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Dietary Diversity and Associated Factors among Pregnant Women AttendingAntenatal care at Injibara General Hospital, Northwest Ethiopia

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SCHOOL OF RESEARCH AND GRADUATE STUDIES

FACULTY OF CHEMICAL AND FOOD ENGINEERING

DIETARY DIVERSITY AND ASSOCIATED FACTORS AMONG PREGNANT WOMEN ATTENDING ANTE NATAL CARE AT INJIBARA GENERAL HOSPITAL, NORTHWEST ETHIOPIA

BY:

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JUNE, 2020

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Dietary Diversity and Associated Factors among Pregnant Women AttendingAntenatal care at Injibara General Hospital, Northwest Ethiopia

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A Thesis submitted to the School of Research and Postgraduate Studies, Bahir Dar Institute of Technology, Bahir Dar University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Applied Human Nutrition

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DECLARATION

This is to certify that the thesis entitled "**Dietary Diversity and Associated Factors among Pregnant Women Attending Antenatal care at Injibara General Hospital, Northwest Ethiopia**", submitted in partial fulfillment of the requirements for the degree of Master of Science in Applied Human Nutritionunder Faculty of Chemical and Food Engineering,Bahir Dar Institute of Technology , is a record of original work carried out by me and has never been submitted to this or any other institution to get any other degree or certificates. The assistance and help I received during the course of this investigation have been duly acknowledged.

Yeromnesh Tessema_____ _____

Name of the Candidate Signature Date

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We, here by confirm that the changes required by the examiners have been carried out and incorporated in the final thesis.

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As members of the Board of Examiners, we examined this thesis entitled "Dietary Diversity and Associated Factors among Pregnant Women Attending Antenatal care at Injibara General Hospital, Northwest Ethiopia, by Yeromnesh Tessema. We here by certify that the thesis is accepted for fulfilling the requirements for the award of the degree of Master of Science in Applied Human Nutrition

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ABSTRACT

Background: Dietary diversity has been considered a potential 'proxy' indicator to reflect nutrient intake adequacy. It is the measure of food consumption that reflects individual or household access to a variety of foods. However, information on dietary diversity among pregnant women is scarce in the study area.

Objective: To assess dietary diversity and associated factors among pregnant women

Methods:-An institution based cross-sectional study was conducted among 529 pregnant women attending Ante natal care at Injibara General Hospital, Northwest Ethiopia. The study participants were selected using systematic sampling technique. Data were collected using structured interviewer administered questionnaire.A 24-hour dietary recall method was used to collect data on all foods consumed during the last 24 hours before the survey. The food items were categorized into 10 groups to generate dietary diversity score. Descriptive statistics was performed to describe the demographic, socioeconomic and obstetric related factors. Bi-variable and multivariable binary logistic regression models were used to identify independent predictors of dietary diversity. All tests were two sides and$P<0.05$ was used to declare statistical significance.

Results: The proportion of pregnant women who had adequate dietary diversity was 38.2% with 95% (34.2%- 42.5%). On multivariable logistic regression analyses, after adjusting for other variables attending primary education (AOR=0.29, CI: 0.11, 0.71), completed secondary education (AOR =0.21, CI: 0.10, 0.44), being merchant by occupation (AOR =0.39, CI: 0.14, 0.94), husband who had not attend education (AOR=0.08, CI: 0.02, 0.41) and competed secondary education (AOR =0.22, CI: 0.09, 0.51) , being multigravida (AOR= 0.49, CI: 0.27,0.90) and being grand gravida (AOR= 0.24, CI: 0.07,0.82) were negatively associated with having adequate dietary diversity. Conversely, attending ANC services 3 times (AOR=2.45, CI: 1.31, 4.86) and attending 4 & above times (AOR=3.80, CI: 1.79, 8.15) were positively associated with to have adequately dietary diversity.

Conclusion: The prevalence of adequate dietary diversity among pregnant women was low. Maternal educations, husbands' educational, maternal occupation, frequency of pregnancy were independent predictors of having adequately diversified diet among the pregnant women. The findings imply the need for improving women and husbands' educational level, promoting family planning and increasing ANC visit of pregnant mothers are recommended to improve women's adequate dietary diversity.

Key words: Dietary diversity, pregnant women, Injibara, Ethiopia

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ABBREVIATIONS AND ACRONYMS

ANC: Ante Natal Care

AOR: Adjusted Odds Ratio

CI: Confidence Interval

COR: Crude Odds Ration

CSA: Central Statistical Agency

DD Dietary Diversity

DDS: Dietary Diversity Score

EDHS: Ethiopian Demographic and Health Survey

FAO: Food and Agricultural Organization

NNP National Nutrition Program

MDDMaternal Dietary Diversity

MDD-W Minimum Dietary Diversity for Women

SPSS: Statistical Package for Social Sciences

USAID: United States Agency of International Development

WFP: World Food Program

WHO: World Health Organization

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1. INTRODUCTION

1.1 Background of the Study

Dietary diversity is defined as the consumption of an adequate variety of food groups. It also refers to an increase in the variety of foods across and within food groups capable of ensuring adequate intake of essential nutrients that can promote good health, physical and mental development. It is also the measure of food consumption that reflects household access to a variety of foods, and is also a proxy for nutrient adequacy of the diet of individuals (FAO, 2016; Arimond et al., 2010). While information on micronutrient deficiencies is scarce, it is clear that poor micronutrient status among women is a global problem, and is most severe for poor women (Oladoyinbo et *al.*, (2017).

Pregnancy is the most crucial nutritionally demanding period of every woman's life. The high demand of nutrients to deposit energy in the form of new tissue, growth of existing maternal tissues such as breast and uterus and increased energy requirements for tissue synthesis makes pregnant women more vulnerable to malnutrition. Pregnant mothers are living not only for herself but also for their infant and the family (Hundera, 2018).

High nutrient demands of pregnancy put women of reproductive age in developing countries at high risk because consumption of low-quality and monotonous diet is common in these countries and thus these women risk a variety of micronutrient deficiencies (Brinkman *et al*., 2010). Adequate macro and micronutrient intake by the women has important benefits for both pregnant women and their fetus. Women nutrition during pregnancy is important both for fetal development and for protection against maternal morbidity and mortality (Zakaria, 2014).

Consumption of a variety of foods from various food groups has been found to be beneficial for human health, especially for pregnant women. The incidence of dietary inadequacies as a result of dietary habits and patterns in pregnancy is higher when compared to any other stage of the life cycle (Alemayehu, 2014).

1.2. Statement of the Problem

Lack of food diversity is a severe problem among poor populations in the developing world, where diets are based predominantly on starchy staples which lack essential micronutrients and contribute to the burden of malnutrition and micronutrient deficiencies. Unfortunately, in most developing countries micronutrient malnutrition is still a major threat of public health attention. This problem has been attributed to the intake of monotonous cereal based diets that are lacking in diversity. Diets in these countries lack fruits, vegetables and animal source foods (Kiboi *et al.*, 2016).

Globally low quality monotonous diets are the norm. When grain or tuber-based staple foods dominate and diets lack vegetables, fruits, and animal source foods, risk for a variety of micronutrient deficiencies is high (Darnton et *al., 2015,)* .Worldwide, it is estimated that two billions of world population suffer from a chronic deficiency of micronutrients. In many developing countries, especially in South Asia and Africa, macro and micronutrient deficiencies is a significant public health problem. As different findings showed, the overall prevalence of micronutrients deficiency was 38 %, which accounts 36 % in ocean, 27% in Latin America and Caribbean's, 24 % in Europe, 36 % in Asia and 39% in Africa (Nair *et al*., 2016). In Ethiopia, According to 2016 EDHS 24% of reproductive age women are anemic and 35% pregnant women were anemic and 22% reproductive age women are thin/underweight and this pose a number of pregnancy adverse outcomes including abortion, fontal brain damage, congenital malformation, stillbirth, and prenatal death (CSA, 2011; EDHS, 2016

Low dietary diversity during pregnancy has short and long term consequences such as Intra Uterine Growth Restriction (IUGR), low birth weight, preterm birth, prenatal and infant mortality and morbidity. Moreover, short term and path physiologic or metabolic depict that will appear as disorders of child growth and development as well as adult chronic disease (Daba *et al*., 2013).Those most likely to suffer from deficiencies include infants and young children, and adolescent girls and women of reproductive age.

Major factors that contribute to inadequate dietary diversity are socio-cultural, socioeconomic, cultural beliefs, educational status, residence, food insecuritymorbidity (Kiboi *et al*., 2016).One of the major causes of under nutrition in pregnant women is low dietary diversity. In the last two decades, due to dramatic increase in micronutrient deficiency, there was an increased attention for women nutrition during pregnancy .Optimal micronutrient status is essential not only for the health, psychological well-being, and work capacity of women but also for the growth, long-term health, and development of their children (Torheim *et al*., 2010).

Three pronged strategy has been envisaged for prevention and control of hidden hunger, which can be deployed individually or in combination: short-term supplementation, medium-term food fortification, and a long-term focus on dietary diversification (Nair et al., 2016). Ethiopia government also launched National Nutrition Program (NNP I) and NNP II to improvenutritional statuswomen of reproductive age including pregnant women through dietary diversification (NNP II, 2016).

Assessing dietary diversity and its associated factors among pregnant women is vital to improve the quality of diet pregnant women and prevent negative birth outcome. Although there are many studies ondietary diversity of women in reproductive age elsewhere in the globe as well as in Africa, there is a limited of data concerning magnitude of dietary diversity among pregnant women in Ethiopia, especially in Injibara. Therefore, this study is aimed to assess the magnitude of dietary diversity and associated factors among pregnant women attending Injibara General Hospital in North West Ethiopia.

1.3: Objectives of the Study

1.3.1. General objective

- To assess dietary diversity and associated factors among pregnant women attending ANC service Injibara General Hospital, Awi zone, North West Ethiopia

1.3.2. Specific objectives

- To determine the magnitude of adequate dietary diversity among pregnant women attending ANC service at Injibara General Hospital, Awi zone, Northwest Ethiopia.
- To identify factors affecting dietary diversity among pregnant women attending ANC Injibara service at Injibara General Hospital, Awi zone, Northwest Ethiopia.

1.4: Significance of the study

The study will fill information gap on the proportion of pregnant women having diversified diet in the study area. Moreover the findings of this study will help the Ethiopian government to plan for decreasing under nutrition among pregnant women in the country. Specifically, the study will provide useful information for Injibara Town health office to design special education programs on dietary diversity for pregnant women during ANC follow up.

The study is useful to other relevant stakeholders at different hierarchies ranging from woreda to federal level and other organizations working in the promotion of maternal health to implement programs aimed at improving dietary diversity among pregnant women as a way to improve maternal nutritional status in the study area, region and country and other areas with similar circumstances. In addition, this study may serve as reference for other researchers that would like to conduct the same Awi Zone and Amhara Region.

1.5: Scope of the study

The study was carried out among pregnant women (15-49 years) attending Injibara General Hospital in Awi Zone, Amhara national Regional State. All pregnant women who were attending ANC at Injibara general hospital during the study period were included while those with severe illness and referred to for delivery were excluded from this study

2. LITERATURES REVIEW

2.1. Dietary diversity among pregnant Women

The magnitude of dietary diversity among pregnant women varies from country to country and within in country especially the dietary diversity is low in developing countries.

Most diets in developing countries lack vegetables, fruits and animal source foods. According to many studies women of reproductive age are the most vulnerable to suffer from these deficiencies particularly those from resource poor settings. Pregnant women specially are at a higher risk for nutritional diversity due to their increased nutrient needs (Arimond*et al*., 2010; Saaka, 2013).

A cross sectional study conducted in Malaysia showed that the prevalence of low, medium and highest dietary diversity were 1%, 21.7% and 77.3% respectively (Mirsanjari *et al*., (2012). Moreover, study finding from India revealed that 67% of the pregnant women had good dietary diversity while the rest 33% of them had low dietary diversity score (Rammohan, 2017).

