concentration used in the present study has been recommended as an indicator for iron deficiency anaemia by the World Health Organization(3).

Anaemia during pregnancy and at delivery defined by hemoglobin (HB) concentration lower than 11 g/dl is an important public health problem in low-income and middle income countries(4). Iron is an essential micronutrient which is important to not only in carrying oxygen but also to the catalytic activity of a variety of enzymes in the fetus, to the synthesis of hemoglobin and in brain development(5). Knowledge of the relative importance of the different etiological factors are the basis for intervention strategies to control anaemia(6).

Maternal deaths are the second biggest report of women of reproductive age and every year, approximately 287000 women die due to complications in pregnancy and childbirth(7). By the end of 2015, roughly 303000 women died 99% of them are in low-income countries implies that about 830 women deaths around the world every day and two third of maternal deaths were in Africa(8).Iron deficiency (ID) is common in pregnant women particularly in developing countries(9). Anemia is affecting 1.3 to 2.2 billion persons out of these iron deficiency contributes for half of the burden of anemia globally from these 50% are women of reproductive age group that contributes more than 115 000 maternal and 591 000 prenatal deaths per year(10).

Around 50% of pregnant women worldwide are anemic with at least half of this burden due to ID(6).Anaemia has been claimed to be the most common nutritional disorder in pregnancy across the world and its prevalence is estimated to be 41.8% (more common in Africa 57.1%)(11). Nutritional awareness and practice of woman during pregnancy will determine their nutritional status significantly affects the outcome of pregnancy(12). Anemia in pregnancy is one of the most common

and widespread public health problems affecting 24.8% of the population in the world today with highest proportions of individuals affected in Africa and in Southeast Asia(13).

About 90% of maternal anemia may be attributable to inadequate consumption of dietary iron in addition to these, increased blood loss due to hookworm or schistosomiasis, bleeding hemorrhoids, vitamin deficiencies, HIV add to prevalence of anemia in pregnant women. Further more in developing countries there are various causes that contribute to decreased adherence to iron supplementation(14). For instance in Sub-Saharan Africa the causes of anaemia during pregnancy are multi-factorial including an iron and foliate deficient diet and infections such as malaria, hookworms, and increasingly human immunodeficiency virus thus most of these conditions can be prevented by creating awareness and providing affordable interventions(6).

During pregnancy estimated that in sub-Saharan Africa 23 million women are exposed to malaria infection annually and approximately 400 000 pregnant women develop moderate or severe anaemia each year, poor socio-economic and educational statuses are the principal reasons for high prevalence of anaemia in pregnancy in developing countries but anaemia is an indicator of nutritional deficiencies that significantly contribute to birth defects, preterm labour and low birth weight, hence it causes global public health problem(15).

1.2. Statement of the Problem

There is a strong association between severe anaemia and maternal mortality but the risk of maternal mortality in pregnant women with moderate anaemia was open to doubt(11). So it should be a continuous activity to measure and follow its magnitude and outcomes.

Negative impact and poor compliance of pregnant women is due to their inadequate knowledge and negative attitudes could have a profound influence on their hemoglobin levels(16). In Ethiopia about one-fourth of women age 15-49 (23 percent) are anemic (17% mildly, 5 percent moderately and less than 1 percent is severely anemic) and prevalence of anaemia varies according to living area, age, sex and altitude that were 59% in Somali and 16 percent in Amhara and Addis Ababa Regions(1).

Anaemia prevalence among women age 15-49 in Addis Ababa is 16 percent (mild=12.7, moderate=3.2 and severe 0.1) and(1). But associated factors of anemia during pregnancy are not justified therefore it is important to assess these factors in addition to these there are a lot of factors

(geographical, socio-economic and parasitic infections (according to the sub city data malaria cases are reported)) that differentiate Akaki Kality sub city from other parts of the city that may make prevalence of anaemia different from Addis Ababa.

1.3. Significance of the Study

It helps for the sub city to enumerate the degree of anemia among the pregnant women, helps for pregnant mothers, health professionals and decision makers to know factors responsible for predisposing to anaemia. It helps health professionals to have information about associated factors of anemia. It helps decision makers to give attention, to plan and minimize the problem. It helps researchers to do further investigations based on this finding.

2. LITERATURE REVIEW

2.1. Prevalence of Anaemia among Pregnant Women

Cross sectional study done in Marie Stopes Clinic in Dhaka, Bangladesh showed that 37 % were anaemic (mild 26 % and moderate 11 %)(17). The same research conducted in Urmia University of Medical Sciences, Urmia, Iran showed that hemoglobin levels in non anemic group drop in the second trimester. Pregnant women with hemoglobin less than 10 g/dl, considered as anemic while pregnant women with higher hemoglobin level (>10 g/dl) considered as normal. Prevalence of anaemia was 20.2 %. Out of them, 16.2 % had moderate anaemia (HB=6.5-8 g/dl) and 83.8% had mild anaemia (HB=8.1-10 g/dl). Severe anaemia did not detect in pregnant women(18).

A research conducted in African continent Kinshasa, DR Congo described that hemoglobin blood concentration < 10 g/dL was diagnosed in study participants and out of them 53.4 % of the study participants were below the explained blood haemoglobin level(19).

Cross sectional study done in Bisidimo hospital eastern Hararghe Zone resulted that the overall prevalence of anaemia was 27.9%. The mean HB value was 11.4 ± 2.3 g/dl. Of the anemic pregnant women, 55%, 32.5% and 12.5% had mild, moderate and severe anaemia, respectively(6). Similar study done in Wolayta Sodo indicated that the mean HB concentration was 11.55 ± 2.97 g/dl with a range of 5.4 to 18.7g/dl. Its prevalence was 39.94%. Among them 30.34% had mild anaemia, 60% had moderate anaemia, and 9.66% had severe anaemia (20).

There was a study done in Selam health center, Addis Ababa which indicated that the mean HB was 12g/dl with lowest and highest values 7.8 and 13.8g/dl respectively. The overall prevalence of anaemia among the pregnant women was 16.3% out of these 48% moderate and 52% mild case and there was no severe anaemia cases(14).

2.2. Socio demography and with anemia

The study done in Bangladesh showed that maternal anaemia was significantly associated with age, educational status living area, and income with low income group comprised a higher portion of anaemia with the use of antenatal care services(17). A study conducted in Wolayta resulted that accordingly; age 15-24, family size >5 and having low income were identified as independent predictors of anaemia among pregnant women(20) Additional Study done in Selam health center showed that age group (years) 18-24 were at significantly increased risk of being anemic(14).

2.3. Anaemia and associated factors

Cross sectional study done in America showed that cigarette smoking 22.7% of pregnant women aged 18 to 25 and 11.8% of pregnant women aged 26 to 44 continue to smoke throughout pregnancy and about 7% of Maryland women continue to smoke during pregnancy(21). Study done in Lancashire/England indicated that despite the known risks of smoking and tobacco use 19% women were smoking at the time of delivery in Lancashire (2012/13), significantly higher than the rate for England. There is also evidence to show that 63% of pregnant women drink at some point during their pregnancy, with 17% reporting binge-drinking behaviors. There is a strong social gradient, with older mothers and those of a higher socioeconomic group having a greater tendency to drink during pregnancy, particularly wine, whilst drinking beer is associated with smoking and a lower educational attainment of the mother(22).

A research conducted in India indicated that overall 52.5% of the participants had good knowledge regarding anemia, Iron rich food and iron supplementation but when specifically questioned only 39.87% were aware of and understood the term anemia(16). Another descriptive research conducted in Yenepoya Medical College Hospital, Deralakatte and Mangalore in India states that 54% antenatal mothers had satisfactory knowledge, 38% had poor knowledge, and 8% had good knowledge regarding anemia during pregnancy(23). Another study in India, 81.96% of participants were aware that consumption of diet poor in iron to be the reason behind anemia but knowledge about iron rich foods was lacking among participants 79.74% said that green leafy vegetables are a good source of iron but only 25.9% considered meat as a good source of iron(15).

