



*DIETARY DIVERSITY AND ASSOCIATED FACTORS AMONG LACTATING MOTHERS
IN ANGACHA DISTRICT SOUTH ETHIOPIA, 2022*

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RESEARCH THESIS SUBMITTED TO JIMMA UNIVERSITY INSTITUTE OF HEALTH
FACULTY OF PUBLIC HEALTH DEPARTMENT OF NUTRITION AND DIETETICS
AS PARTIAL FULFILLMENT OF THE REQUERMEN FOR MASTER OF SCINCE IN
HUMAN NUTRITION.

JULY, 2022

JIMMA ETHIOPIA.

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ABSTRACT

Back ground: Dietary diversity is the number of foods consumed across and within food groups over a reference period .It reflects the concept that increasing the variety of foods and food groups in the diet helps to ensure adequate intake of essential nutrients and promotes good health .and wellbeing of lactating mothers However, they are major vulnerable group to nutrition deficiency and related health problems due to a number of factors and little is documented. The objective of this study is to assess dietary diversity and associated factors among lactating mothers age (15-49) years in the study area.

Methods: A community based cross-sectional study was conducted among 632 lactating women from May to July 2022 in Angacha district. The study participants were chosen using a multistage sampling and simple random sampling technique to select study participants and data were collected using interviewer administered questionnaire. After coding, cleaning it had entered into EPI-data entry 3.6 version and exported to SPSS Software version 26 for analysis. Based on COR, AOR, P-value 0.05, and 95% CI and descriptive analysis was conducted for checking response rate of respondents. Variables with a p value of less than 0.25 were entered into multiple logistic regression model to identify the significantly associated factors of dietary diversity of lactating mothers. A P value of <0.05 was considered as a cutoff point to decide statistical significance.

Result: Out of 632 LW aged 15–49 years , almost all of them were interviewed with a response rate of 100% .The proportion of low DDS was about two-third of 413(65.3%) and about 219 (34,7%) had high DDS. In the multivariable analysis after adjusting variables not received nutrition education [AOR=4.17;95%CI (2.69,6.46)] and those who did not have husband support [AOR =1.53;95%CI (1.07,,2.16)], Illness among LW [AOR =2.5; 95%CI (1.66,3.97)], were significantly associated with dietary diversity and they have negative effect on high DD.

Conclusion: Substantial proportion of LW experience low DD. This is Due to the diets predominantly starchy staple, and few fresh fruits and vegetables as well as other associated factors. This low DD was significantly associated with lack of nutrition education, lack of husband support, not consuming variety food, and Illness. The results **imply** the need for attention should be paid requiring to the identified factors of low DD. And strengthening community and institution based nutrition education, health care services with involving

relevant stakeholders to improve dietary diversification in this area, the accessibility of micronutrient-rich foods and health of mothers with their outcomes.

Key Words: Dietary Diversity ,Lactating mothers , Angacha district south Ethiopia 2022

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Acronyms and Abbreviations

ANC	Ante Natal Care
DDS	Dietary Diversity Score
EDHS	Ethiopian Democratic Health Survey
FAO	Food and Agriculture Organization
HEP	Health Extension Program
HSDP	Health Sector Development Program
WDDS	Women’s Dietary Diversity Score
MDDS	Minimum Dietary Diversity Score
WDD	Women Dietary Diversity
FANTA	Food and Nutrition Technical Assistance
IDDS	Dietary Diversity Score
HHDDS	House- Hold Dietary Diversity Score
COR	Crude Odd Ratio
AOR	Adjusted Odd Ratio
PNC	Post Natal Care
HDD	High Dietary Diversity
BMI	Body Mass Index
FDH	Federal Ministry of Health
HFI	House hold Food Insecurity

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CHAPTER ONE: Introduction

1.1. Back ground

Dietary diversity is an important concept in the fight against malnutrition, whether by excess or by default in all age groups, especially in developing countries. It is the secret of a healthy and balanced diet for women.