In study in Nepal showed that 74.4% of the pregnant women had good dietary diversity. The majority of women in Nepal consumed cereals at least once per day, pulses/legumes and vegetables three times a week, meat and meat products and fruits once a week. About 30% of women consumed milk and milk products once per day (Bhandari*et al*., 2016). In another cross sectional study carried out in Vietnam, Pakistan and Bangladesh the mean women dietary diversity were 4.6, 6.17±0.99, 2.1 (±1.1) respectively (Nguyen *et al*.,2017; Klemm *et al*., 2015).

A cross sectional study in Kenya in 2013 reported that half of the pregnant women were having high dietary diversity score>5. Majority of respondent had eaten food made from cereals and grains such as corn/maize, rice, sorghum, millet. Another study from the

same country showed 85.5% of pregnant women had high dietary diversity (Saaka, 2013; Zakaria, 2014).

Another cross sectional study carried out in Kenya stated that mean dietary diversity score was 6.84 ± (1.46 SD). Almost 60.6% of the respondents were in the high dietary diversity tercile (=6 food groups). Additionally, 37% and 2.4% of the respondents were in the medium (4-5 food groups) and low dietary diversity tercile (=3 food groups) respectively. In this study, the most commonly eaten foods were cereals (99.2%) and the least consumed foods were animal origin. With respect to food frequency, around 17.3% of the respondents were noted to have a meal frequency of below 3 times per day (Saaka, 2013; Willy, 2016)

In Ethiopia few studies had been conducted to assess the magnitude of dietary diversity among pregnant women. Study conducted in south part of Ethiopia in 2012 at Wondogenet revealed that 34% of pregnant women had inadequate dietary diversity. More than two fifth (41.8%) and nearly two fifth (37.3 %) of the respondents reported that they consumed cereal based foods, beans and peas followed by roots and tubers (28.8 %) (Desalegn *et al*., 2015).

A cross sectional study on dietary diversity and associated factors among Pregnant Women attending ANC services at public health facilities in Bale zone , southeast Ethiopia revealed that 44.8% of the pregnant women had adequate dietary diversity(Sintayehu & Bedasa.,2019).

Study conducted in north eastern Ethiopia, at Jille Tumuga district among 647 pregnant women revealed that 31.4 % of pregnant women had adequate dietary diversity. Cereals were the most commonly consumed food group (Seid*et al*., 2015).In addition to this, a Study done in Shashemene reported that 25.4 % of pregnant women had achieved adequate dietary diversity (Melaku *et al*., 2019)

2.2. Factors Associated with dietary diversity among pregnant women

Empirical studies had revealed different factor influencing dietary diversity of pregnant women. The most and commonly cited factors associated with dietary diversity of pregnant women were socio-demographic, socio-economic, Obstetrics, maternal, cultural factors and household food security status.

2.2.1. Socio-Demographic Factors

In many empirical studies age, marital status, ethnicity, religion, place of residence, family size, educational level of the mother and the husband, occupation of the mother and husband's occupation has been considered as socio-demographic factors affecting dietary diversity of pregnant women.

A study in Pakistan, asserted that age and women occupation has no association with pregnant women dietary score (Northstone, 2007; Ali, 2014).In Bangladesh women education and being a wage earner wereassociated with dietary diversity during pregnancy. The same study further revealed that women who had completed secondary or higher level of education were 2.5 times more likely to have high dietary diversity than women who had no formal education(Klemm *et al*., 2015).

Pregnant women from a larger family size (more than 5 household members) were nearly 2 times more likely to have high dietary diversity compared from those who had smaller family size (less than 3 members) (Nguyen,*et al*.,2017; Shamim, 2016).

Study carried out in Ghana showed that low education level and unemployment were associated with poor dietary diversity of pregnant women**.** Dietary patterns have been shown to vary according to demographic profiles including marital status and level of education. Less education is directly associated with poorer food(Méjean, 2010).

A study done in western part of Ethiopia revealed that mother's occupation and place of residence of the respondent have significant association with dietary diversity of women. Family size had strong statistical association with dietary diversity with pregnant women.

Whereas, age, educational level of women, income, husbands educational level have no association with maternal dietary diversity (Daba, 2013). A cross sectional study conducted in Southern Ethiopia showed that women who had higher number of completed school years were associated with adequate dietary diversity during pregnancy (Zerfu, 2016).

2.2.2. Socio-Economic Factors

Food security and wealth index has been considered as socio-economic factors influencing the dietary diversity of the pregnant women. A cross-sectional study carried out on Japanese pregnant women found that individuals with a higher socio economic position were found to consume diets that were considered to be of a higher quality than those with a lower socio economic position. Other studies have shown that families which have greater incomes and resources tend to have more diverse diets as food access is determined by income and the prices of foods (Murakami,2009; Brinkman,2009)

A study on Mexican women also revealed a strong association between dietary diversity and socio-economic status of a household (Arimond. 2004). Husbands' income and occupation has an impact on the dietary diversity of the women and the same study in Bangladesh showed that pregnant women whose husbands income is high and engaged in business experienced 2 times more likely to have high dietary diversity than women whose husbands were daily wage earners and other occupation.

In a study conducted in North West Ethiopia Husband's income and ownership of radio were shown to have significant association with dietary diversity (Belete, 2016). Other studies also showed that women which have greater incomes and resources more likely to have more diverse diets, since income and the prices of foods determine food access (Brinkman *et al.*, 2009).

A study carried out in Gambela by, Ethiopia, argued that pregnant women who were from food insecure households were more likely to be undernourished compared to pregnant women who were from food secure households (Mamo, 2018]

2.2.3. Obstetrics Factors

Obstetrics factors such as ANC, Parity, gravidity and Illness have their own effect on dietary diversity.Studies show that increases in parity are more prone to an unhealthy non-diverse diet. A study done in western part of Ethiopia revealed that previous number of pregnancy called gravidity has significant association with dietary diversity of women (Belete, 2016).

2.2.4. Cultural Factors

Sometimes cultural factors like food taboos are some of the most prevalent causes affecting dietary diversity and nutritional status of pregnant women in many developing countries. Pregnant women's dietary behaviors and intake during pregnancy are strongly influenced by different cultural practices, myths and taboos.

Culture which is the acceptable way of life of a community of individuals has been found to be very diverse across the world. There have been long term changes in terms of values, norms and even behavior by individuals and the changes include changes in diet and lifestyle. Pregnant women in various parts of the world are forced to abstain from nutritious foods due to traditional food habits even if the foods are available in abundance. A study done in India in 2010 shows that 63.7 percent of the study population said that some vegetables/fruits should be avoided during pregnancy (Patil *et al*., 2014). Many studies have reported that foods are characterized as both hot and cold; hot foods are avoided as they are thought to cause abortion and cold foods are preferred (Zobairi *et al*., 2016)

Tadese et al., (2016) in their study in Arsi, Central, Ethiopia, has identified green leafy vegetables, yogurt, cheese, sugar cane and green appear as the most common taboos related to consumption during pregnancy due to fear ofpossible obstructed labor associated with the delivery of a bigger baby.

Tsegaye et al (1996), in their cross sectional study in Hadiya Zone, Ethiopia, on food taboos among pregnant women, indicated that almost a little over a quarter of them (27%) avoided at let one type of food due to food taboos. Milk and cheese were regarded as taboo b[foods by nearly half of the women (44%) followed by linseed and fatty

meat(16% ,11.1% respectively). According to their study, the reasons for avoiding these foods include fear of difficult delivery (51%), discoloration of the fetus920%) and fear of abortion (7%).

Overall, the importance of dietary diversity for pregnant women cannot be overlooked considering the fact that it significantly influences both the nutritional status of the mother and the foetal- outcome. Various studies conducted in different parts of the world indicated that the magnitude of dietary diversity among pregnant women various from country to country and especially the dietary diversity are low in developing countries since diet of pregnant women in developing countries lack vegetables, fruits and animal source foods. Inconsistency of factor influencing dietary diversity of pregnant women was reported from the literature.

Conceptual frame works

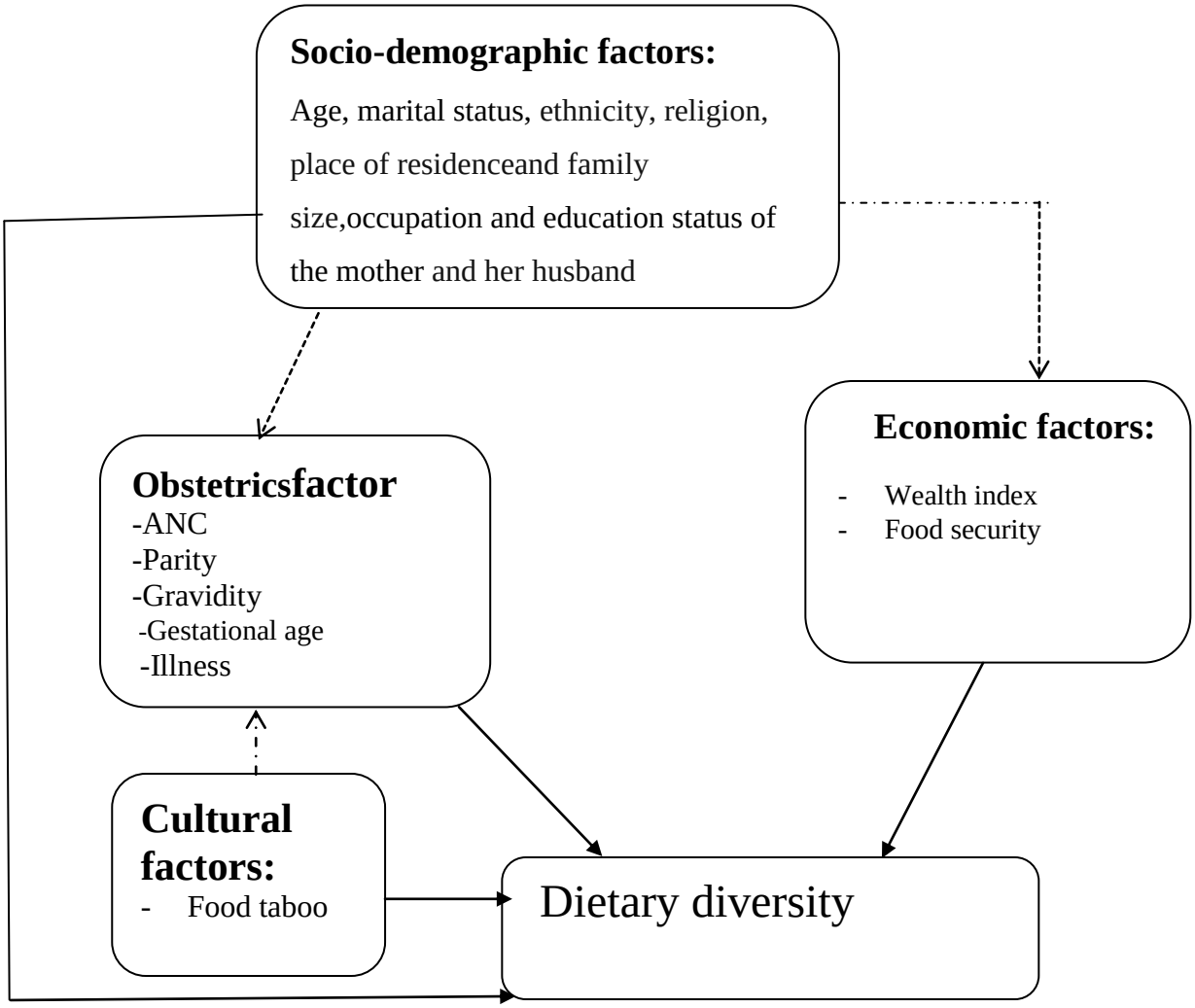

Figure-1: Conceptual framework of determinants of dietary diversity of pregnant women

Source: Modified and adopted from UNICEF and previously studied literatures.