Descriptive study done in Brosankro community in Ghana showed that 100% of participants were aware and define anaemia based on their understanding, 97% of study participants have knowledge causes of anaemia in pregnancy but 14% of women claim no knowledge of any effects or consequences associated with anaemia in pregnancy and 18% of participants were aware of food sources that can fight against anaemia(24). But a research conducted in Debre Birhan, Ethiopia showed that there was no an association between Knowledge of pregnant women and anaemia that means knowledge has no impact on anemia during pregnancy(25).

In India, cross sectional study was done and because of chronic blood loss due to infection such as malaria and hookworm infestations additionally cardiac failure and urinary tract infection increases

the prevalence of anaemia(26). The study conducted in DR Congo indicated that anaemia was found significantly linked to malaria , urinary infection, diabetes in family, obesity, previous cesarean section and previous pre-eclampsia(19). Another study conducted in Wolayta resulted that current clinical illness and history of excess menstrual bleeding were identified as independent predictors of anaemia among pregnant women(20). Study done in Selam health center showed that intestinal parasitic infection-positive participants were linked to anaemia Similarly, HIV-sero-positive statistically significant predictor of anaemia and individuals who had less than 2 years inter pregnancy gap were also at significantly higher risk of having anaemia than those who had 2-3 years gaps(14).

The paper published in Indian women indicated that malnutrition rates were high but one-third of the mothers (31.1%) consumed an adequately diversified diet(27). Bad nutritional habits among Yemeni pregnant women explained by the national nutrition strategy for Yemen which included inadequate dietary intake quantitatively and qualitatively, less access of nutrition screening and counseling services, early and frequent pregnancies were practiced it also indicated that blood transfusion to Khat chewer pregnant women was higher than to non-Khat chewer pregnant women (33.2% vs. 19.6%) and lower mean hemoglobin concentration Khat chewer pregnant women when compared to non-Khat chewer pregnant women(28).

Bangladesh study showed that 37 % of the pregnant women had anaemia in third trimester compared to second trimester which was 32%(17). But when we see the study done in Indian women almost one-fifth of the mothers were moderately or severely anaemic, 31% were underweight while 22% were either overweight or obese. One-fourth reported of taking iron and folic acid supplementation for at least 90 days during their last pregnancy, though almost two-thirds (65%) reported taking an iron and folic acid supplement at some point during their pregnancy but 31% of the births were preceded by an interval of more than 3 years and 1% of the pregnancies were multiple births(27).

Gulu and Hoima Regional Hospitals in Uganda study showed that anaemia prevalence was highest (24.3 %) during the third trimester as compared to the first trimester (14.6 %) and second trimester (20.7 %) with large majority of the study participants were below the age of 25 years (29). A study conducted in Wolayta resulted that being in third trimesters, and low body mass index were identified as independent predictors of anaemia among pregnant women(20). Study done in Selam

health center indicated that individuals who had less than 2 years inter pregnancy gap were also at significantly higher risk of having anaemia than those who had 2-3 years gaps(14).

Conceptual Frame Work of Study Variables

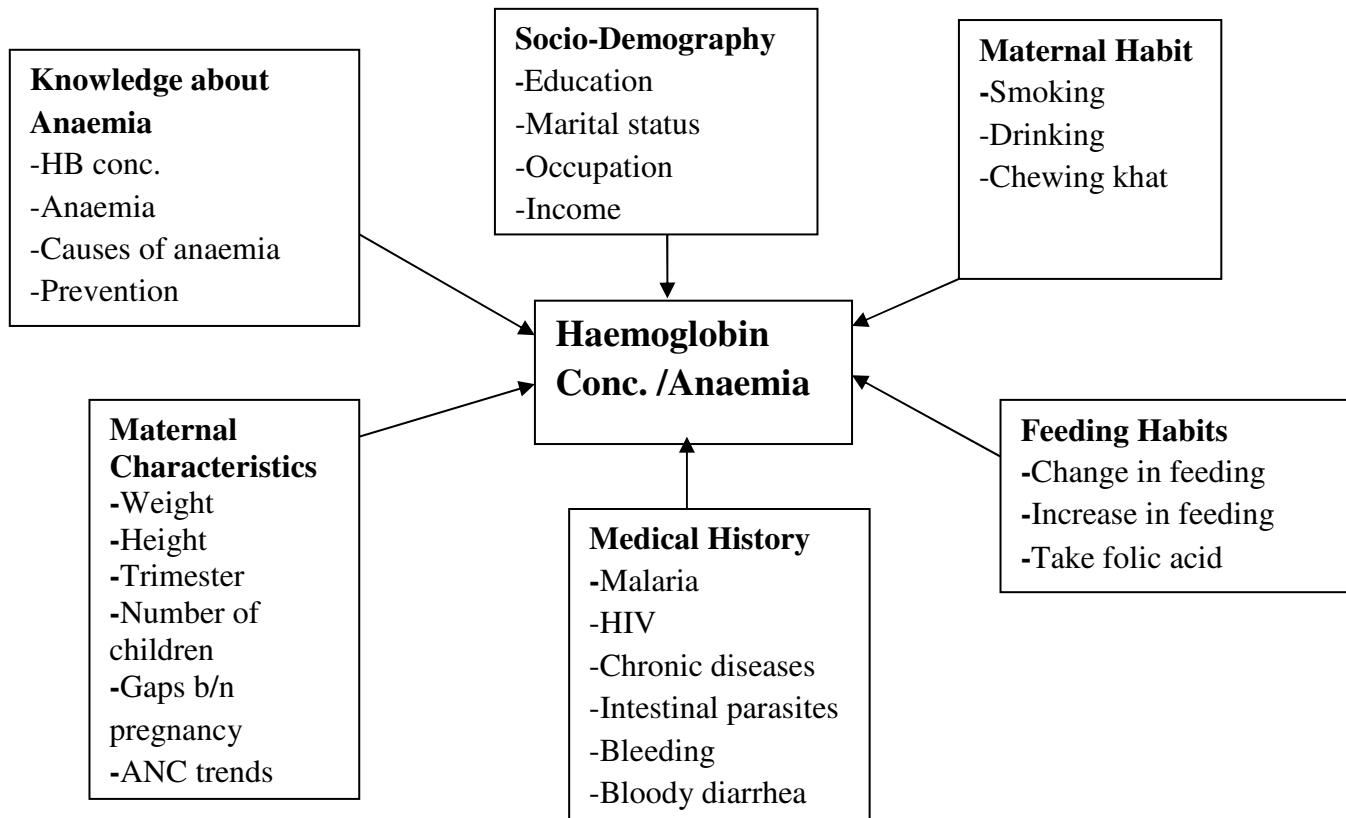


Figure 1: Conceptual Framework of Study Variables Based on Literature review in 2017

3. OBJECTIVES

3.1. General Objectives

- To assess the status of anemia and its associated factors among pregnant women attending ANC clinics in Akaki Kality, Addis Ababa, Ethiopia, 2017.

3.2. Specific Objectives

- To assess the prevalence of anemia among pregnant women attending ANC at health facility.
- To identify factors associated with anemia among pregnant women attending ANC at health facility.

4. METHODS

4.1. Study Area

Akaki Kality is one of the ten sub cities and located in the southern parts of Addis Ababa 20 KMs far from the city's center (Menelik Square). It is industrial zone of the city as well as the country and most of the woredas are found at the out skirts of the city in addition to this factory workers and civil servants constitute the majority population segment and the majority of the factory workers and some inhabitants earn below US\$ 1 a day(30). Akaki –Kality has many features and its climate is hotter than other sub cities and its altitude is slightly lower and it is expected that some malaria cases are reported because it is in the border of Oromia region where malaria cases are reported.

According to Wikipedia it is located in Ethiopia Coordinates: 8°53'40.92"N 38°46'23.52"E with a total area of 118.08 km²(31). Its population is estimated to be 227,182 with 116,747 female, 110,435 male, expected women in reproductive age group 40, 441 and expected pregnant women is 2720(32). It has two hospitals (one governmental) seven health centers and fifty eight private clinics, twenty six organizational clinics three nongovernmental facilities. There was no specialty clinic assigned to do maternal and child health care from private and organizational clinics and according to the sub city data ANC access and utilization is 100%.