Dietary diversity determines the number of different food groups consumed by an individual or household over a given period of time. capable of ensuring adequate intake of essential nutrients that can promote good health, physical and mental development of women. Moreover, it is a qualitative measure of food consumption that reflects house hold access to a variety of foods and is also a proxy for the micronutrient adequacy diet of individuals as evaluated by the Minimum Dietary Diversity of Women (MDD-W), that is required to support women's and children's health and nutrition. At the international level, dietary guidelines recommend the consumption of a sufficient variety of foods, which is supposed to ensure adequate intakes of nutrients essential for good health (1).

Some of the strategies utilized to improve a diverse diet included, delivering nutrition information to breast feeding Mather in order to change their behavior regarding to decide nutrition choices and food-based treatments as well as efforts have been made to eliminate micronutrient deficiencies through supplementation and fortification of foods.Hence it is major ways for enhancing the quality of the diet and overcoming diet-related malnutrition and other diseases It ranges two major calcification of diet quality which are macro nutrient and micro nutrient requirements and adequacy .So, our body needs larger amounts of energy and protein than vitamins and minerals for improving our quality of health .

Like in pregnancy, adequate nutrition of the mother during lactation is of vital importance since during the first few months of life, the infant derives all the nutrition from the mother's milk. As the mother has to nourish a fully developed and rapidly growing infant, she needs extra nutrients to meet the baby's needs in addition to her own requirements. Any

inadequacies in her diet influences both the quantity and quality of milk secreted, though the effect on quantity is more. However, the quality of breast milk does not suffer as much with reduced nutrition. Even if the diet is not able to meet her own nutritional needs, the mother draws on her body reserves to meet the needs of lactation at the cost of her own health. Dietary deficiencies of water-soluble vitamins lead to lower levels of these vitamins in breast milk. The protein, calcium and carbohydrate content is not altered even if the mother is malnourished. It is therefore extremely important for the lactating mother to take adequate nutrients so that she can not only nourish her child but also maintain her own nutritional status. Thus, nutritional needs are increased during lactation for sufficient breast milk production and to meet the mother's daily needs.

Globally 840 million people do not have enough food in the world. 14 million adolescent girls become lactating mothers each year and more than 90% of these very young and reproductive mothers live in developing world and the precarious living conditions of households have a negative impact on the dietary diversity of women. The studies show that Ethiopia is one of the countries with highest level of lactating mothers' malnourishment in sub-Saharan Africa. (2)

Among malnutrition types, under-nutrition is a serious problem in Ethiopia. Breastfeeding mothers are particularly exposed to under-nutrition due to their increased physiological requirements. Multiple roles played by mothers (bearing, lactating, serving and feeding others) give rise to a severe health and nutritional problems.. Mothers in age of 15-49 group and children are most exposed to malnutrition due to insufficient dietary diversity, unbalanced distribution of food within house-holds, , infectious diseases and care. Mainly for those women with high nutritional requirements of lactation also contribute expressively to their poor nutritional status (3).

To support lactation and maintain reserves, most mothers in developing nations will need to eat about 500 additional kilo Cal every day (an increase of 20% to 25% over the normal intake before pregnancy). Extra food, therefore, must be readily available to the mother to meet additional demands of pregnancy and lactation (4).

In resource-poor environments across the globe, 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. Those most likely to suffer from deficiencies include infants and young children, and adolescent girls and women of reproductive age. Unfortunately, outside of developed countries very little information is available on women's micronutrient status, but even with limited data, it is clear that poor micronutrient status among women is a global problem, and is most severe for poor women (5).

Dietary diversity score is one of the important measure of dietary diversity that reflects quality and diet adequacy of house hold and individual food consumption and used to determines whether or not respondents acquire sufficient food to meet energy and nutritional requirements. Hence individual dietary score is used to determine how many pre-determined food groups were consumed by a specified target group in the preceding 24 hours.

Studies in different age groups have shown that an increase in individual dietary diversity is related to increase nutrient adequacy of the diet, DD scores have been validated for several age/sex groups as proxy measures for macro and/ or micronutrient adequacy of the diet. Looking at dietary diversity at different points in the agricultural cycle is one way of investigating seasonality of food security (6)

However, Problem of dietary diversity is a serious public health concern in resource-poor countries around the world, particularly in developing countries due to different factors.