3. METHODS

3.1 Study Area and Period

This study was conducted at Injibara general hospital, located at Injibara Town;Injibara is the administrative center of Awi Zone in Amhara National Regional State. Injibara Town is located at 441km from Addis Ababa to the north-west. According to the figures from the 2014 census projection, the population of Awi zone is estimated at 1,143,639 of which 571,821 (50.01%) are males and 571,818 (49.99%) are females. Of the total population 884,928 (86.9%) are rural while the rest 133,471 (13.1% are urban residents. According to Injibara town Health Office, the town administration has one general hospital, one health Center, seven private medium clinics and 13 drug stores.Thus, Injibara general hospital serves both rural and urban residents. The study was conducted from September 28/2019 to November 23/ /2019.

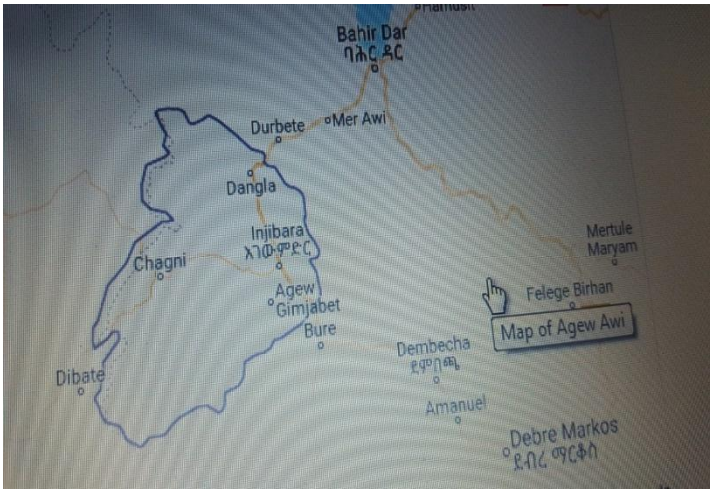

Figure 2: Map of the study area, Awi Zone

Source: Awi-Zone tourism department, 2018

3.2: Study Design

An institution based cross sectional study design was used.

3.3. Population

3.3.1. Source population

All pregnant women attending ANC services in Injibara General Hospital was used source of the population for the study.

3.3.2: Study population

All pregnant women who visitedInjibara general hospital to attend ANC serviceduring the study period

3.3.3: Inclusion criteria

All pregnant women who were attending ANC at Injibara general hospital during the study periodwere included

3.3.3: exclusion criteria

Pregnant women with severe illness and those who werereferred to from other health facilities for delivery were excluded from this study.

3.4. Sample size determination

3.4.1: Sample size determination for the first objective

The required sample size for this study was calculated by using the single population proportions formula. The prevalence (31.4%) was taken from a study conductedpreviously on pregnant women's dietary diversityin Jille Tumuga district, North east Ethiopia (Seid *et al*., 2019). The sample size calculatedas shown below.

$$n = \frac{(z)2\ pq}{(d)^2} = \frac{(1.96)2x0.314x0.686}{(0.05)^2} = \frac{0.827}{0.0025} = \mathbf{330}$$

Where

n = Minimum sample size for a statistically significant survey

Z = Normal deviant at the portion of 95% confidence interval two tailed test = 1.96

P = proportion of dietary diversity among pregnant women (31.4%)

q= 1-p

d= margin of error acceptable is taken as 5%= 0.05

The calculated sample size was 330. By adding 10% nonresponse rates, the final sample size was 363.

3.4.2: Sample Size Determination for the Second Objective

The sample size for the second objective was determined by Epi info version 7.2. Software using the following assumptions

Table 1: Sample size determination for factors associated with dietary diversity among pregnant women attending ANC in Injibara general hospital

Predictors	Proportion value (% of exposed)	Proportion value (% of Unexposed	CI	Power	AOR	Ratio of exposed to unexposed	Non response rate	Sample size	Reference
Wealth index	43.1	28.4	95	80	1.86	1	10%	360 (396)	Seid,et al,2019
Place of residence	29.4	54.8	95	80	3.72	1	10%	132 (146)	(Sintayehu&bedsa, 2018)
Mother educational status	39.3	26.9	95	80	1.93	1	10%	482 (531)	Seid,et al,2019

Sample size calculated for the second objective was larger. Therefore, by considering non-response rate 10% of sample obtained from above table, 482 X 10% = 49. So, the final sample size of this study was 482+49=531.

3.5. Sampling techniques and procedure

The study participants were selected using systematic sampling method based on the number of ANC attendants within the last two month prior to data collection. The number of pregnant mother who came for ANC services was 1300. The interval$k^{th}$was calculated byN/n = 1300/531 ~3. Then study participants were selected at every third interval after the first client was selected. The first pregnant woman was selected

randomly within the sampling interval and then the subsequent mothers were selected by adding the sampling interval 3.

3.6. Study variables

3.6.1. Dependent variable

Dietary diversity (adequate, inadequate)

3.6.2. Independent Variables

Factors affecting the dietary diversity of pregnant women were considered as independent variables. As shown in conceptual framework, these variables have been categorized as socio-demographic, economic, obstetric,and cultural factors.

Socio-demographic variables: Age, marital status, ethnicity, religion, place of residenceand family size, occupation and education status of the mother and her husband

Economic variables: Food Security and Wealth index

Obstetric related factors: ANC, parity, gravidity, gestational age, illness

Cultural factors: food taboo

3.7. Term and operational definition

Dietary diversity is defined as the number of different foods or food groups consumed over a given reference period (FAO, 2016).

Dietary diversity score is the number of food groups consumed by pregnant women out of the ten food groups and computed by summing up the number of food groups consumed over 24 hour period

Adequate dietary diversity: When pregnant women's consume five or more food groups over the last 24 hours, (FAO, 2016).

Household's wealth index measuring tool was adopted from EDHS 2016. It was analyzed using Principal Component Analysis (PCA) by considering the household assets, such as livestock, type of house, durable assets, productive assets and agricultural land ownership. First, variables were coded between 0 and 1.

Principal component analyses was conducted to generate wealth index after checking all assumptions such as sample adequacy (KMO $\geq$ 0.5, Antiimage $\geq$ 0.5 and Communality

≥0.5, Bartlets test of Sphericity (P<0.05) and absence of variable with complex structure. Finally, the factor scores were summed and ranked into tertiles as poor, medium and rich.

Food insecure household: Households those experience inability to access sufficient food at all time to lead an active and healthy life (includes all stages of food insecurity; mild, moderate and severe) (Coates *et al.*, 2007).

3.8.Data collection Instrument and measurement

A structured questionnaire was used to assess dietary diversity of pregnant women. It includes socio-demographic, economic, obstetric, and cultural characteristics of pregnant women and dietary related issues. The questionnaire was adapted from previous literature(Seid *et al*., 2019; Melaku *et al*., 2019). It wasdeveloped in English language then translated into Amharic and Awgni languages by trilingual experts. It was further translated into English for consistency of meaning.

A 24-hour dietary recall was used to collect dietary data. The respondents were asked to recall all foods eaten and beverages taken in the previous twenty four hours prior to the interview date according to Food and Agriculture Organization guideline (FAO, 2016).

The foods were categorized into10 food groups:

1. Grains, white roots and tubers, and plantains
2. Pulses (beans, peas and lentils)
3. Nuts and seeds
4. Dairy
5. Meat, poultry and fish
6. Eggs
7. Dark green leafy vegetables
8. Other vitamin A-rich fruits and vegetables
9. Other vegetables
10. Other fruits

3.9. Data quality control technique

A structured questionnaire was adapted from a validated and modified individual dietary diversity questionnaire as recommended by the Food and Agriculture Organization

individual and household dietary diversity guideline (FAO, 2016) and other related literature [Melaku *et al*., 2019].

A structured interviewer administered questionnaire was first prepared in English and translated in to Amharic and Awgni for data collection. Then questionnaires were translated back to English by language expert in order to ensure its consistency.

One day training was given for four data collectors (nurses) (all with degree) and one doctor who served as a supervisor. The training was focused on interview technique, ethical issues, rights of the participants, reading through all the questions and understanding them and ways of decreasing under-reporting and maintaining confidentiality.

Pre-test was conducted one week before the actual data collection, to test the questionnaire at Dangila primary hospital which is outside of the study area on 5% of the total sample size to ensure the validity of the tool.

After the pre-test, some adjustments were made. Intensive supervision was done by principal investigator and supervisor and the collected data was checked for completeness, accuracy, and consistency throughout the data collection period.

3.10. Data management and analysis

The data were coded, entered and cleaned using EPI INFO version 7. Then, it was exported and analyzed using Statistical Package for Social Science (SPSS) version 20. Descriptive statistics such as frequency, distribution mean and percentages were computed to describe the demographic, socio-economic obstetricand food taboocharacteristics of the respondents. Binary logistic regression analysis was used to assess the effect of independent variables on the dependent variable.

Variable with P values <0.2 in bi-variable logistic regression model was used as candidates for entry into the multivariable logistic regression model. Variables with p-value <0.05 weredeclared as having significant association with the dependent variable. The results were presented using Adjusted Odds Ratio (AOR) at 95% Confidence intervals. Multi-collinearity was checked using variance inflation factor (VIF) standard error of >2. Model fitness was checked by Hosmer Lemeshaw Test (P>0.05).

3.11. Ethical considerations

Before starting the data collection, ethical clearance was secured from Amhara Public Health Instituteand then permission was obtained from Injibara General Hospital. Then the consent was taken from each study participantand pregnant women under18 age with consent from her husband or her parents. At most confidentiality of the information collected from each study participant was maintained. The participants were informed that they have full right to withdraw from the study at any time if they face any difficulties and inconvenience. In addition, the name of the study subjects was not included in the questionnaire.

3.12. Dissemination of results

The findings of this study will be presented and disseminated for relevant bodies at differ conferences and workshops, including those that will be organized by Bahir Dar University, and Amhara regional health bureau. Manuscripts will be prepared out of the thesis and sent for publication in peer-reviewed journals.

4. RESULTSAND DISCUSSION

4.1 Socio-Demographic and Economic Characteristics

A total of 529 pregnant women were participated in this study with a response rate of 99.6%.. The mean age of the participants was 27.4 (± 5.2) yearsand above half of them (60.5%) were within age group of 25-34 years. Most of the participants (97.9%) were married.Nearly one in five women, 19.3% of the respondents didn't attend any formal education.Less than half, 42.3% of the respondentsand 43.7% of their husbands had above secondary education. With respect to respondent's occupation, 47.3% were house wives, 28.7% government employed, 10% merchants and 14% farmer. The wealth index showed that one third (32.5%) of the respondents were in the rich category. Majority of the respondents, 84.7 % were residing in food secure households(**Table2**).

Table2.Characteristics of the pregnant women attending ANC at Injibara Hospital(N=529)

Variables	Categories	Frequency	Percent
Age of mother	18-24	146	27.6
	25-34	320	60.5
	35-49	63	11.9
Marital status	Married	518	97.9
	Divorced/windowed	11	2.1
Religion	Orthodox	509	96.2
	Protestant /Muslim	20	3.8
Ethnicity	Agew	319	60.3
	Amhara	210	39.7
Residence	Urban	407	76.9
	Rural	122	23.1
Family size	<= 4	389	73.5
	>4	140	26.5
Mother's educational level	No formal education	102	19.3
	Primary	81	15.3
	Secondary	123	23.2
	College and above	223	42.2
Husband'seducationlevel	No formal education	91	17.6
(n=518)	Primary	73	14.1
	Secondary	127	24.5
	College and above	227	43.8

Mother's occupation	House wife	250	47.3
	Farmer	74	14.0
	Governmental employee	152	28.7
	Merchant /any business	53	10.0
Husband's occupation(n=518)	Farmer	103	19.9
	Governmental employee	212	40.9
	Merchant	188	36.3
	Daily labor	15	2.9
Wealth index	Poor	175	33.1
	Medium	182	34.4
	Rich	172	32.5
House hold food insecurity	Secured	448	84.7
Insecure81	15.3		

4.2. Obstetrics characteristics of respondents

One third of the respondents, 33.3% had first pregnancy and 51.8 % of women had one to three previous deliveries. With respect to gestation period, almost half of the respondents (49.5%) were third trimester pregnant. Concerning to antenatal care practiceone fourth of the study participants (26.8 %) had attended only once and 25.5 % of pregnant women had attended four times and more (**Table-3).**

Table 3: Obstetrics characteristics of respondentsof the pregnant women attending ANC at Injibara Hospital, North west Ethiopia(N=529)

Variables	**Categories**	**Frequency**	**Percent**
Gravidity	Primigravida	176	33.3
	Multigravida	288	54.4
	Grand gravida	65	12.3
Parity	Null parity	188	35.5
	Primi-parity	144	27.2
	Multi parity	197	37.3
Gestational age	Frist trimester	53	10.0
	Second trimester	214	40.5
	Third trimester	262	49.5

Number of ANC	Frist visit	142	26.9
	Second visit	118	22.3
	Third visit	134	25.3
	Four and above	135	25.5
illness within 2 weeks	Yes	330	62.4
	No	199	37.6

4.3. Cultural Factors

Nearly one third 29.1 % of the respondents had avoided certain foods during pregnancy. Over half (55 %) of themavoid food due to fear of abortion.