4.2. Study Period

Data collection (study period) was from November 01- 30/2017.

4.3. Study Design

Facility based cross-sectional study design was applied

4.4. Source population

All pregnant women who utilize ANC service in governmental health facilities and live in the Sub City.

4.5. Study population

Pregnant women coming to selected health facilities and selected as a sample to participate in the study.

4.6. Inclusion Criteria

Pregnant women coming to health facility to get ANC service

4.7. Exclusion Criteria

Pregnant women unable to communicate during ANC service, who were in special dietary treatment, blood transfusion and were not living in Addis Ababa for the last six months.

4.8. Sample Size Determination

Single population proportion formula was used considering prevalence of anemia(16.3%) and association of HIV sero prevalence among pregnant women and anaemia done in Selam health center Addis Ababa (p) =38.7%(14).Confidence interval (CI)95% and 5% marginal error. Finally the sample size was determined by adding 10% for the non-response rate.

$$d = Z_{\alpha/2} \frac{pq}{n} \quad d^2 = [Z_{\alpha/2}]^2 \cdot \frac{pq}{n}$$

$$d^2 = [Z_{\alpha/2}]^2 \cdot \frac{pq}{n} = n = \frac{\left(\frac{Z_{\alpha}}{2}\right)^2 \cdot pq}{d^2}$$

Where d= marginal error

P= prevalence of previous study

q=1-p

$Z_{\alpha/2}$ = confidence interval

$$n = \frac{\left[\frac{Z_{\alpha}}{2}\right]^2 \cdot p[1 - p]}{d^2}$$

$$n1 = \frac{(1.96)^2 \cdot 0.163(1 - 0.163)}{0.05^2}$$

$$\frac{3.84 * 0.163(0.837)}{0.0025} = \frac{3.84 * 0.136}{0.0025} = \frac{0.524}{0.0025} = 210$$

$$n2 = \frac{(1.96)^2 \cdot 0.387(1 - 0.387)}{0.05^2}$$

$$\frac{3.84 * .0.387(0.613)}{0.0025} = \frac{3.84 * 0.237}{0.0025} =$$

$$\frac{0.52389504}{0.0025} = 0.910967$$

$$(364.386 + 10 \% [36.4386] = 400.825 = 401)=401$$

4.9. Sampling Technique

All governmental health facilities were involved therefore pregnant women who were coming to health facility were taken randomly. The final calculated sample size was divided proportionally based on their service delivery in the last three months report to eight governmental health facilities then from each facility the data was collected by using health professionals who were working in the health facilities after they are trained.

Calculation for sample size determination of participants from each health centers based on the previous three months client flow from registration book (source Akaki Kaliti sub city health office and Tirunesh Beijing hospital).

Table 1: Number of samples allocated for each health facilities based on their service delivery of Akaki Kaliti sub city 2017

Number of participants	Average sample size of each health facility X total sample size
	Total average population of all health facilities

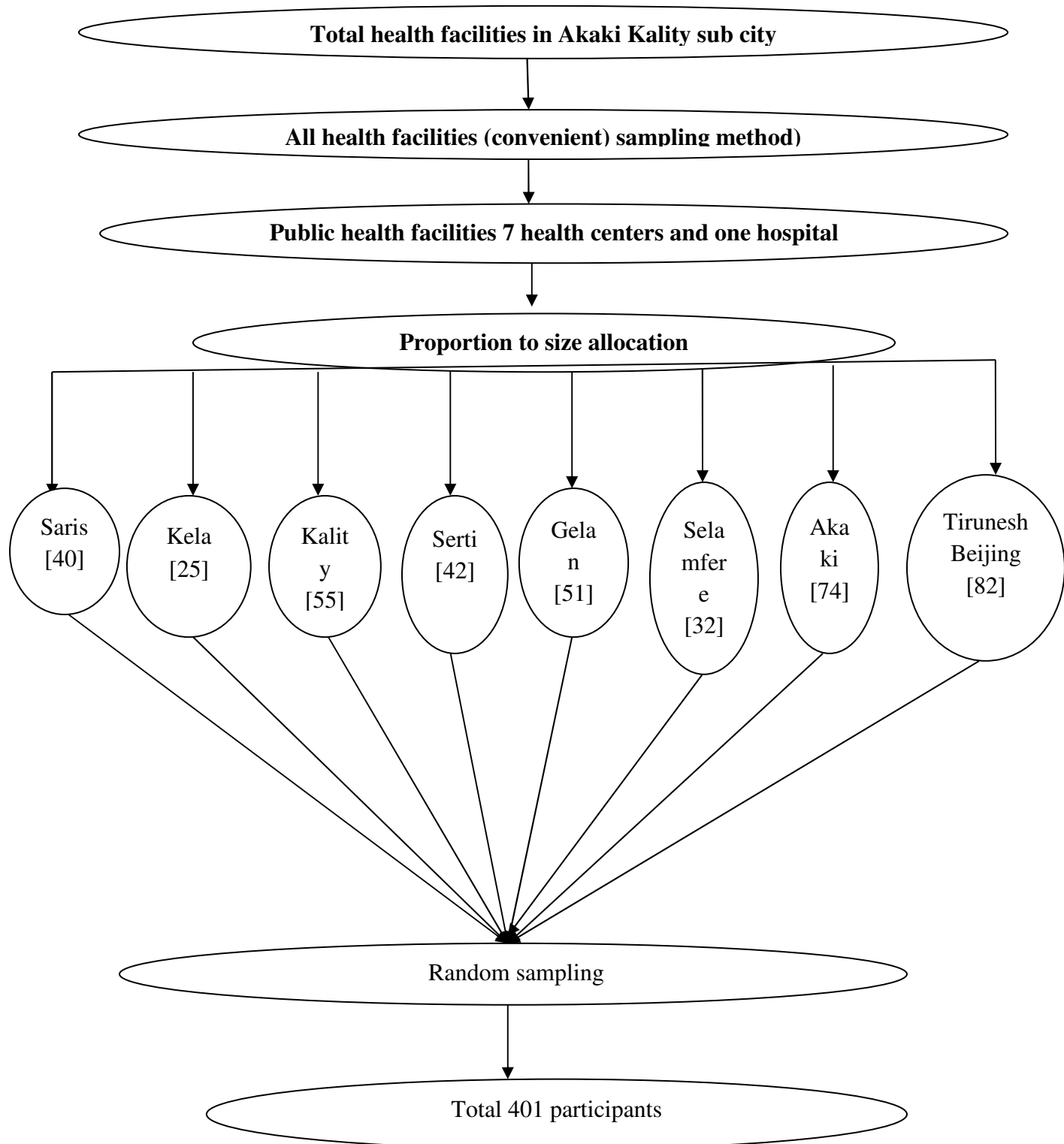


Figure 2:- Schematic presentation of sampling procedure

4.10. Dependent Variables

- Anemia

4.11. Independent Variables

- Socio demography (Age, Educational Status, Personal Income, Occupation, Number of Family)
- Maternal health history (Malaria, Bloody diarrhea, Chronic kidney disease, Intestinal worms, HIV, Bleeding due to accident and others)
- Maternal behaviors (smoking, alcohol consumption and chewing khat)
- Maternal characteristics (trimester, Weight, Height, use of folic acid, ANC Follow up, number of pregnancies and gaps between consecutive births)
- Maternal feeding habits (change feeding habit, type of food and increase amount of food)
- Maternal knowledge status.

4.12. Operational Definition

Anaemia: is classified as pregnant women with haemoglobin levels below 11.0 g/dl were defined as anaemic. Women with <7.0 g/dl of haemoglobin have severe anaemia, women with 7.0-9.9 g/dl have moderate anaemia, and pregnant women with 10.0-10.9 g/dl have mild anaemia(1).

Knowledge of pregnant Women: A pregnant woman was classifies as knowledgeable if her knowledge score was 7 and above out of 11 and not knowledgeable if her score was <7 out of 11(12). The knowledge components were knowledge of the pregnant women know her HB concentration, know about Anaemia, its causes, prevention, whether it is curable or not, information and its consequence during pregnancy.