Hence, Lactating mothers are most vulnerable population groups for a variety of nutritional deficiencies and diseases, among other because their dietary practice may not be optimal. As a result, the study's aim will be assessing dietary diversity and associated factors among the age of (15-49) years of nursing women in Angacha District South Ethiopia.

1.2. Statement of the Problem:

Diet quality and diet adequacy during lactation periods are essential for maternal and children health and nutritional requirements during lactation greater than during pregnancy they need additional extra meal. Therefore, mothers are among the critical to closely follow and needs giving attention them. Among others, this is because the period of lactation is the time when the mother show highly physiologic change demand and increases for nutritionally rich food items and extra nutritious feeding.(7)

Due to this approximately 500k/cal/day and 25g/day energy and protein are requires respectively in order to gain additional energy to produce 700–800 ml of milk per day. In addition to this, the nutritional status of a lactating mother is directly linked to nutritional status and health state of infants and young children (8–11).

Lactating women who do not get enough energy and nutrients in their diets risk maternal depletion .This aggravates malnutrition due to lack of nutritious rich food (12–14).The quantity of breast milk mainly depends on the feeding nutritional rich food and adequacy of the mother's diet (15). Thus, it is essential that the diet of a lactating mother must rich in both calorie and protein nutrients (16).

Despite higher number of nutritional requirements large number of lactating mothers along with children are among the most Vulnerable groups of population for nutritional deficiency including under nutrition, over nutrition, and micronutrient deficiency problems. detrimental effects of poor nutrition due to many factors that influences the health of the mother and their children (17–19).

Food insecurity and dietary limitations are two important determinants of malnutrition and exposes to many health risk problems. The Food and Agriculture Organization of the United Nations (FAO) defines food security the situation when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preference for an active and healthy life (20).

In another term, a household is considered to be food secured have access to food can results several positive influences, including Economic developments, production and productivity. hence improve living condition of societies as well as countries (21). However, according to the to the statement of Food and Agricultural Organization of United Nation, 41% of Ethiopian lives below the poverty line and more than 31 million populations are undernourished and above 50% of Ethiopian families are food insecure (FMOH, (22–25) Similarly, FAO defines MDD-W refers dichotomous indicator of whether or not women 15 to 49 years of age have consumed at least five out of nine food groups previous day and night (24 hr period) and it is a food group diversity indicator that reflect dietary quality and micronutrient adequacy of an individual and house hold (26).

Remarkably, food adequacy (or enough food to eat) does not sufficiently show eating diversified food or intake of various essential nutrients. Noticeably food security and dietary diversity provide wide range understanding of nutritional well-being. In developing countries including Ethiopia has made significant progress in some important health and nutritional programs that showed in development targets. However, still poverty and malnutrition are a major problem in low income countries and this results Nutritional inadequacy among lactating women and their children(27)

Low dietary diversity is one of the most important causes of both macronutrient and micronutrient deficiencies (28) . Studies conducted in some Asian countries showed that low dietary diversity ranges from 55.2% to 87.8% (29), whereas in African country studies, low dietary diversity ranges from 42.1% to 88.7% (30).

Based on the study finding in developing countries such as Bangladesh, Afghanistan, and Mozambique Malawi prevalence of lower DDS for lactating mothers on average only 28.1% of lactating women meet the mean dietary diversity score from nine food group (31,32).

Evidence from the studies showed that in the rural households of Ethiopia, the dietary diversity were 21.1% ,62.7% and 16.2% as low, medium and high HDD respectively. About sixteen (16.2%) had adequate HDD. Moreover, the mean DDS were 3.4 with the prevalence of having poor/low dietary diversity among lactating mothers were 56.4% which is very high in magnitude (33,34).

According to the EDHS 2016 finding the dietary diversity among lactating mother were low in Ethiopia and the prevalence of adequate dietary among lactating mother were 23.1%,.(35–38). For example, the study conducted in south Gondor shows that only 16.2% had high dietary diversity and about 83.8% of participants had in adequate dietary diversity.(39).