Table 4: Dietary diversity and Cultural factorsof the pregnant women attending ANC Injibara Hospital, North west Ethiopia (N=529)

Variables	**Categories**	**Frequency**	**Percent (%)**
Any food avoidance	Yes	154	29.1
	No	375	70.9
Type of food that avoided	Pumpkins	24	15.6
	Avocado	7	4.5
	Oat (Aja)	27	17.6
Reason for restriction	Fear of big baby	31	20.0
	Fear of abortion	85	55.0
	Culturally unacceptable	25	16.0
	Don’t known	14	9.0

4.4 Dietary Diversity

Out of the 10 food groups, the mean dietary diversity score among pregnant women was 4.43 ± 1.70 SD with scores ranging from 1 to 8 food groups. Overall, only 38.2% of pregnant women had received adequate dietary diversity (Figure 3). The most commonly consumed food groups were cereals (97.4%) followed by pulses (80.3%) and other vegetables (69.6%) respectively. Moreover, foods of the animal product were minimally consumed;only15.9 %, 14.7 % and 4% of the women took meat, dairy products and egg respectively (Figure 4).

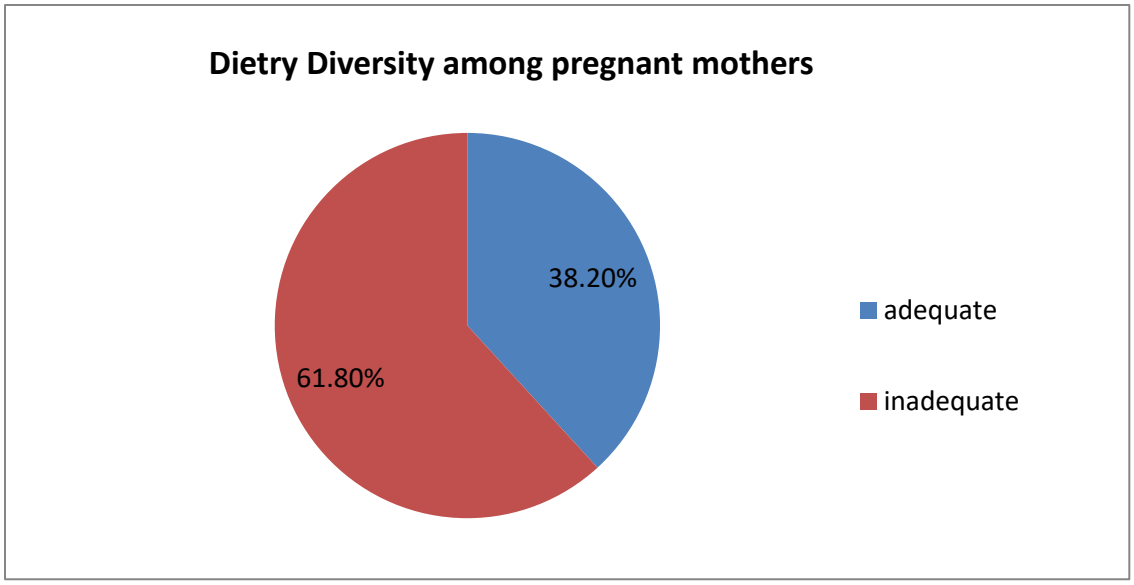

Figure 3: Proportion of pregnant women attending ANC Injibara Hospital, North west Ethiopia, having adequate dietary diversity

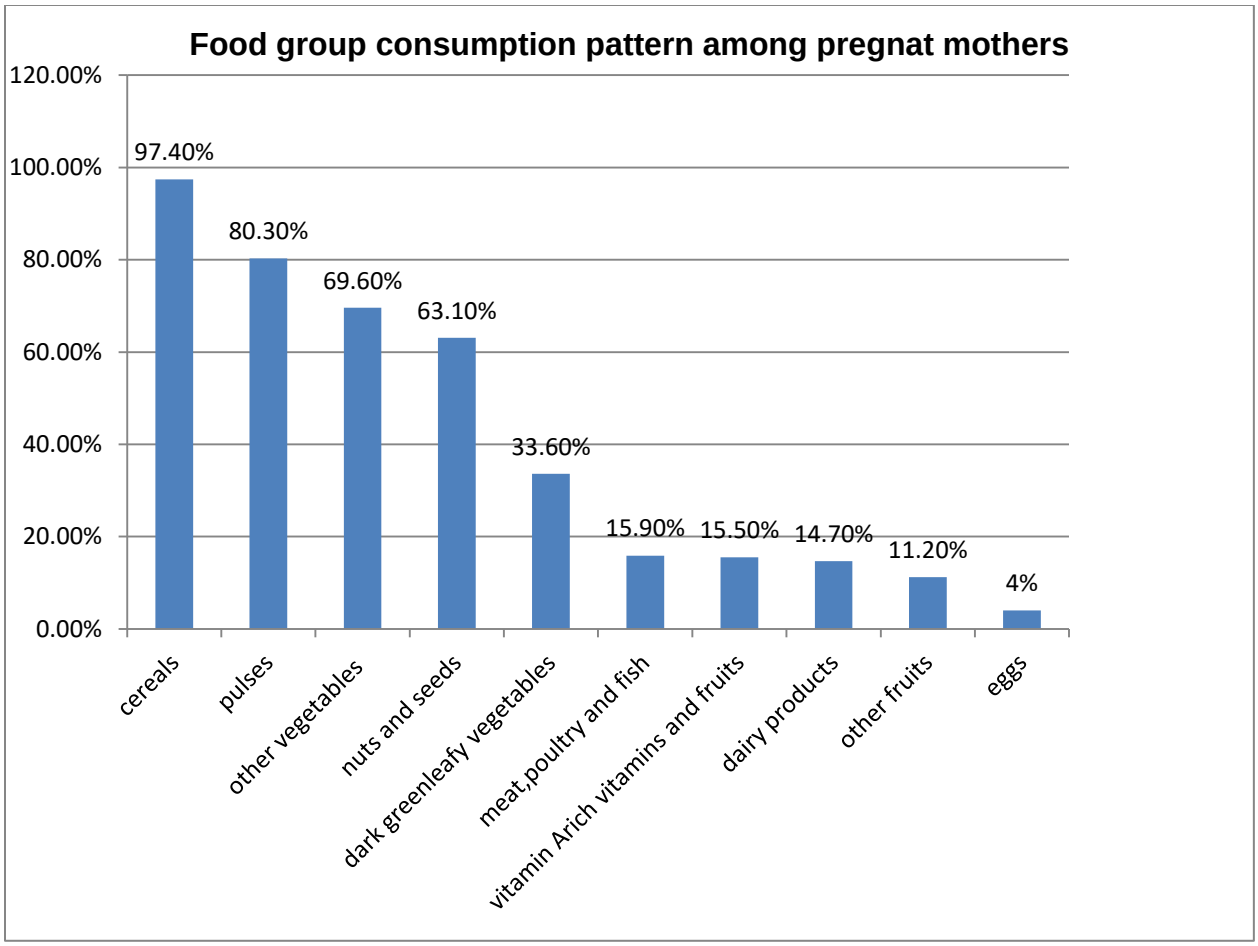

Figure 4: Food group pattern among consumption pregnant women attending ANC Injibara Hospital, North west, Ethiopia

4.5 Factors Associated with dietary Diversity of Pregnant Women

The association of dependent and independent variables were explained by both bi-variable

and multivariable binary logistic regressions. Accordingly; bi-variable analysis age of the mother, residence, mothers' educational level, husband's educational level, mother's occupation , husband's occupation, gravidity, gestational age and number of ANC services had $p < 0.2$ and entered into multivariable logistic regression for further analysis. The multivariable analysis showed that educational level of the mother and the husband, mother's occupation, gravidity and number of ANC services were significantly associated factors with dietary diversity (Table 5).

The likelihood of having adequate dietary diversity practice was 71% (AOR= 0.29, CI: 0.11, 0.71) and 79% (AOR =0.21, CI: 0.10, 0.44) lower in pregnant women had primary education and secondary education, respectively compared to those who had college and above education. Merchant mothers had 61% lower odds of having adequate dietary diversity (AOR =0.39, CI: 0.14, 0.94) compared to house wife mothers.

Likewise, pregnant mothers whose husband had not attended formal education and secondary education had 92% (AOR =0.08, CI: 0.02, 0.41) and 78% (AOR =0.22, CI: 0.09, 0.51) lower odds of having adequate dietary diversity practice respectively thanwomen who had college and above education. Similarly, the odds of adequate dietary diversity practice were 51% (AOR= 0.49, CI: 0.27, 0.90) and 76% (AOR= 0.24, CI: 0.07, 0.82) multi gravida women and grand gravida respectively compared to those primi - gravida women.

Conversely, pregnant women who attended ANC services three times (AOR=2.45, CI: 1.31, 4.86) and four &above (AOR=3.80, CI: 1.79, 8.15) had 2.45 and 3.80 times more likely to achieve the adequate dietary diversity respectively, as compared to those who had first ANC.

Table 5: Factors associated with dietary diversity of pregnant women attending ANC Injibara Hospital, North west, Ethiopia (N=518)

Variable	Dietary Diversity			
	Adequate	Inadequate	COR (95%)	AOR (95%CI)
Age of mother				
18-24	62	84	1.00	1.00
25-34	130	179	0.98(0.67-1.47)	0.97(0.50-1.86)
35-49	8	55	0.20(0.09-0.44)	4.57(0.87-23.98)
Residence				
Rural	24	98	0.31(0.19-0.50)	0.51(0.12-2.15)
Urban	176	220	1.00	1.00
Mother's Educational level				
No education	20	76	0.17(0.10-0.30)	1.26 (0.32-4.93)
Primary	21	59	0.23(0.13-0.41)	**0.29(0.11-0.71)***
Secondary	26	96	0.18(0.11-0.30)	**0.21(0.10-0.44) ****
College and above	133	87	1.00	1.00
Husband's education level				
No education	15	73	0.17(0.09-0.31)	**0.08(0.02-0.41)***
Primary	32	42	0.62(0.36-1.05)	1.66(0.55-4.97)
Secondary	27	101	0.22(0.13-0.36)	**0.22(0.09-0.51)***
College and above	126	102	1.00	**1.00**
Occupation of Mother				
House wife	84	158	1.00	1.00
Farmer	10	64	0.29(0.14-0.60)	0.41(0.10-1.65)
Government employee	96	54	3.34(2.19-5.11)	1.73(0.96-3.32)
Merchant/any business	10	42	0.45(0.21-0.94)	**0.39(0.14-0.94)***
Husband's Occupation				
Farmer	16	89	1.00	1.00
Government employee	113	100	6.29(3.46-11.41)	2.04(0.31-12.4)
Merchant	63	124	2.83(1.53-5.21)	3.63(0.69-20.18)
Daily labor	8	5	8.90 (2.58-30.68)	3.20(0.93-7.98)

Gravidity				
Primi gravida	84	90	1.00	1.00
Multi gravida	105	180	0.63(0.43-0.92)	**0.49(0.27-0.90)***
Grand gravida	11	48	0.25(0.12-0.50)	**0.24(0.07-0.82)***
Gestational age				
Frist trimester	25	27	1.00	1.00
Second trimester	85	122	0.75(0.41-1.39)	0.75(0.29-1.95)
Third trimester	90	169	0.58(0.32-1.05)	0.42(0.15-1.11)
Number of ANC				
Frist visit	40	95	1.00	1.00
Second visit	55	63	0.62(0.37-1.02)	0.89(0.42-1.86)
Third visit	51	81	1.28(0.77-2.10)	**2.45(1.31-4.86)****
Four and above visit	54	79	2.22(1.33-3.72)	**3.80(1.79-8.15)***

CI: Confidence interval, AOR: adjusted odds ratio, 1.00: Reference category,

*: $0.001<p< 0.05$, **: $p\leq0.001$

4.5. Discussion

Maternal dietary diversity is a proxy measure of nutrient adequacy and diet quality that determines the nutritional status of women and their pregnancy outcome. This study aimed to assess dietary diversity and associated factors among pregnant women attending ANC at Injibara General Hospital, North West, Ethiopia.