Feeding habit during pregnancy: pregnant women feeding habit is well if she uses foods, which are rich in iron, include dried beans, green leafy vegetables, whole grain enriched bread and cereal, dried fruits, meat and eggs(33). These are eating variety of food, increasing amount to eat during pregnancy, iron supplement duration and food source of iron, need for supplements in addition to regular foods.

A woman was considered as having appropriate pregnancy specific nutrition practice if she is practicing at least 7 of the following 11 practices listed below:(12).

1. Add at least one additional meal from non pregnant state

2. Eating 2 to 3 servings of meat, fish, nuts or legumes (proteins)
3. Eating 2 to 3 servings of dairy (milk, eggs, yogurt, cheese)(egg and milk products)
4. Eating 2 servings of green vegetables; 1 serving of green vegetable
5. Eating 3 servings of fruit
6. Eating 3 servings of whole grain breads, cereals, or other high-complex carbohydrates (carbohydrates)
7. Taking folic acid for the last seven days
8. Decreased coffee/tea intake during current pregnancy
9. Not avoiding any food type during pregnancy
10. Not taking alcohol
11. Increase amount of food to eat during pregnancy

Medical history of pregnant Women: A pregnant women who was previously ill with different type of disease like Malaria, Bloody diarrhea, Chronic kidney disease, Intestinal worms, HIV, Bleeding due to accident and other type of disease is considered as with history of disease. Bleeding due to accident consists of bleeding due to injury, car accident, due to unknown diseases and previous history of abortion.

Smoking cigarette: If there is practice of pregnant woman smoking cigarette during pregnancy.

Alcohol Consumption: If woman had drunk alcohol in the previous 12 months during pregnancy she was categorized as an alcohol consumer. There are differing levels of drinking and people can be categorized into abstainers, lower risk (sensible), increasing risk (hazardous) and higher risk (harmful) drinkers(22).

Khat chewing: pregnant woman who has a habit of chewing khat is said to be khat chewer by asking the respondents about the number of days they chewed khat within a month(33).

4.13. Data Collection Procedure

Data was collected by trained health professionals who are working in the health facilities. Collectors were using semi structured questionnaire to obtain data on socio-demography, medical history, ANC follow up history of the women from the pregnant mothers and some variables were taken from the registration book (hemoglobin level, weight and height). The collected data was cleaned manually and checked its completeness.

4.14. Data collection instruments

Anemia was evaluated by semi structured questionnaire and questionnaire was developed by the investigator adopting questions from past similar studies instruments and knowledge of pregnant women(12,21). The questionnaire has six sections. The first section focused on socio-demographic characteristics such as age, marital status, occupation, level of education, family size, and social as well as obstetrics history. The second section has medical history of pregnant women, the third included maternal behavior, the fourth section was maternal characteristics, the fifth part feeding habit and the last part was personal knowledge of pregnant women. It is prepared in to two languages (in Amharic and English language)

4.15. Data Quality Assurance

To assure the quality of the data the questionnaire was first tested by 5% pregnant women outside the selected health facility to avoid unnecessary information and to improve the contents of the questionnaire. Health professionals were trained to administer the questionnaire. Data accuracy was assured by on-site cross-checks by the supervisor.

4.16. Data Analysis

The collected data was entered in to EPI-info version7 then filtered, cleaned and exported to SPSS version 21 software for analysis. Descriptive statistics were expressed in number and percentage. Logistic regression models were fitted to test the association between dependent and independent variables. P value less than 0.05and 95%confidence interval was considered as statistically significant. Results were presented in text,grapgs and tables.

4.17. Ethical consideration

Ethical clearance was obtained from SPHMMC department of Public health and Addis Ababa Health Bureau. After a written letter is obtained from Addis Ababa health bureau to Akaki Kaliti sub city and Tirunesh Beijing hospital, the sub city health department was writing support letter to study health centers. Finally consent was obtained from study participants. Personal identifiers were not written anywhere in the questionnaire and kept strictly by using codes whatever information they provide were never disclosed to the third party except for the purpose of the study.

4.18. Dissemination of Results

The findings of the study will be interpreted and shared to SPHMMC, Addis Ababa Health Bureau and other stakeholders.

5. RESULT

5.1. Socio-Demographic Characteristics

The study sample consisted of 365 antenatal mothers with response rate of 91%. Mean and standard deviation age of participants was 26.79 and 5.047 respectively. About 215(59%) of antenatal mothers belonged to the age group of 25-35 years, and majority 256(70.1%) of antenatal mothers belonged to in the third trimester of pregnancy and 11(3%) of them were at their first trimester. Majority 116(31.8%) of antenatal mothers had high school education but 154(45.3%) of their husbands education was diploma and above. Larger numbers of the antenatal mothers 154(42.2%) were housewives but most of their husbands' jobs 244(71.8%) were in private sector. Most of the participants nearly three fourth 264(72.3%) of the respondents had monthly income of greater than 2575 Ethiopian Birr but few number of them 08 (2.2%) had monthly income of less than 1000 birr. Concerning marital status 340(93.2%) of pregnant women were married as shown below in [table2](#).

Table 2: Socio-Demographic Characteristics of Antenatal Mothers in the sub City Ethiopia 2017

VARIABLES	FREQUENCY	PERCENTAGE
Age		
15-24	129	35.3
25-35	215	58.9
36-49	21	5.8
Marital Status		
Married	340	93.2
Single	25	6.8
Occupation		
Housewife	154	42.2
Private	121	33.2
Governmental	79	21.6
Student	11	3.0
Husbands occupation		
Private	244	71.8
Governmental	96	28.2
Educational status		
Unable to read and write	35	9.6

VARIABLES	FREQUENCY	PERCENTAGE
Elementary	100	27.4
High school	116	31.8
Diploma and above	114	31.2
Husbands Educational status		
Unable to read and write	20	5.8
Elementary	59	17.4
High school	107	31.5
Diploma and above	154	45.3
Income		
<1000	8	2.2
1000-2575	93	25.5
>2575	264	72.3
Trimester		
First	11	3.0
Second	98	26.9
Third	256	70.1

5.2. Anemia and Related Variables

Based on the classification of anemia 32(34.7%) of pregnant women were classified as moderately anemic (Hb level 10-10.9g/dl) and 17(65.3%) of them were mild cases (Hb level 7-9.9g/dl) as shown in figure 3 but there were none being severe. The mean hemoglobin concentration of the antenatal mothers was 12.73 g/dl with standard deviation of 1.39. The lowest and highest values of the hemoglobin level were 8.00 and 17.3g/dl respectively.

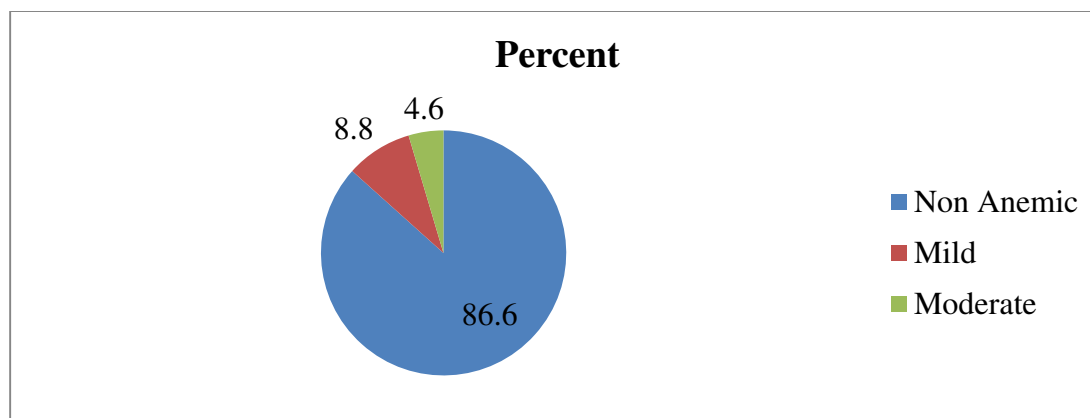


Figure 3: Percentage of Anemia among pregnant women based on their hemoglobin concentration in Akaki Kaliti sub city 2017

5.2.1. Anemia and Socio-demographic Characteristics of Respondents

When we see age category from all anemic pregnant women 26(53.1%) of them were in (25-35) age group. Based on their educational status 17(34.7%) of pregnant women who were educated up to high school level were anemic as illustrated in [table 3](#).