T

he data from our countries have shown persistent, high under nutrition rates in regions and households where staple crop production is predominant and food availability is good. For instance, despite higher agricultural production in West Gojam (highest productivity in the region),about 51% of the mothers who were fed only legumes, cearials, dark green leafy vegetables from nine food groups and 47.6% of mothers who received staple food made from teff, wheat ,maize, barley, etc.) Were found to be low dietary diversity.

The diets of lactating mother reflects not only their own intake but also the diets of their children and families that is maternal dietary diversity is also strongly linked to that infant in the same households to the average household nutrient adequacy (8). In short lactating mothers with higher dietary diversity have children and family with higher dietary diversity (22,40–42).

However, literatures showed that dietary diversity among lactating mothers were very low in Ethiopia. Fore example the study conducted west Gojjam indicats that nearly three fourth of lactating mothers take monotonous food, and the prevalence of high and low dietary diversity score was 10.2% and 53%, respectively (27).

In general evidence show that in our country Ethiopia ,the prevalence of high and low dietary diversity on average ranges between 56.4% and 89.7% respectively (1) , (43).

A number of factors were reported to be associated with mothers' dietary diversity; maternal education monthly income, home gardening, source of drinking water food security, maternal health and season factors such as size of farm land, Occupation, Educational status, unemployment, , were dietary diversity , family size, age at first pregnancy, nutrition education ' level of education, were associated with dietary diversity (8,44).

Previous findings were in our countries in some regions have tried to solve some problem of dietary diversity in different vulnerable groups especially on lactating mothers. To overcome these nutrition problem thy designed goal to reduce maternal under nutrition through dietary diversity intervention by launching national nutrition program (NNP II) among women of reproductive age, (45)

Including these various strategies, programs, policies, are designed to strengthening community based nutrition education intervention through HEP, HSDP and new technologies for increasing farm production and productivity. Therefore, assessing the prevalence of dietary diversity and associated factors among lactating mothers is vital to improving quality of diet taken by lactating mothers. Moreover various studies conducted in different countries in the world tried to solve dietary diversity problem by designing their strategies and programs(46).

Even though, studies were conducted on dietary diversity and associated factors in our countries including developed countries had limited not addressed several areas and there is silenced and not enough. Therefore, lactating mothers' are critically needed in order to prioritize, plan, and implement intervention programs from the finding aimed at improving maternal. Hence, he objective of this study is to determine the dietary diversity and nutrient adequacy including associated factors among lactating mothers in Angacha district of South Ethiopia.

1.3. Significance of the study

Lack of diet quality and diet adequacy were the major problems in low income countries including our country. Due to this lactating are exposed to risk for malnutrition and other health related problems. Therefore, this study will contribute providing the intervention approaches such as, designing new strategies, programs and policies to overcome the diet and dietary diversity Problems by applying from the study result . Moreover, this research will encourage behavioral change as well as awareness on nutrition and dietary diversity for the lactating mothers through providing nutrition education.

On the other hand, this study will also encouraging the community for home gardening to increase accessibility to different vegetables, fruits and other productions. For the institutions and Administrations this study provide approaches to overcome diet and dietary problems by designing , policies. New technologies to increase production and productivity.

Farther more, the finding helps to forward timely and applicable recommendation that helps concerned authorities, health managers of South Regional Health Bureau and its stakeholders to take timely measures to improve dietary diversity. The finding of the study expects to provide updated information on what contributes for the better and appropriate the feeding practices of lactating women and will inform design of the nutrition information, intervention and strategies targeting lactating women. Besides the health provide and others who are interested in the field of maternal health and nutrition in general will be benefit from this research.

CHAPTER TWO: Literature review

2.1. Overview of the Dietary diversity.

Dietary diversity is defined as qualitative and quantitative measure of food consumption that show availability and accessibility to different food and is also determine nutrient Adequacy of items or food groups over a given period of food and used to take a measure about dietary diversity problem of lactating mother based on finding.