Accordingly; this study found that only 38.2% (34.2%-42.5%)of pregnant women haveadequate dietary diversity.This figure is nearly similar with study in Wondogenet 34% (Desalegn, *et al*., 2015).But, this finding is lower than studies done in Malaysia 77.3% (Rammohan, 2017), Nepal 74.4% (Bhandari*et al*., 2016) and Kenya 60.6 % (Saaka, (2013; Willy, 2016).

On the other hand, this result is lower than studies conducted in Shashemene 25.4%(Melaku, M., *et al*., 2019) and Jille Tumuga district, North east Ethiopia 31.4%(Seid*et al*., 2015).The possible reason for this discrepancy may be due to difference with respect to socio demographic, socio-economic and health characteristics of the population, sample size variation, accessibility of food, data collection period, geographical area, agro-economic practices, difference in culture of a community, individual's dietary preference and seasonal variation in food production and consumption.

In this study, nearly all (97.4%) the pregnant mothers had consumed cereal, grain and tubers followed by pulses (80.3%). Conversely, animal products like milk and milk products, meat, fish and egg group were least consumed groups. This finding is almost consistent with findings ofother studies done in Shashemene(Melaku Desta et al., 2019) .This might be dueto the fact that cereals and grains are the commonest and relatively cheaper than animal products. In addition to this, animal source foods consumed with seasonal variability. Since dairy products milk and milk products are accessible almost only during summer season and utilization of animal products is mainly on the holiday and ceremonies. Furthermore,significant number of participants report very minimal consumption of other fruits and vitamin A rich fruits and vegetables. The possible reason might be lack of awareness about health benefits of these food items and individual food preference.

The educational level of women and their husbands are the predictors of adequate dietary diversity. Women who had less than secondary education were less likely to have adequate dietary diversity. This is in line with studies done in Shashemene (Melaku, *et al*., 2019) andJille Tumuga district , north east Ethiopia (Seid, *et al*., 2019). This might be due to the high probability of educated women to get information about the benefits of taking diversified food.

Another explanation is educated women are more likely to understand and exercise healthy eating habits than their counter parts. And also,educated women have higher probability of decision making on utilization of available resources which in turn improve purchasing power and their diet quality. Moreover, educated women can have better employment opportunity and income which can further improve their household food security status and consumption of diversified food. Furthermore, the pregnant mothers whose husband had no education and secondary education had lower odds of having dietary diversity.

This finding is supported by study done in Bangladesh (Nguyen et al., 2017). This could be possibly due to that educated husbands can have better employment opportunitywhich improves household income and food security. Besides, educated husbands had better knowledge on the benefits of taking diversified food and support their wives to consume diversified food.

Mother's occupation was significantly associated with pregnant women's dietary diversity. Merchant mothers were less likely to have adequate dietary diversity as compared to house wife mothers. This is similar with studies done in Guto Gida Woreda (Daba, 2013). This might be due to house wife mother have enough time for food preparation and buy foods in different markets.

Dietary diversity of pregnant women was significantly associated with number of pregnancy.The odds of taking diversified food decreased with increased gravidity. This finding is consistent with study donein Bangladesh(Shamim et al., 2016).This might be due to the high probability of multigravida mothers to have large family size.Women in

the household with large family size might face resource constraint to take diversified food. According to this study, the likelihood of having diversified food increased with increased number of ANC visit.This finding is supported by study done in Shashemene (Melaku, *et al*., 2019). The possible justification might be due to the higher probability of women getting counseling regarding the benefits of taking diversified foods for the fetus and mother as well as about healthy eating behavior..

The study has practical implications after implementation of the national nutrition Program and maternal essential nutrition actions since 2008. Such a low level of mothers having adequate dietary diversity implies the need for fortifying public health and behavior change communication efforts at the grassroots level to curb the problem.

4.6: Strength and limitation of the study

Strength

- Data were not collected during holidays/celebrations in which it is likely that food consumption does not reflect a typical diet.
- Data collection done in non-consecutive days to avoid day of the week effect.

Limitation

- Because of cross-sectional nature of the study, the reported dietary diversity prevalence may vary over seasons, which was not captured by this study
- The finding was not representative of the usual intake of individuals, since 24-hr recall does not reflect the usual intake of individuals, but shows at a group level.
- There could be a probability of social desirability bias while answering the questions, which was tried to be minimized by telling the study participants that their personally identifiable information will not be recorded and they have to tell the truth.

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The study showed that the overall consumption of adequate dietary diversity of the pregnant mothers was found to be low. Maternal educational level, husband's educational level, mother's occupation, gravidity and number of ANC services were significantly associated factors affecting dietary diversity.

5.2. Recommendation

5.2.1: Forthe Government

- The government should for peoples who cannot read and write attend formal education, since educated peoples have good information and awareness about food diversity as well as better understand to nutritional messages.

5.2.2: For Health workers

- Provide regular advice and health education for women about the nutritional value of consuming different food groups' especially animal sources of foods, fruits and vegetables, since they are minimally consumed.
- Give advice to increase number of ANC visits and counsel regarding food diversity benefit and how to diversifying their diet.
- Advice to use family planning for reproductive age mothers to decrease family size

5.2.3: For future researcher

- The researcher can use this study as baseline and include quantitative dietary diversity measurements like weighted-food record and observedweighed records-method
- Strong study design (longitudinal) is advisable to see the seasonal variation of adequate dietary diversity.

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ANNEXES

Annex 1: Questionnaire: English version

Questionnaire designed to collect data for the research Titled as "Dietary diversity and associated factors among pregnant women attending ANC in Injibara General Hospital, North West, Ethiopia

SECTION 1: INTRODUCTION

Dear respondent,

You are one of the respondents selected to participate on the study entitled as "Dietary diversity and associated factors among pregnant women attending ANC in Injibara General Hospital, North West Ethiopia. The study is conducted by Yeromnesh Tessema Post Graduate student of Applied Nutrition at Bahir Dar University and the major aim of this study is to write a thesis for partial fulfillments of Masters of Science in Applied Nutrition.

There is no potential risk that may cause any harm to you except very short time taken.No financial benefits are related with this study. But the finding from his research may reveal important information for the local health planners.

Your participation is entirely voluntary and the questionnaire is completely anonymous. Finally, I confirm you that the information you share us will be kept confidential and only used for the academic purpose. No individual's responses will be identified as such and the identity of persons responding will not be published or released to anyone. All information will be used for academic purposes only.

Thank you in advance for your kind cooperation and dedicating your precious time.

Table 1: Socio-demographic characteristics

S.No	Questions	Response	Remark
101	Age	----------years	
102	Marital status	1. Married 2. Single 3. Divorced 4. Widowed	
103	Ethnicity	1. Agew	

		2. Amhara 3. Other specify----	
104	Religion	1. Orthodox 2. Protestant 3. Muslim 4. Catholic 5. Other (specify)	
105	Place of residence	1. Rural 2. Urban	
106	Family size	-------(in number)	
107	Occupation?	1.House wife 2.farmer 3.Govermment employee 4. Merchant or any business 5.Other specify-	
108	Husband's occupation?	1.Farmer 2.Merchant or any business 3.Govermment employee 4.Dalily laborer 5.Other specify-	
109	Educational level of pregnant women	1.Can't read and write 2 Can read and write 3.Primery education 4.Secondary education 5 .College and above	
110	Husband's Educational level?	1.No formal education 2.Primery education 3.Secondary education 4.College and above	

Economic factors

Table 2: Household Food Insecurity Access Scale (HFIAS) Measurement Tool

Questions

S.No	Questions	Response	Remark
201	In the past four weeks, did you worry that your household would not have enough food?	1 yes 2.no (if no go to)	
	If yes for Q201, how often did this happen?	1. Rarely (1 or 2 times) 2. Sometimes (3 to 10 times) 3. Often (> 10 times)	
202	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	1. Yes 2. No	
	If yes for Q202, how often did this happen?	1. Rarely (1 or 2 times) 2. Sometimes (3 to 10 times) 3. Often (> 10 times)	
203	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	1. Yes 2. No	
	If yes for Q203, how often did this happen?	1. Rarely (1 or 2 times) 2. Sometimes (3 to 10 times) 3. Often (> 10 times)	
204	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat	1. Yes 2. No	

	because of a lack of resources to obtain other types of food?		
	If yes for Q204, how often did this happen?	1. Rarely (1 or 2 times) 2. Sometimes (3 to 10 times) 3. Often (> 10 times)	
205	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	1.Yes 2.No	
	If yes for Q205, how often did this happen?	1. Rarely (1 or 2 times) 2. Sometimes (3 to 10 times) 3. Often (> 10 times	
206	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	1. Yes 2. No	
	If yes for Q206, how often did this happen?	1. Rarely (1 or 2 times) 2. Sometimes (3 to 10 times) 3. Often (> 10 times)	
207	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	1.Yes 2.No	
	If yes for Q207, how often did this happen?	1. Rarely (1 or 2 times) 2. Sometimes (3 to 10 times) 3. Often (> 10 times	
208	In the past four weeks, did you or any household member go to sleep at night	1.Yes	

	hungry because there was not enough food?	2.No-		
	If yes for Q208, how often did this happen?	1. Rarely (1 or 2 times) 2. Sometimes (3 to 10times) 3. Often (> 10 times		
209	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food	1.Yes 2.No		
	If yes for Q 209, how often did this happen?	1. Rarely (1 or 2 times) 2. Sometimes (3 to 10 times) 3. Often (> 10 times		
Table 3: Economic factors **Household asset**				
	Asset type	Response	How many	Remark
	Domestic animals	1 .yes---------- 2.No	----------	
301	Ox	1.Yes------- 2No	---------	
302	Cow	1 .yes---------- 2.No	---------	
303	Calf	1 .yes---------- 2.No	---------	
304	Sheep	1 .yes---------- 2.No	-------	

305	Goat	1 .yes---------- 2.No	--------	
306	Horse	1 .yes---------- 2.No	--------	
307	Donkey	1 .yes---------- 2.No	-------	
308	Mules	1 .yes---------- 2.No		
309	Chickens	1 .yes---------- 2.No	--------	
	Durable assets			
310	Television	1 .yes 2.No		
311	Radio	1 .yes 2.No		
312	Electricity	1 .yes 2.No		
312	Refrigerator	1 .yes 2.No		
313	Conventional telephone	1 .yes 2.No		
314	Mobile phone	1 .yes 2.No		
315	Car	1 .yes 2.No		