Table 3: Anaemia and Demographic Characteristics Relationship of Pregnant Women in Akaki Kaliti Sub City Ethiopia in 2017

Variable		Anemic, no. (%)	Non- Anemic, no. (%)	Total, no. (%)	COR(CI)	P.value
Age						0.228
	15-24	22(44.9)	107(33.9)	129(35.3)	0.243(0.031-1.908)	0.179
	25-35	26(53.1)	189(59.8)	215(58.9)	0.363(0.047-2.823)	0.333
	36-49	1(2)	20(6.3)	21(5.8)	-	-
Marital Status	Married	22(7)	294(93)	316(86.6)	0.871(0.251-3.029)	0.828
	Single	3(6.1)	46(93.9)	49(13.4)	-	-
Educational Status						0.996
	Unable to read and write	3(6.1)	32(10.1)	35(9.6)	-	-
	Elementary	13(26.5)	87(27.5)	100(27.4)	0.546(0.168-2.347)	0.358
	High school	17(34.7)	99(31.3)	116(31.8)	0.545(0.150-1.984)	0.377
	Diploma and above	16(32.7)	98(31.1)	114(31.2)	0.619(0.142-2.094)	0.534
Occupation						0.159
	Governmental	10(12.7)	69(87.3)	79(21.6)	3.943(0.976-15.93)	0.054
	Private	13(10.7)	108(89.3)	121(33.2)	4.747(1.22-18.432)	0.024
	Housewife	22(14.3)	132(85.7)	154(42.2)	3.429(0.93-12.691)	0.065
	Student	4(36.4)	7(63.6)	11(3)	-	-
Husbands Occupation	Governmental	11(11.5)	85(88.5)	96(28.2)	0.484(0.375-1.592)	0.772
	Private	35(14.3)	209(85.7)	244(71.8)		

5.2.2. Anemia and other variables

Pregnant women who had bleeding due to accident were larger in number to expose to anaemia with 10(21.3%) and. Around 170 (46.6%) of the mothers conceded their first pregnancy. Concerning knowledge status of pregnant women 151 (41.4%) were knowledgeable about anemia during pregnancy. Considering feeding habit of antenatal mothers only 120(32.9%) of them had appropriate pregnancy specific nutrition practice and drinking alcohol was practiced by 100(27.3%) of pregnant women (Table4).

Table 4: Anaemia, Reproductive and Medical Characteristics of Pregnant Women in Akaki Kality Sub City Ethiopia 2017

Variable (Type of Diseases)		Anemic, no. (%)	Non-Anemic, no. (%)	Total, no. (%)	COR	P.value
Bleeding due to Accident	YES	10(21.3)	37(78.7)	47(12.9)	1.933(0.891-4.196)	0.095
	NO	39(12.3)	279(87.7)	318(87.1)	-	-
Trimester						0.220
	First	3(27.3)	8(72.7)	11(3.1)	-	-
	Second	16(16.3)	82(83.7)	98(26.8)	0.354(0.089-1.409)	0.140
	Third	30(11.7)	226(88.3)	256(70.1)	0.680(0.353-1.313)	0.251
Number of Pregnancies						0.037
	FIRST	31(18.2)	139(81.8)	170(46.6)	0.166(0.022-1.269)	0.084
	2-3	17(10.2)	150(89.8)	167(45.7)	0.327(0.042-2.559)	0.287
	>3	1(3.6)	27(96.4)	28(7.7)	-	-
Drink Alcohol	YES	18(18)	82(82)	100(27.3)	1.657(0.88-3.12)	0.118
	NO	31(11.7)	234(88.3)	265(72.7)	-	-
Over all feeding habit	YES	24(20)	96(80)	120(32.9)	-	-
	NO	25(10.2)	220(89.8)	245(67.1)	2.2(1.196-4.0460)	0.011
Knowledge	YES	29(19.2)	122(80.8)	151(41.4)	-	-

of pregnant women	NO	20(6.4)	194(93.6)	314(58.6)	2.3.6(1.249-4.256)	0.008
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5.3. Multivariable Analysis

Association between anemia among pregnant women and each independent variable were checked using binary logistic regression model and those variables that had significance association at P value< 0.2 have been selected and multivariable analysis was conducted to identify factors independently associated with anemia and factors with the P value< 0.05 was considered as statistically significant. Based on this bleeding due to accident during pregnancy and knowledge status of pregnant women have significant association with anemia as shown in [table 5](#).

Table 5: Association between Anemia and Other Variables of Pregnant Women in Akaki Kaliti Sub City Ethiopia 2017

Variables	Category	Anaemic (%)	Non Anaemic (%)	COR (C.I.)	P. Value	AOR (C.I.)	P. Value
Bleeding due to accident	Yes	10(21.3)	37(78.7)	1.9 (0.89 - 4.2)	0.10 *	4.2 (1.511 - 11.633)	0.006 **
	No	39(12.3)	279(87.7)	-	-	-	-
Feeding habit	Yes	24(20)	96(80)	2.2(1.196-4.046)	0.011 *	0.925(0.365-2.346)	0.870
	No	25(10.2)	220(89.8)	-	-	-	-
Number of pregnancy	FIRST	31(18.2)	139(81.8)	0.166(0.022-1.269)	0.036 *	0.196(0.25-1.547)	0.122
	2-3	17(10.2)	150(89.8)	0.327(0.042-2.559)	0.08 *	0.313(0.039-2.519)	0.275
	>3	1(3.6)	27(96.4)	-	-	-	-
Drink alcohol	Yes	18(18)	82(82)	1.657(0.880-3.120)	0.118 *	2.07(0.926-4.651)	0.076

	No	31(11.7)	234(88.3)	-	-	-	-
Knowledge	Yes	29(19.2)	122(80.8)	0.434(0.235-0.801)	0.008*	0.36(0.168-0.780)	0.010**
	No	20(6.4)	194(93.6)	-	-	-	-
Occupation	Governmental	10(12.7)	69(87.3)	3.943(0.976-15.93)	0.054*	4.2(0.871-20.39)	0.074
	Private	13(10.7)	108(89.3)	4.747(1.22-18.432)	0.024*	3.68(0.815-16.62)	0.90
	Housewife	22(14.3)	132(85.7)	3.429(0.93-12.691)	0.065*	3.73(0.853-16.3)	0.08
	Student	4(36.4)	7(63.6)	-	-	-	-
Hint:-*P value less than 0.2 statistically significant for COR ** P value less than 0.05 statistically significant for AOR							

6. DISCUSSION

The overall anemia prevalence among the study participants was 13.4 % (hemoglobin level less than 11g/dl). Compared to previous studies in various settings in Ethiopia this figure is not comparable. For instance, prevalence of anemia was reported 19.7% from Mekelle town, northern Ethiopia(10), 16.3% in Selam health center Gullele sub city, Addis Ababa(14), 21.3% in Tikur Anbessa Hospital(34) and 39.94% in Wolayta Sodo Otona Hospital southern part of Ethiopia(20), but higher than Debre Birhan health institutes which was 9.7% (25). On the other hand, Outside Ethiopia, for instance, the prevalence of anemia was much higher 38.7% in Mbulu district, Tanzania and(35), 37% among pregnant women in Marie Stopes Clinic in Dhaka, Bangladesh(17). This difference might be due to awareness of pregnant women to health care service and regular antenatal care including proper folic acid intake, improved feeding habit, presence of some diseases like malaria and different climatic and altitude change.

The result shows that anemia is not primary problem in the sub city as there were no severe cases and majority of cases were at mild level. This finding is comparable with the finding in Mekelle that anemia was a mild problem (severe anemia was 1.6%)(10), but better than the finding in Debre Birhan 3.6% (25), and Wolayta Sodo Town, Southern Ethiopia 3.89% of cases were severe anemia cases (20). However, the result is markedly different from the reports from southeast Ethiopia where the prevalence of severe anemia was 12.5%(6). This might be due to differences in socio-economic, feeding habit and level of health awareness differences (proper folic acid use and regular antenatal care). The absence of severe cases and overall lower anemia status in this study is a good indicator that if coordinated work is done between stakeholders anemia can be further reduced.

In this study smoking, khat chewing and drinking habits of the pregnant women were assessed and there was no significant trend of smoking and khat chewing but drinking alcohol had been practiced by 100(27.3%) of pregnant women. But drinking alcohol had no significant association with anemia (OR= 2.07 (CI=0.926-4.651, 95%, P value0.076)). This finding was in line with the finding in Tanzania where alcohol consumers were less likely associated with anemia(35). This finding might be due to regular follow up of ante natal care, use of folic acid and the frequency of alcohol consumption (out of alcohol consumers 96% of pregnant women in this finding were drink alcohol occasionally).

Even though at all levels of trimester pregnant women were participated majority of the participants were in their third trimester. This might be because of greater number of pregnant women coming to health facility were near to give birth or gradual improvement in health-seeking behavior of the women so that they could attend antenatal care lately. The study result showed the prevalence of anemia decrease as the months of pregnancy increased. It also indicated that the prevalence of anemia decrease as the number of pregnancy increased. But those variables have no significant association with anemia. This is in contrast with study done in southeast Ethiopia(6) and Debre Birhan health institutes(25). This might be due to antenatal follow up and use of folic acid regularly (within the appointment of the health facilities).

History of bleeding due to accident was significantly associated with anemia. This is to mean that antenatal mother who had previous history of bleeding due to accident are by $OR= 4.2(CI=1.511 - 11.633, 95\%, P\text{ value}=0.006)$ times to exposed to anemia than those who do not have. This finding is similar with the finding in Wolayta Sodo(20)and Tikur Anbessa Hospital, Ethiopia(34). This outcome might be happened due to lack of timely treatment, repeated abortion or lack of awareness to consequences of the disease.

Considering the criteria of Knowledge measurement of this study 41.4% of pregnant women are knowledgeable to anemia and it had a protective effect with $OR=0.36(CI=0.168-0.780, 95\%, P\text{ value of } 0.010)$ indicating that women who had knowledge about anemia are less likely to have anemia compared to their counterparts. This finding is different from the finding done in Debre Birhan(25) and coastal Kochi, Kerala, India (36). This might be due to accessibility of health care system and information availability variation or more study participants had access to education.

6.1. Limitations of the Study

- ❖ Hemoglobin concentration was taken from the secondary data.
- ❖ Due to the cross sectional study design used, whether anemia preceded the predisposing factors or the vice versa could not be verified in this study.

7. CONCLUSION

The overall prevalence of anemia in this study using a cut off level of haemoglobin <11 g/dl was low (13.4%) and it was categorized as a 'mild' type (haemoglobin: 10-10.9 g/dl). Bleeding due to accident during pregnancy and knowledge status of pregnant women has a significant association with anemia during pregnancy.

8. RECOMMENDATIONS

Awareness creation should be done among pregnant women. Further study should be done to differentiate main causes of bleeding. History of bleeding should be assessed during ANC follow up. Mobilization of women in child bearing age in general and give health education about causes and consequences of anemia. Future studies using larger sample size and different study design are needed for a better understanding associated factors of anemia (specially differentiate main causes of bleeding) among pregnant women in the study area.

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ANNEX I Informed Consent Form

Saint Paul Hospital Millennium Medical College Department of Public Health

Study area and Period: Akaki Kality Sub City from October 10-November to 30/ 2017

Title: Anemia and associated factors among pregnant women attending ANC health facility in Akaki Kality Sub City Addis Ababa, Ethiopia.

Introduction: Anaemia is the main problem during pregnancy. The disease can affect every part of the population although the most vulnerable groups are pregnant women especially in developing countries.

Purpose of the study: The research is important to show what the findings look like, what measures will be taken in the future to improve the gaps and give hint for further study that help the sub-city health department and the community including the people who participate in the study.

Objective: to assess anemia and its associated factors among pregnant women attending ANC clinics in Akaki Kality Sub City Addis Ababa, Ethiopia, 2017.

Risk assessment: It will be introduced that there will be no risks to participate in the study.

Benefits: You will not have any direct incentives by participating and your decision to participate in the study and will not affect the service you will get from your ANC facility.

Right: You will be asked about basic information of you and your pregnancy during your current pregnancy. If you are not comfortable you can withdraw at anytime from the study. There is no right or wrong answer to each question.

Privacy: Your personal identifiers will not be written anywhere in the questionnaire and kept strictly by using codes

Confidentiality: whatever information you provide will never be disclosed to the third party except for the purpose of the study.

Good day to you madam, my name is _____ and I am working as a data collector for a study we are conducting in collaboration with department of Public Health, SPHMMC for candidate of MSc fulfillment.

Your participation is voluntary, and you can choose not to participate now or at any time during our data collection. The questioner may take a maximum of 20 minutes.

I need to get your consent to participate on this study. Should you agree to participate?

If you agreed, your laboratory and clinical data will be used and you are kindly requested to put your signature on the following form.

Thank you.

Date_____Code_____ the study is on Anemia and associated factors. I have been briefed that my identity would be kept confidential and the information will be used for the intended purpose only. As my information is important to the study, I agreed to participate in the study. Participant's signature_____ Researcher's signature _____.

For more information, you can reach me at the following address.

Mitiku Seid [Mobile: +251911989261; E-mail: mtkmw2004@gmail.com]

Anne II: Questionnaire

I would like to thank you for giving your consent to participate in the study entitled “anemia and its associated factors among pregnant women attending antenatal care clinic in public health facilities in Akaki Kality sub city, Addis Ababa, Ethiopia,2017”. This questionnaire is designed to collect relevant socio-demographic and related information about pregnant women attending the antenatal clinic in the sub city and participating in the above study. Your response to the study items will highly contribute to the success of the study. Therefore, you are kindly requested to give frank response to each of the items. No need to write your name.

I. Personal Information of Respondents						
1	Unique ID					
2	Age					
3	Address Addis Ababa		Woreda			
4	Marital status(skip Q 6&9 if not married)		Married ☐	Single ☐	Others specify	
5	Occupation	governmental ☐	Private ☐	Housewife ☐	Other	
6	husband's occupation	governmental ☐	Private ☐	Other		
7	Monthly income in Birr					
8	Educational status					
9	Husband's educational status					
10	Number of Family size					
II. Medical History of Respondents						
Have You Ever Faced the Following Health Problems in the last 12 months?						
1	Malaria				Yes ☐	No ☐
2	Bloody diarrhea				Yes ☐	No ☐
3	Chronic kidney disease				Yes ☐	No ☐
4	Intestinal worms				Yes ☐	No ☐
5	HIV				Yes ☐	No ☐
6	Bleeding due to accident				Yes ☐	No ☐
7	Other chronic disease specify _____					
III. Smoking, Alcohol Consumption and Chewing of Khat						
1	Are you smoker?				Yes ☐	No ☐
2	If so, how many cigarettes per day	Occasional ☐	<1 pk ☐	1-2pks ☐	>2pks ☐	
3	Do you drink alcohol?				Yes ☐	No ☐
4	If so, what is the frequency?	Daily ☐	Every Other Day ☐		Occasional ☐	
5	Which kind of alcoholic drinks?	Beer ☐	Traditional drink ☐	Wines ☐	Other Alcohols ☐	
6	Do you chew khat				Yes ☐	No ☐
7	If so, what is the frequency?	Daily ☐	Every Other Day ☐		Occasional ☐	
IV. Maternal Characteristics of Pregnant Women						
1	Months of pregnancy					