316	Motorcycle	1 .yes 2.No		
317	Cycle	1 .yes 2.No		
318	Cart	1 .yes 2.No		
319	money	1 .yes--------- 2.No	--------	
320	Ownership of owned living house	1 .yes 2.No		
321	Ownership of agricultural land	1 .yes---------- 2.No	-------	
	Productive assets			
322	Modern beehive	1 .yes---------- 2.No	-----	
323	Traditional beehive	1 .yes---------- 2.No	-----	
324	Eucalyptus tree(bahir zaf)	1 .yes---------- 2.No	------	
325	Cypress tree(tid)	1 .yes---------- 2.No	------	
326	Wicker (kerkeha)	1 .yes---------- 2.No	------	
327	Agriculture products		Number in kuntal	
328	Teff	1.Yes 2.no	------	
329	Barely	1.yes 2.No	------	
330	Potato	1.yes 2.No	------	

331	Corn(bekolo)	1.yes 2.No	------	
332	Wheat	1.yes 2.No	------	
	Other	1.yes 2.No	------	
	Housing (characters)			
333	Indoor plumping/ pipe water	1 Yes 2.No		
335	Type of flooring	No -Earth/dung Yes -Cement/raw wood		
336	Toilet facility	No. Unsanitary or traditional pit latrine/ no toilet Yes. Sanitary or improved pit latrine		
	Other household materials			
337	Sofa	1Yes 2.No		
338	Bed	1.Yes 2.No		
339	Table	1.Yes 2.No		
340	Chair	1.Yes 2.No		
341	Stove	1.yes 2.No		

Table.4:Obstetrics factor

S.No	Question	Response	Remark
401	How many ANC visits do you have in your current pregnancy?	1. first visit 2. second visit 3. third visit 4. fourth and above	
402	How many numbers of living child (children) do you have now	----------in numbers	
403	How many pregnancies did you have?	----------in numbers	
404	Gestation in weeks	1. First Tri Trimester 2. Second Tri Trimester 3. Third trimester	
405	Have you experienced any illness in current pregnancy within two weeks?	1. Yes 2. No	
406	Which sign/symptom did you have?	Yes No	
407	IF Q306 Is yes is there any food avoided due to illness?	1.yes---------- 2.No	yes—list

Table.5: Cultural factor (food taboo)			
S.No	**Question**	**Response**	
501	Is there any food or drink avoided	1.yes	

	during pregnancy due to cultural restriction?	2.no--	
502	If yes for Q 5.1 which foods?	Specify----------	
503	Do you have any idea the reason for restriction of some foods	1.Fearing big baby 2. Fearing of abortion 3.Culturally unacceptable 4. I have no idea	

Pregnant women dietary diversity questionnaire

Please describe the foods (meals and snacks) that you ate yesterday (in the last 24hours) during the day and night, whether at home or outside the home. Start with the first food eaten or drink in the morning.

Write down all food and drinks mentioned by the respondent. When composite dishes are mentioned, ask for the list of ingredients. When the respondent has finished, probe for meals and snacks not mentioned.

frequency of meal in the last24hr	Food items	Detail description of the items	Detailed description of the serving /portion size	Detailed description of preparation
Breakfast				
Snack				
Lunch				
Snack				
Dinner				
Snack				
Beverages				
Other				

When the respondent recall is complete, ask the respondent if a food item from this group was consumed. The above questionnaire is adapted from FAO 2016 guidelines, EDHS 2011 and USAID HFIAS Version3, 2007 and Abu et al, Food and Nutrition Bulletin 2016, Vol.37(1)

Annex 2: Questionnaire: Amharic version

ባህርዳርዩኒቨርሲቲ

ኬሚካልእናምግብምህንድስናት/ ቤት

አፕላይድስነ-ምግብዲፓርትመንት

የጥናቱተሳታፊዎችመረጃመስጫናፈቃደኝነትመጠየቂያቅፅ

ጤናይስጥልኝ! ስሜ_____ይባላል፡፡በአሁንሰዓትበባህርዳር ዩኒቨርሲቲአፕላይድስነምግብዲፓርትመንትየሁለተኛድግሪዎንተማሪየሆነችዉወይዘሮየሮምነሽተሰማየመ መረቂያጹሁፍለማዘጋጀትነዉ፡፡በዚህምጥናትእርስዎተሳታፊእንዲሆኑስለተመረጡስለጥናቱገለጻእንድናደር ግልዎትንሽጊዜዎትንእንዲሰጡኝበትህትናእጠይቃለሁ፡፡ጥናቱበእንጅባራሆስፒታል በነፍሰ-ጡርእናቶችላይየአመጋገብስብጥርናተያያዥምክንያቶችንየሚዳስስጥናትነዉ፡፡የዚህጥናትአላማየድህረምር ቃትሂደቱንለማማላት

ቢሆንምነገርግንየጥናቱጥቅምከዚህምበላይእንደሆነይታመናል፡፡

መረጃሰብሳቢው ለነፍሰ-ጡር እናቶችበቅድመወሊድጊዜጥያቄዎቹንበማንበብእርሰዎደግሞለጥያቄዎቹምላሽበመስጠት እስከ 20 ደቂቃዎችአብረንእንቆያለን፡፡ይህጥናትየርሰዎንየተወሰነሰዓትከመሻማትበቀርየሚያመጣዉብዙየሚባልጉዳ ትየለም፡፡በጥናቱስለተሳተፉየሚያገኙትቀጥተኛየሆነጥቅምየለም፡፡ነገርግንየጥናቱዉጤትበአካባቢዉበጤና ዙሪያለሚሰሩድርጅቶችጠቀሚየሆኑመረጀዎችንይሰጣል፡፡የሚሰጡትመረጃምስጢራዊነቱየተጠበቀነዉ፡፡በ መጠይቁምዉስጥየርሰዎንማንነትበተለየሁኔታየሚጠይቅጥያቄየለም፡፡የጥናቱምዉጤትጥናቱለተካሄደበት አካባቢጠቅለልያለመረጃየሚሰጥሲሆንበጥናቱመሳተፍሙሉበሙሉበፈቃደኝነትላይየተመሰረተነዉ፡፡በጥናቱ የመሳተፍምሆነያለመሳተፈመብትአለዎት፡፡ለመሳተፍፈቃደኛካልሆኑደግሞበማንኛዉምሰዓትየማቆምወይ ንምመመለስያልፍለጉትንጥያቄያለመመለስመብትአለዎት፡፡የበለጠመረጃማግኘትካሰፈለገዎ፡ጥናቱንየተመ ለከተማንኛዉምዓይነትጥያቄወይንምአሰተያየትካለዎትበሚከተሉትአድራሻዎችመረጃማግኘትይችላሉ፡፡

የሮምነሽተሰማ

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ስለተሳትፎዎበጣምእናመሰግናለን፡፡

ክፍልአንድ:ማህበራዊእና ሥነ-ህዝባዊጉዳዮችንየሚመለከቱጥያቄዎች			
ተ.ቁ	ጥያቄ	መልስ	ምርመራ
1O1	እድሜዎትስንትነዉ	----------	
102	የትነዉየሚኖሩት	ሀ.ከተማለ.ገጠር	
103	ብሄር	ሀ.አማራለ.አገዉሐ.ሌላ....	
104	ሀይማኖት	ሀ.ኦርቶዶክተዋህዶለ.ሙሰሊምሐ.ፕሮቴስታንትመ.ሌላ	
105	የትዳርሁኔታ	ሀ.ያገባችለ.ያላገባችሐ.የፈታችመ. ባልየሞተባት	
106	የእርስዎየስራሁኔታ	ሀ.የቤትእመቤትለ.አርሶአደርሐየመንግስትሰራተኛሐ.ነጋዴሠ .ሌላካለ	
107	የባልቤትዎየስራሁኔታ	ሀ.አርሶአደርለ. የመንግስትሰራተኛሐ. ነጋዴመ. የቀንሰራተኛሠ .ሌላካለ	
108	የእርስዎየትምህርትደረጃ	ሀ.ማበብእናመጻፍየማይችልለ.ማበብእናመጻፍየሚችልሐ. የመጀመሪያደረጃመ.ሁለተኛሠ.ኮሌጅእናከዚያበላይ	
109	የባልቤትዎየትምህርትደረጃ	ሀ.ማበብእናመጻፍየማይችልለ.ማበብእናመጻፍየሚችልሐ. የመጀመሪያደረጃመ.ሁለተኛሠ.ኮሌጅእናከዚያበላይ	
110	የቤተሰብብዛትበቁጥር	----------	
ክፍል-ሁለት:ኢኮኖሚንጉዳዮችንየሚመለከቱጥያቄዎች			
የቤተሰብየምግብዋስትናሁኔታለማወቅየተዘጋጀመጠይቅ			
201	ባለፉት 4 ሳምንታትበቤተሰብዎውስጥበቂምግብአይኖርምብለውሰግተውነበር?	1. አዎ 2. የለም	
	ለቁጥር 201 መልስዎአዎከሆነ ስንትጊዜሰግተዋል?	1. 1/ 2 ጊዜ 2. ከ 3-10 ጊዜ 3. ከ10 ጊዜበላይ	

202	ባለፉት 4 ሳምንታትእርስዎወይምሌላየቤተሰብአባልበሀብትእጦትም ክንያትየምትፈልጉትንየምግብአይነትሳትበሉየቀራችሁበት ሁኔታነበር?	1. አዎ 2. የለም	
	የጥያቄቁጥር 202 መልስዎአዎከሆነስንትጊዜ?	1. 1/ 2 ጊዜ 2. ከ 3-10 ጊዜ 3. ከ10 ጊዜበላይ	
203	ባለፉት 4 ሳምንታትእርስዎወይምሌላየቤተሰብአባልበሀብትእጦትም ክንያትየተወሰኑትንየምግብአይነቶችንብቻየምትበሉበትሁ ኔታነበር?	1. አዎ 2. አልነበረም	
	የጥያቄቁጥር 203 መልሶአዎከሆነ ስንትጊዜ?	1. 1/ 2 ጊዜ 2. ከ 3-10 ጊዜ 3. ከ10 ጊዜበላይ	
204	ባለፉት 4 ሳምንታት፣እርሶወይምሌላየቤተሰብአባልበሀብትእጦትም ክንያትሌላምግብአይነቶችንማግኘትባለመቻላችሁየማትፈ ልጉዋቸውንምግቦችንየምትበሉበትሁኔታነበር?	1. አዎ 2. አልነበረም	
	የጥያቄቁጥር 204 መልሶአዎከሆነ ስንትጊዜ?	1. 1/ 2 ጊዜ 2. ከ 3-10 ጊዜ 3. ከ10 ጊዜበላይ	
205	ባለፉት4 ሳምንታት፣እርሶዎ ወይምሌላየቤተሰብአባልበቂምግብስላልነበረከወትሮውያነሰ ምግብየምትበሉበትሁኔታነበር?	1. አዎ 2. አልነበረም	
	የጥያቄቁጥር 205 መልሶአዎከሆነ ስንትጊዜ?	1. 1/ 2 ጊዜ 2. ከ 3-10 ጊዜ 3. ከ10 ጊዜበላይ	
206	ባለፉት 4 ሳምንታት	1. አዎ	