2	HB conc. During visit in g/dl			
3	Weight in Kilo gram			
4	Height in Meter			
5	Do you Follow ANC regularly?			Yes ☐ No ☐
6	Did you take Folic Acid			Yes ☐ No ☐
7	If yes how many time in months			
8	Number of pregnancies			
9	Gaps between successive pregnancies in years	1 st &2 nd	2 nd &3 rd	3 rd &4 th
V. Feeding Habit				
1	Do you add at least one additional meal from your non pregnant state?			Yes ☐ No ☐
2	Do you Eat 2 to 3 servings of meat, fish, nuts or legumes, and fish/day?			Yes ☐ No ☐
3	Do you Eat 2 to 3 servings of dairy (milk, eggs, yogurt, and cheese)/day?			Yes ☐ No ☐
4	Do you Eat 2 servings of green vegetables; 1 serving of a yellow vegetable/day?			Yes ☐ No ☐
5	Do you Eat 2 to 3 servings of fruit/day?			Yes ☐ No ☐
6	Do you Eat 3 servings of whole grain breads, cereals, or other high-complex carbohydrates			Yes ☐ No ☐
7	Have you taken all 7 Iron supplement tablets in the past week?			Yes ☐ No ☐
8	Have you decreased your coffee/tea intake during your current pregnancy?			Yes ☐ No ☐
9	Do you take alcohol during pregnancy?			Yes ☐ No ☐
10	Do you increase amount of food to eat during pregnancy?			Yes ☐ No ☐
11	Are you Avoiding one or more food type during pregnancy			Yes ☐ No ☐
12	If yes for question number 10 what food?			
13	Why?			
VI. Knowledge of Hemoglobin Concentration among the Respondents				
1	Do you know your HB concentration			Yes ☐ No ☐
2	HB concentration during follow up in g/dl	1 st _____	2 nd _____	3 rd _____ 4 th _____
3	Do you know about Anaemia?			Yes ☐ No ☐
4	Do you know the causes of Anaemia?			Yes ☐ No ☐
5	From Where do you heard	Media ☐	Health professionals ☐	Family ☐ Friends ☐
6	Is anaemia serious problem during pregnancy?			Yes ☐ No ☐
7	Do you know the prevention methods of Anaemia?			Yes ☐ No ☐
8	Do you believe that ANC follow up decrease problem of anaemia?			Yes ☐ No ☐
9	Do you believe that anaemia is treatable?			Yes ☐ No ☐
10	How can we treat it?			
11	Do you believe that balance diet can decrease problem of anaemia?			Yes ☐ No ☐
12	Other thing you want to say:			

Annex III: Informed Consent Form (Amharic version)

ከቅዱስ ጳውሎስ ሆስፒታል ሚሊኒየም ሜዲካል ኮሌጅ ህብረተሰብ ጤ/ትምህርት ክፍል

ጥናቱ የሚካሄድበት ቦታ እና ጊዜ፡ አቃቁ ቃሊቲ ክፍል ከተማ ህዳር 01-30/ 2010

የጥናቱ ርዕስ፡- የደም ማነስ በሽታ በነፍሰጡር ሴቶች ውስጥ ያለውን የስርጭት ደረጃ እና ተዛማጅ ሁኔታዎችን ለወሊድ ክትትል ወደ ጤና ጣቢያና ሆስፒታል የሚመጡ ሴቶችን ነው፡፡

መግቢያ፡- በርግዝና ወቅት የደም ማነስ በሽታ ከሚከሰቱ ችግሮች አንዱ ነው፡፡ይህ በሽታ ማንኛውንም ሰው ሊያጠቃ ይችላል በነፍሰጡር ሴቶች ላይ ይበረታል በተለይም በታዳጊ አገሮች የባለ ነው፡፡

የጥናቱ ጥቅም፡- የዚህ ጥናት ጥቅም የደም ማነስ በሽታ በነፍሰጡር ሴቶች ውስጥ ያለውን የስርጭት ደረጃ እና ተዛማጅ ሁኔታዎችን ለይቶ በማወቅ አቀቁ ቃሊቲ ከ/ከተማ፣ ህብረተሰቡና ነፍሰጡር እናቶች ችግሩን አውቀው በቀጣይ ምን ማድረግ እንደሚኖርባቸው ይረዳል፡፡

የጥናቱ አላማ፡- የደም ማነስ በሽታ መጠን ምን እንደሚመስልና ተዛማጅ ችግሮችን ለማጥናት ለነፍሰጡር ክትትል በሚመጡ እናቶች ላይ በአቃቁ ቃሊቲ ከ/ከተማ በመንግስት ተቋማት ላይለመስራት ታስቧል፡፡

የጎንዮሽ ችግርን በተመለከተ፡-

የሚያስከትለው ችግር፡- ጥናቱ ላይ በመሳተፍዎ የሚያስከትለው ምንም አይነት የጎንዮሽ ጉዳት አያስከትልም፡፡

የሚያስገኘው ጥቅም፡- ጥናቱ ላይ በመሳተፍዎ የሚያገኙት ቀጥተኛ የተለየ ጥቅም የለም እንዲሁም በሚያገኙት አገልግሎት ላጥ ጠጽኖ የለውም

የግል መብትን በተመለከተ፡- በጥናቱ ላይ መሳተፍ ካልፈለጉ በማንኛውም ሰዓት ማቋረጥ ይችላሉ፡፡

የመረጃ አያያዝን በተመለከተ፡- አያንዳንዱ መረጃ በኮድ ስለሚያዝና ስማችሁ ስለማይፃፍበት ማንም ሊያውቀው አይችልም፡፡

ሚስጥራዊነቱን በተመለከተ፡- በዚህ ጥናት የእናንተ ውጤት ፍጹም ሚስጥራዊነቱን በጠበቀ መልኩ ስለሚያዝ ለሌላ ወገን ተላልፎ አይሰጥም፡፡

Annex IV: Questionnaire (Amharic version)

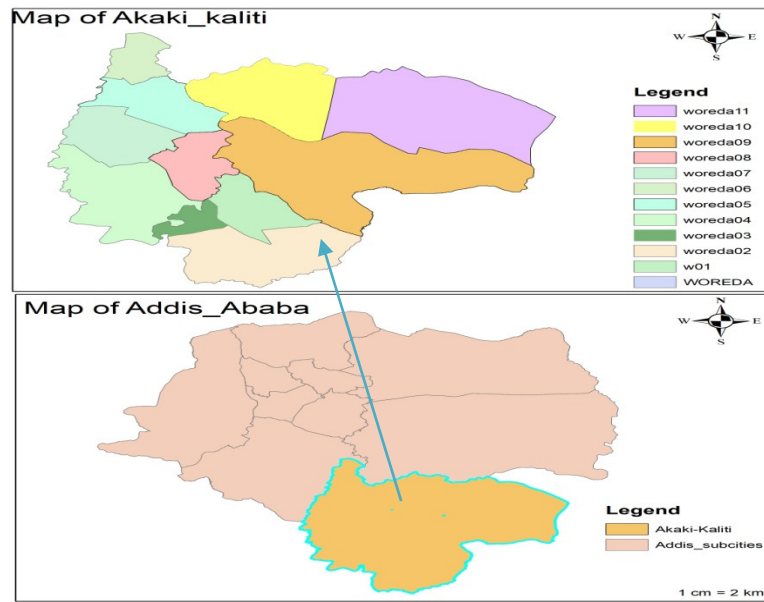
የደም ማነስ በርግዝና ወቅት ያለውን ተጽእኖ ለማጥናት የተዘጋጀ መጠይቅ

በመጀመሪያ በዚህ ጥናት ላይ ተሳታፊ ለመሆን ፍቃደኛ ስለሆኑ አመሰግናለሁ፡፡ይህ ጥናት በነፍሰጡር እናቶች ላይ የሚታየውን የደም ማነስ ወቅታዊ ስርጭትን የሚመለከት ነው፡፡የዚህ ጥናት አላማ የደም ማነስ በሽታ በአዲስ አበባ ከተማ በአቃቄ ቃሊቲ ክፍለ ከተማ በተለያዩ ጤና ተቁዋማት ለክትትል የሚመጡ ነፍሰ ጡር እናቶች ላይ ምን እንደሚመስል ማጥናት ነው፡፡በመሆኑም በመጠይቁ ላይ ያሉትን ጥያቄዎች በሙሉ በመመለስ ጥናቱን ይደግፉ ዘንድ በትህትና እጠይቃለሁ፡፡ በመጠይቁ ላይ ስም መፃፍ አያስፈልግም፡፡ለጥያቄዎቹ የሚሰጡት መልስ ለዚህ ጥናት ብቻ የሚያገለግል ሲሆን ሚስጥራዊነቱ የተጠበቀ ነው፡፡