	እርሶዎወይምሌላየቤተሰብአባልበቂምግብስላልነበረቁርስ፣ምሳ፣መክሰስወይምእራትየማትበሉበትሁኔታነበር?		2. አልነበረም	
	የጥያቄቁጥር 206 መልሶአዎከሆነ ስንትጊዜ?		1. 1/ 2 ጊዜ 2. ከ 3-10 ጊዜ 3. ከ10 ጊዜበላይ	
207	ባለፉት 4 ሳምንታት፣በቤተሰቦውስጥበሀብትእጦትምክንያትምንምየሚበላምግብያልነበረበትሁኔታነበር?		1. አዎ 2. አልነበረም	
	የጥያቄቁጥር 207 መልሶአዎከሆነ ስንትጊዜ?		1. 1/ 2 ጊዜ 2. ከ 3-10 ጊዜ 3. ከ10 ጊዜበላይ	
208	ባለፉት 4 ሳምንታት እርሶወይምሌላየቤተሰብአባልበቂምግብስላልነበረምንምሳ ትበሉእንደራባችሁየተኛችሁበትሁኔታነበር?		1. አዎ 2. አልነበረም	
	የጥያቄቁጥር 208 መልሶአዎከሆነ፣ስንትጊዜ?		1. 1/ 2 ጊዜ 2. ከ 3-10 ጊዜ 3. ከ10 ጊዜበላይ	
209	ባለፉት 4 ሳምንታት፣እርሶወይምሌላየቤተሰብአባልበቂምግብስላልነበረቀንናሌሊትሙሉያልበላችሁበትሁኔታነበር?		1. አዎ 2. አልነበረም	
	የጥያቄቁጥር 209 መልሶአዎከሆነ፣ስንትጊዜ?		1. 1/ 2 ጊዜ 2. ከ 3-10 ጊዜ 3. ከ10 ጊዜበላይ	
	ክፍልሶስት፡የቤተሰቡንበረት			
	የንብረቱዓይነት	መልስ	ብዛት	ምርመራ
210	የቤትእንስሳትአለዎት	1. አዎ 2. የለም		መለሰዎአዎከሆነወደ

				ቀጣይ
211	በሬ	1. አዎ 2. የለም	----------	መለሰዎአዎከሆነበቁጥርይገለፅ
212	ላም	1. አዎ 2. የለም	----------	
213	ጥጃ	1.አዎ 2.የለም	----------	
214	በግ	1.አዎ 2.የለም	----------	
215	ፍየል	1.አዎ 2.የለም	----------	
216	ፈረስ	1.አዎ 2.የለም	----------	
217	አህያ	1.አዎ 2.የለም	----------	
218	በቅሎ	1.አዎ 2.የለም	----------	
219	ዶሮ	1.አዎ 2.የለም	----------	
	ዘላቂንብርት			
220	ቴሌቭዥን	1.አዎ 2.የለም	----------	
221	ሬዲዮ	1.አዎ 2.የለም	----------	
223	ኤልክትሪክ	1.አዎ 2.የለም	----------	

224	ፊሪጅ	1.አዎ 2.የለም	----------	
225	መደበኛስልክ	1.አዎ 2.የለም	----------	
226	ሞባይል	1.አዎ 2.የለም	----------	
227	መኪና	1.አዎ 2.የለም	----------	
228	ሞተርሳይክል	1.አዎ 2.የለም	----------	
229	ብስክልት	1.አዎ 2.የለም	----------	
230	ባጃጅ	1.አዎ 2.የለም	----------	
231	ጋሪ	1.አዎ 2.የለም	----------	
232	ባንክ/ማይክሮፋይናንስአካዉንት	1.አዎ 2.የለም	----------	
233	የሚያርሱትመሬትአለዎት	1.አዎ 2.የለም	---------- (በራሳቸዉመለኪያ)	
234	የራስዎመኖርያቤትአለዎት	1.አዎ 2.የለም	----------	
	ገቢአስገኝምርቶች			
235	ዘመናዊየንብቀፎ	1.አዎ 2.የለም	----------	
236	ባህላዊየንብቀፎ	1.አዎ 2.የለም	----------	

237	ባህርዛፍ	1.አዎ 2.የለም		
238	ጥድ	1.አዎ 2.የለም		
239	ቀርቀሃ	1.አዎ 2.የለም	----------	
	አመታዊየግብርናዉጤትበኩንታል			
240	ጤፍ	1.አዎ 2.የለም	----------(በኩንታል)	
241	ገብስ	1.አዎ 2.የለም	----------(በኩንታል)	
242	ድንች	1.አዎ 2.የለም	----------(በኩንታል)	
243	በቆሎ	1.አዎ 2.የለም	----------(በኩንታል)	
244	ስንዴ	1.አዎ 2.የለም	----------(በኩንታል)	
245	ሌላካለ	1.አዎ 2.የለም	----------(በኩንታል)	
	ሌሎችየቤትዕቃዎች			
246	ሶፋ	1.አዎ 2.የለም		
247	አልጋ	1.አዎ 2.የለም	----------	
248	ጠረጴዛ	1.አዎ 2.የለም	----------	

249	ወንበር	1.አዎ 2.የለም	----------	
	የቤትዎሁኔታ			
250	ጣሪያዉበዋናነትየተሰራ በትከምንድንነዉ	1.ቆርቆሮ 2.ሳር 3.ፕላስቲክ 4.ብረት 5. ሌላካል		
251	ወለሉበዋናነትየተሰራበ ትከምንድንነዉ	1.ሴራሚክ 2.ሲሚነቶ 3.አፈር		
252	የመጠጥዉሃአቅርቦትም ንድንነዉ	1.የባንባዉሃ 2. የጉድጋድዉሃ 3.የዝናብዉሃ 4.የወንዝዉሃ 5. ሌላካለ		
253	በቤትዎዉስጥየትኛዉ መጸዳጃቤትአለዎት	1.በዉሃየሚስራ 2.የጉድጋድደርቅመጸዳጃ 3.መጸዳጃቤትየለም 4.ሌላካለ		
ክፍልአራት፡የወሊድታሪክየሚመለከቱጥያቄዎች				
301	በአሁኑእርግዝናሽይሄቅድመወሊድክት ትልለስንትተኛጊዜነው?		1. አንድጊዜ 2. ሁለትጊዜ 3. ሦስትጊዜ 4. አራትጊዜአናከዛበላይ	
302	ስንትልጆችአለዎት		----------	
303	ስንተኛእርግዝናዎነዉ		----------	
304	እርግዝናዎስንትወርዎነዉ		----------	
305	በአሁኑእርግዝናዎበዚህሁለትሳምንትታ መዉያዉቃሉ?		1.አዎ 2.የለም	
306	ጥያቄ 305 መልስዎአዎከሆነበህመሙምክንያትምግ ብየማይመገቡበትጊዜአለ?		1.አዎ 2.የለም	
307	ለጥያቄ 306 መልዎአዎከሆነምንዓይነትብሽታነው?		1. ጨጉራ 2.የስኳርበሽታ 3.የደምግፊት	

		4.የልብበሽታ 5. ሌላካለይገለጸ----------	
ክፍል5፡የባህልተዕጽኖየሚመለከቱጥያቄዎች			
401	በእርግዝናወቅትየሚከለከል ምግብአለ	1.አዎ 2.የለም	
402	ጥያቄ 501 መልስዎአዎከሆነምየትኛዉየምግብዓይነት	----------	
03	እነዚህምግቦችንያለመመገበዎምክናየትአለዎት	1.ህፃኑእንዳይፋፋፈርተዉነዉ 2.ዉርጃያመጣልብለዉ ስለፈሩ 3.በባህልተቀባይነትሰለሌለዉ 4.አላዉቀዉም	

ክፍልአምስት፡የነፍሰጡርእናቶችየምግብስብጥርን (ልዩልዩምግቦችንመመገብ) በተመለከተ የተዘጋጀመጠይቅ

እባክዎትትናንትቀንናሌሊትበቤትወይምከቤትውጭየበሉትንምግብወይምመክሰስይገለጽ፡፡

ትናንትጠዋትከበሉትምግብናከጠጡትመጠጥጀምረዉይገሩን፡፡ሙሉቀኑንየበላሺዉንእናየጠጣሽዉንቀስበቀስለማስታወስሞክሪ፡፡

(ሁሉንምየበሉትንእናየጠጡትንመመዝገብአለበት፤ቤተሰቡባንድማዕድከበላየነበሩትየምግብአይነቶችሁሉመመዝገብአለባቸው፡፡ተጠያቂዋማስታወሳቸውንሲጨርሱየረሱትምካለማሰታወስያስፈልጋል፡፡ተጠያቂዋማስታወሳቸውንከጨረሱየምግብስብስቦችንከዚህበታችባለውሰንጠረዥማስቀመጥያስፈልጋል፡፡ከተጠቀሱትየምግብስብስቦችእሳቸዉየበሉትንምግብካልጠቀሱናከረሱማስታወስያስፈልጋል፡፡)

በቀንዉስጥየመመገቢያጊዜዎች	የምግቡዓይነት	ምግቡየተሰራበትይዘት	የተመገቡት/የጠጡትመጠን
ቁርስ			
መክሰስ (የ4፡00 ሰዓት)			
ምሳ			

መክሰስ			
እራት			
መክሰስ			

Annex-3: Awgni Translation of the questionnaire

ባህርዳርዩኒቨርሲቲዳ

ኬሚካሉስታምግቡምንድስኒውክንቲ ቻንዳ

ኣፕላይድምግቡዲፓርትመንትስ ች ቺ ኃ ቼ ቻቻቻ ች

የጥናቱተሳታፊዎችመረጃመስጫናፈቃደኝነትመጠየቂያቅፅ

ቲኖይን! ስምኪ_____እስቴ፡፡እን ጊዝስ ባርዳር ኒቨርስቲዳ ኣፕላይድምግቡ ፅንቱ ዲፓርትሜንትዳ 2ንቲዲግሪ ክንታንታ ታኹት ዋይዛሩ ያሮምናሽ ታሳማስ ዳቺርዔ ውፎ ቱርስያኽ፡፡እንፅናትስ እንቱ ኣሴቱፍኝንቲ ታኻንታ ጎሌልስታንቲንኻ ኣኽስ፣ፅናቶ ማሉኽስ ጌሌፅቼ ዔፓያታ ልቓ ጊዞ ይታንታ ትትኒስ ካስቴ፡፡

እን ጥናቲ እንጃቢሪ ትክላሊ ሆስፒታልዳ ሼርካ ቹትካው ሚጌብስትቻኺው **እልቕትኺስታ እምትንኩ ምክንያትካዋ ዳሌስስያኽ፡፡እንፅናቱ ኣላሚ** ላኝንቲ ዲግሪውሳ ካሲስቶ ዋኽትቻፅቻስ ያኹኒውላ ፣ፅናት እንኺዴስ ድምክና እሊውሳ ትክሞክላ ኣግስዓውታ ኣምንስቴ፡፡

ንባሮኩፕዓንቲሼርካቹትካክምንትዴስፍናጊዛይክካሲካዋኣንቤብቻስ፣እንቱ ዴሜካ ካሲካስ ዙርሜ እይስ 20 ዳኪካኺስታ ኣብርቱ እጂኔ፡፡እን ፅናት እንቱው ባኑሳ ጊዞ ሻሚትዴስ ይነ ታምባው ዳማኪ ድክታ እላ፣እንቱክላ እንፅናትዴስ ኩታ ኣግዔኑ ትክም እላኪ፡፡እንያኹኒውላ ፅናቱ ዎይሚ ዙራሙሪው እምፕልታቹ ቲንዳ እንፃኽስታንኩ ቲንኩ ኾትካስ ፋይፃንኩ ንባርካዋ እይቻስ ኣጌሌጌልቻስ ካሌ፡፡

እንቱ ይታኑ ዙርሚስታ ንባሩ ስርኩኒ ማንዲስቱኺያኽ፡፡እንፅናትዳ ኣሴቱፍቻኼ ዔውቻ፣ዋኽስ ዋኾ እንቱው ፍካድዳ ቱርቱኹ ኣኽቻታጊ፣እንፅናትዳ ኣሴቱፍቻ ዔውቻኪ ያኻ ባይቻስ ካሊስቴ፡፡ኣሴቱፍቻኼክላ ፋቱኑ ጊዝ ክቻዳ ኬውፅቻስኪ ፋቱኑሳ ካሴ ጎሌልትካማ ዙርዕቻስ ካሌና ፣ ካሳ ዙርማኻዳእንቱውሳ ኣይቻቶ ማላው ካሲ ክላ እላቲውያኽ፡፡

እሳን ንኹሳ ንባሮ ኣግዕች ፋይፁንደስ፣እንፅናቶ ማሉኽስ ዎሺኬኪ ኣይኔቶ ካሴ ኣኹኪ ካንቲ ዝኩንደስ ሲፉንኩ ኣድራሸካደስ ንባሮ ኣግዕስ ካሌና፡፡

ያሮምናሽቱሴማ

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ቤን ላኹ ፡-ማቤራዊስታ እዝብኩ ጉዳይካዋ ማላንኩ ካሲካ			
ቱር	ካሲ	ዙርሚ	ምርማሪ

ቼፍ			
1	እድሚ ውኻይ?	----------	
2	ዋዳይ ዚኪኑ?	ቡ. ኬቱምዳሱ.ገጠር	
3	ብሄር	ቡ.ኣማኻሪ ሱ.ኣዊ ሹ.እሊዊ....	
4	ኣይማኑት	ቡ.ኦርቶዱክስ ተዋኽዱሱ. ስላሚሹ.ፕሮቴስታንት ኩ.እሊዊ	
5	ትዳሩ ኣኺኒ	ቡ.ሚዒትሱ.ሚዔይስትሹ. ኽይቱትኩ. ኺያራ ክሩት	
6	እንፅኺው ኣኺኒ	ቡ.ዳሞዚ ጋትሱ. ኣሬሳንታ ሹ.ምንግስትት እንፃኽስታንታኩ.ጌዔናኹ .እሊዊ	
7	ካራሱ እንፅኺው ኣኺኒ	ቡ.ኣሬሳንቲሱ. ምንግስቱ እንፃኽስታንቲሹ. ጊዒኒ ኩ. ጌርኩ እንፃኽስታንቲ ኹ .እሊውዝኩንዴስ	
8	እንቱው ክንቲው ኣች	ቡ. ኣንቤብኾስ ታ ፃ ፊ ኾኻላቲኻሱ.ኣንቤብኾስ ታ ፃ ፊ ኾኻሌሺ.. እምፕላንቲ ኣች ኩ.ላኟንቲ ኣች ኹ. ኮሌጅስታ እንደስጃላ	
9	ካራሱ ክንቲው ኣች	ቡ. ኣንቤብኾስ ታ ፃ ፊ ኾኻላቲዊሱ.ኣንቤብኾስ ታ ፃ ፊ ኾኻላዊሺ.. እምፕላንቲ ኣች ኩ.ላኟንቲ ኣች ኹ. ኮሌጅስታ እንደስጃላ	
10	ኞናቹ ሚንችት	----------	

	ኞናቹ ንብሬት			
	ንብሬቱ ኣይኔት	ዙርሚ	ሚንቺት	ምርማሪ
I	ኞንኩ ንሴስካዋ ፃትካማ?	1. ይጋ 2. እላኪ		ዙርሚ ይጋ ያኹንደስ ሲፋውሾ...
1	ቢሪ	1. ይጋ 2. እላኪ	----------	ዙርሚ ይጋ ያኹንደስ ቼፍስ ጌለፅስቱስ
2	እሉዋ	1. ይጋ	----------	

		2. እላከ		
3	ኤው	1. ይ,ጋ 2. እላከ	----------	
4	ታይ	1. ይ,ጋ 2. እላከ	----------	
5	ፍ.ያለ	1. ይ,ጋ 2. እላከ	----------	
6	ፊሪሲ	1. ይ,ጋ 2. እላከ	----------	
7	ድ'ቮሪ	1. ይ,ጋ 2. እላከ	----------	
8	ብ'ቾለ	1. ይ,ጋ 2. እላከ	----------	
9	ዱሪ	1. ይ,ጋ 2. እላከ	----------	
II	**ቻኑ ንብሬት**			
1	ቱሌብ'ቨርኒ	1. ይ,ጋ 2. እላከ	----------	
2	ራዲዮኒ	1. ይ,ጋ 2. እላከ	----------	
3	ሜብራት	1. ይ,ጋ 2. እላከ	----------	
4	ፊሪጅ	1. ይ,ጋ 2. እላከ	----------	
5	ቻኑስልኪ	1. ይ,ጋ 2. እላከ	----------	
6	ሞባይለ	1. ይ,ጋ 2. እላከ	----------	

7	ማኪና	1. ይጋ 2. እላኪ	----------	
8	ሞተርሳይክሊ	1. ይጋ 2. እላኪ	----------	
9	ብስክልቲ	1. ይጋ 2. እላኪ	----------	
10	ባጃጅ	1. ይጋ 2. እላኪ	----------	
11	ጋሪ	1. ይጋ 2. እላኪ	----------	
12	ባንኩ/ማይክሮው አካዉንቲ(ያብቱሪ)	1. ይጋ 2. እላኪ	----------	
13	ኣሬሳኑ ብቲ ዝኩዋማ?	1. ይጋ 2. እላኪ	------(እንቶጂሱ ሊኪዒስ ጌሌዓን)	
14	ማኖሪ ቻን ዝኩዋማ	1. ይጋ 2. እላኪ	----------	
III	**ሚቄ ዬሜካንኩ ምርትካ፡-**			
1	ዝሜኑ ፅኻራው ኣንኪሚ	1. ይጋ 2. እላኪ	----------	
2	ባይሉ ፅኻራው ኣንኪሚ	1. ይጋ 2. እላኪ	----------	
3	ባርዛፍ	1. ይጋ 2. እላኪ		
4	ፅዲ	1. ይጋ 2. እላኪ		
5	ኣኒኒ	1. ይጋ 2. እላኪ	----------	

IV	**ኣሜትስ እርሺዶስ ኣግስታው ምርት ኩንታልስ፡-**			
1	ታሬ	1. ይ,ጋ 2. እላኪ	---------- (ኩንታልስ)	
2	ስምኪ	1. ይ,ጋ 2. እላኪ	---------- (ኩንታልስ)	
3	ዱኒዚ	1. ይ,ጋ 2. እላኪ	---------- (ኩንታልስ)	
4	ሹምቢ	1. ይ,ጋ 2. እላኪ	---------- (ኩንታልስ)	
5	ስንዳይ	1. ይ,ጋ 2. እላኪ	---------- (ኩንታልስ)	
6	እሊው ዝኩንዶስ	1. ይ,ጋ 2. እላኪ	---------- (ኩንታልስ)	
V	**እሊኩ ኞንኩ ኣክኽካ፡-**			
1	ሶፋ	1. ይ,ጋ 2. እላኪ		
2	ኻግ	1. ይ,ጋ 2. እላኪ	----------	
3	ቴሬፒዚ	1. ይ,ጋ 2. እላኪ	----------	
4	ሥምቤር	1. ይ,ጋ 2. እላኪ	----------	
VI	**ኞኑ ኣኺኒ ፡-**			
1	ኞኑ ኣምፕ(ኣንኬር)	1.ኮርኮሩዶስ 2.ሲቹዊዶስ 3.ላስቲክዶስ		

	ግቢትስትኹዊ እንዳማያስይ?	4.ቤርያስ 5. እሊው ኣክኺያሽ	
2	ኻኑ ሥሌል ግቢትስትኹዊ እንዳማያስይ?	1.ሴራሚኪ 2.ልሹ 3.ኽብዒ	
3	ኣኹው ዲግስኺ ዋትኻይ?	1.ቦምቢው ኣኹ 2. ፍሩ ኣኹ 3.እሪው ኣኹ 4.ብኑ ኣኹ 5. እሊው ዝኩንዴስ	
4	ኻንዳ ዝኩኹ ዋንኩትኺ ዋታ ኩዋዊይ?	1. ኣኹስ እንዋኽስታዊ 2.ካጊ ፍሩ ዋንኩትኺው ኻን 3. ዋንኩትኺው ኻን እላ 4. እሊው ዝኩንዴስ	

ቤን ሹኻ፡-ካሜንኹሳ ታሪኮ ማሉንኩ ካሲካ፡-

1	ኻሺሱ ሼርትኺዳ እን ኣኪምኻናሱ ሲፍኻኺ ውኻንቲ ጊዝይ?	1. ጂሚሪ ጊዝስ 2. ላኻንቲ ጊዝስ 3. ሹኻንቲ ጊዝስ 4. ሴዛንቲስታ ኣንዴስ ጃላ	
2	ውኻ ጀርኪ ዝኩን?	----------	
3	ሼርታኒስ ውኻንቲ ጊዛያስይ?	----------	
4	ሼርቱንዴስ ውኻ ኣርፊይ?	----------	
5	ኻሺሱ ሼርትዳ ላኻሶኼትዴስ ናቴ ቑንዳስቲካ ታቑካማ?	1.ይጋ 2.እላ	
6	ካሲ 305ንቲውዙርሚ ይጋ ያኹንዴስ፣ቑንዚው ምክንያቲስ ምግቦ ኹዋቲኑ ጊዝ ዝኩዋማ?	1.ይጋ 2.እላ	
7	ካሲ 306ንቲውዙርሚ ይጋ ያኹንዴስ፣ዋታኮው ቑንዚው ኣይነትይ?	1. ችጎሪ 2. ሽኩዋሩ ቑንዚ 3.ብሪው ሺንክትኺ 4. ሼው ቑንዚ	

		5. እሊው ቹንዚ ያኹንዴስ እንዳ ጌሌፅስትስ----------	
ቤን ሴዛ፡-ባይሉሳ ቻኒስቶ ማሉንኩ ካሳ ዙርምካ			
1	ሼርት ጊዛያስ ጌጌውስታንኩ ምግብካ ዝኩናማ?	1.ይጋ 2.እሳ	
2	ካሲ 501ንቱው ዙርሚ ይጋ ያኹንዴስ ሥሺኒ ምግቡ ኣይኔትይ?	----------	
3	ባይልታ ጌጌውስቱንኩ ምግብካዋ ባይኝ ምክንያት ዳርማይ?	1.ስር ቡዚታቲታ ንሻስ 2. ስሮ ጌምዔ ናታ ጅፊስትሻሲ 3. ባይልስ ዴጌፍስታቲው ኣኽሻሲ 4. ኣቾያኪ	
ቤን ኣንኩዋ፡-ሼርካ ቹትካው ምግቡ ሜቴቴንዔ (ሊሊትኾንኩ ምግብካዋ ሜቴቴንሻፅኼ) ማሉኽስ ዲጉንኩ ካሲካ **ኣይቻ ጌርካስታ ኻራ ቾንዳ ኣኹኪ ኣፍዴስ ኹኑሳ ምግቦ ኣዴር ጌሌፃን! ኣይቻ ስግላ ኹኑ ምግብዴስስታ ዝቹኑ ዝቺዴስ ጀሜርትካማ ድቹዋን፡፡እንሳ ዔውቾስኩዒ ጌርኮ ዋኾ ዝቹንስስታ ኹዬኒስ እስቲኑሳጊ ታክስቾስ ሞኬራን፡፡(ኹኑሳስታ ዝቹኑሳጊ ውላዋ ሜዜጌብቾ ፋይዔ፡፡ቾና እምፕል ማድዳ ኹስቱንዴስ፣ ማድዳ እሺንኩ ምግብኩ ኣይኔትካዋጊ ክቸክቺስ ሜዜጌብቾ፡፡ካሲስታንታ ታክስዔ እሚካማ ዜኔግስቱኺ ምግቡ ኣይኔት ኣግስቱስ እንግራ ሜዜጌብቾ እይስቱ፡፡እንዴስ ድምክና ካሲስታንታ ታክስ ዊዱንዴስ ፋሌን,ጋ፣ምግብኩዝርዝርካዋ እንዴስ ኩክራ ዝኩኽ ቴርስ ዛራዛርቾ ፋይዔ፡፡ዛራዛርስቱንኩ ምግብኩ ኣይኔትካዴስ እንቱ ኹይኑሳ ዜኔጋቲንታ ታክስዒዴስጊ ካንትቾስ ጌሌፅቾ እይስቱ፡፡)**			
ጌርክቺፋ ሜጌብስትች ጊዝ	ምግቡኣይነት	ምግብ ግቢትስትኹዊ እሚ	ሜጌብስቱኽ/ዝቹኹዊ ሚንቺት
ኩርስ			
ሜክሴስ (4፡00 ሳትስ)			
ምላኽ			
ሜክሴስ			

እርባት			
ሜክሌስ			