ሀ. መልስ ሰጪው ግላዊ መረጃ						
1	መለያ ቁጥር					
2	እድሜ					
3	የመኖሪያ አድራሻ አዲስ አበባ		ወረዳ			
4	የጋብቻ ሁኔታ(ካላገቡጥ.ቁ 6ና9ን አይመልሱ)		ያገባች ☐	ያላገባች ☐	ሌላ ካል ይጠቀስ	
5	ስራ	የመንግስት ☐	በግል ☐	የቤት እመቤት ☐	ሌላ	
6	የባለቤትነት ስራ	የመንግስት ☐	በግል ☐	ሌላ		
7	የወር ገቢ መጠን በብር					
8	የትምህርት ደረጃ					
9	የባለቤትነት የትምህርት ደረጃ					
10	የቤተሰብ ብዛት					
ለ. አጠቃላይ የጤና ሁኔታን በተመለከተ ቀጥሎ የተዘረዘሩት የጤና ችግሮች ባለፉት12 ወራት በእርስዎ ላይ ታይተው ነበር ወይ?						
1	የወባ በሽታ				አዎ ☐	የለም ☐
2	ደም የተቀላቀለ ተቅማጥ				አዎ ☐	የለም ☐
3	የቆየ የኩላሊት ህመም				አዎ ☐	የለም ☐
4	የአንጀት ትላትል				አዎ ☐	የለም ☐
5	የኤች.አይ.ቪ.ቫይረስ				አዎ ☐	የለም ☐
6	ድንገተኛ የደም መፍሰስ				አዎ ☐	የለም ☐
7	ሌላ የቆየ የጤና ችግር ካለ ይጠቀስ					
ሐ. ሲጋራ፣የአልኮል መጠጦች፣ ጫት እና ተያያዥ ችግሮችን በተመለከተ						
1	ሲጋራ ያጨሳሉ?				አዎ ☐	የለም ☐
2	አዎን ከሆነ በቀን ስንት ያጨሳሉ?	አልፎ አልፎ	<1ፓክ ☐	1-2ፓክ ☐	>2ፓክ ☐	
3	የአልኮል መጠጦች ይጠጣሉ?				አዎ ☐	የለም ☐
4	አዎን ከሆነ በምን ያህል ድግግሞሽ?	በየዕለቱ ☐	በሁለት ቀን አንዴ ☐	አልፎ አልፎ ☐		
5	ምን አይነት አልኮሆለ?	ቢራ ☐	ባህላዊ መጠጥ ☐	ወይን ☐	ሌላ የአልኮሆል መጠጦች	
6	ጫት ይቅማሉ?				አዎ ☐	የለም ☐
7	አዎን ከሆነ በምን ያህል ድግግሞሽ?	በየዕለቱ ☐	በሁለት ቀን አንዴ ☐	አልፎ አልፎ ☐		

መ. እርግዝናን በተመለከተ							
1	ስንተኛ ወር ላይ ነዎት?						
2	ቁመት በሜትር						
3	ክብደት በኪሎ ግራም						
4	በጉብኝት ወቅት የሄሞግሎቢን መጠን g/dl						
5	የወሊድ ክትትል ሳያቋርጡ ይከታተላሉ?					አዎ ☐	የለም ☐
4	የአይረን እንክብካቤ ይወስዳሉ?					አዎ ☐	የለም ☐
6	አዎ ከሆነ መልስዎት ለምን ያህል ጊዜ						
8	ለስንተኛ ጊዜ ማርገዝዎ ነው?						
9	በእርግዝና መካከል ያለው ርቀት በአመት		በ1ኛና 2ኛ	በ2ኛና 3ኛ	በ3ኛና 4ኛ		
ሠ. አመጋገብን በተመለከተ							
1	ነፍሰጡር ሳይሆኑ በፊት ከሚመገቡዎቸው ምግብ በተጨማሪ ቢያንስ አንድ ተጨማሪ ምግብ ጨምረዋል ወይ?					አዎ ☐	የለም ☐
2	በቀን ከ 2-3 ስጋ/አሳ/ባቄላ/አተር ያለው ማእድ ይመገባሉ?					አዎ ☐	የለም ☐
3	በቀን ከ 2-3 የወተት ተዋፅኦ ያለው (ወተት፣አይብ፣እርን) ማእድ ይመገባሉ?					አዎ ☐	የለም ☐
4	በቀን 2 አረንጓዴ አትክልት ያለው ማእድ ይመገባሉ?					አዎ ☐	የለም ☐
5	በቀን 3 ፍራፍሬ ይመገባሉ?					አዎ ☐	የለም ☐
6	በቀን 3 የጥራጥሬ ዘር ያለው (ዳቦ፣የጥሬ እህል) ማእድ ይመገባሉ?					አዎ ☐	የለም ☐
7	ባለፈው ሳምንት ውስጥ የብረት ንጥረ-ነገር ኪኒንን(አይረን) ሳታቋርጩ በየቀኑ ወስደሻል?					አዎ ☐	የለም ☐
8	በእርግዝዎ ጊዜ ቡናና ሻይ ይወስዱ ከነበረው መጠን ቀንሰዋል?					አዎ ☐	የለም ☐
9	በእርግዝዎ ጊዜ አልኮሆል ይወስዳሉ ወይ?					አዎ ☐	የለም ☐
10	በአሁኑ እርግዝና ወቅት ከሚመገቡት ምግብ በመጠን ጨምረዋል ወይ?					አዎ ☐	የለም ☐
11	በአሁኑ እርግዝና ወቅት ጨርሶ የተዋቸው ምግቦች ነበሩ?					አዎ ☐	የለም ☐
12	ለጥያቄ 10 ምላሹ አዎ ከሆነ ምን አይነት ምግብ?						
13	ለምን?						
ረ. የሄሞግሎቢን መጠን እውቀትን በተመለከተ							
1	በደምዎት ውስጥ ያለውን የሄሞግሎቢን መጠን ያውቃሉ?					አዎ ☐	የለም ☐
2	አዎ ከሆነ ምን ያህል ነው g/dl	1ኛ _____	2ኛ _____	3ኛ _____	4ኛ _____		
3	ስለ ደም ማነስ በሽታ ሰምተው ያውቃሉ?					አዎ ☐	የለም ☐
4	የደም ማነስ በሽታን መንስኤ ያውቃሉ?					አዎ ☐	የለም ☐
5	ከየት ሰሙ?	ከሚዲያ ☐	ከጤና ባለሙያ ☐	ከቤተሰብ ☐	ከጓደኛ ☐		
6	የደም ማነስ በርግዝና ወቅት ዋነኛ ችግር ነው ብለው ያምናሉ?					አዎ ☐	የለም ☐
7	የደም ማነስ መከላከያ መንገዶችን ያውቃሉ?					አዎ ☐	የለም ☐
8	የርግዝና ክትትል የደም ማነስ ይቀንሰዋል ብለው ያምናሉ?					አዎ ☐	የለም ☐
9	የደም ማነስ በሽታ ይድናል ብለው ያምናሉ?					አዎ ☐	የለም ☐
10	እንዴት መዳን ይቻላል?						
11	የተመጣጠነ ምግብ መመገብ የደም ማነስን ይቀንሳል ብለው ያምናሉ?					አዎ ☐	የለም ☐
12	ሌላ የሚሊት ነገር ካለ?						

Annex IIV: Map of Akaki Kality Sub City



Source: Adindan37degreeN

Figure 4: Map of Akaki Kality sub city Administrative 2009(2017), Addis Ababa Ethiopia.