At the household level, dietary diversity is usually considered a measure of the economic access of different food while at the individual level it reflects dietary adequacy (47).

A dietary diversity questionnaire can be used to collect information at individual level. The decision about which level to collect information about depends in part on the purpose and objectives of the survey.

Both individual dietary diversity and household dietary diversity have pros and cons, depending on the ultimate goal of the study. If the purpose and objective of the survey are to determine individual dietary adequacy as passing individual dietary diversity score is the best approach. The con to this approach is that it does not determine the nutritional adequacy of individuals in the household.

The FAO rules characterize dietary variety scores as a simple count of food types consumed by a family or an individual during the previous 24 hours.. Since individual food items can be classified into more than one food group, the sixteen food groups were categorized into twelve food groups in order to measure household dietary diversity based on FAO's aggregation of food groups.

For example, vitamin A-rich vegetables and tubers, dark-green leafy vegetables, and other vegetables were merged into a vegetables group; vitamin A-rich fruits and other fruits were combined into a fruit group; and the meat group is a combination of organ meat and flesh meat (48).

Moreover FAO's guidelines states for assessing dietary diversity, lactating mothers were selected prior to the start of the data collection. The respondent is asking about all the foods he/she consumed the previous day, inside and outside the home.

Objective of reviewing is to help the researcher contributing new knowledge about existing research what it addresses or known and what not addressed. In addition to this, it is used to place own research with in the context of existing literature making for why further study is needed and assessment of the current state on a topic.

2.2. Factors Affecting dietary Diversity

2.2.1. Socio Economic Factors

Socioeconomic factors namely, average income, wealth index, home gardening ,source of drinking water, and food insecurity are the major challenges caused by lack of production and productivity including enabling to use new technologies. Due to this lactating mothers and their children were exposed to risk for nutrition related deficiencies and other disease.

Studies conducted in Axsum tигра show that lactating mothers having food insecurity, low income and less home gardening have less likely of dietary diversity than from having food secured, good income and high gardening (49).

From Another study conducted in Finote selam indicate women's having nutrition information, Employed women, food secured, high and income were more likely to have adequate dietary diversity than having no receiving nutrition information, less monthly income, and food in secured women.

Moreover, study conducted in India show that the prevalence of lactating women with MDD were higher among having household with high income and who gaining nutrition information were more likely feeding dietary diversity food (50).

Hence, dietary diversity is highly associated with household economic status. People with high socioeconomic status have more likely to have healthy **diet** (51). whereas women's with lower socioeconomic status have less dietary DD of essential food, hence, contributing poor health of lactating women as well as her children (34).

2.2.2. Socio-demographic Factors.

Chance of affordability accessibility food increases when the family size have less and educated women because educated women have opportunities to employment and easily understand information how behavioral changing could be performed regarding general overview dietary diversity as well as advantages of using nutrition rich feeding.

Evidence from aksom and south Ethiopia indicating that Lactating mothers who have more Educated having less family size and Employed were positively correlated to high dietary diversity than less/no Educated ,having high family size and unemployed mothers (52).

Another evidence showing from Finote selam in Ethiopia unmarried, and high family size women were inadequate dietary diversity whereas, married and less family size women' shave more *dietary diversity*. Because of unmarried women are not taking attention about feeding diversified diet due to luck of information about essential nutrition and other factors. Similarly when family size is high accessibility of food decreases due to high requirements (38).

2.2.3. Health and diet related Factors

Evidence from debub bench showing that women's receiving nutrition information and good healthier more likely know about nutrition and dietary diversity than not receiving nutrition information and it is very important to encourage healthier behavior and to impeding unhealthy behavior regarding using dietary diversity, dietary habits and dietary pattern Respondents who have enough information they can make decision for healthy life style (53).

Summary of Literature Review

Diverse literature reveals that dietary diversity is indeed strongly associated with nutrient adequacy. Discussed literature further reveals that micronutrient deficiencies among lactating women remain major public health concern in developing countries.

Despite the relationship between dietary diversity and nutrient adequacy being clearly documented there exist limited information on dietary diversity. This study therefore sought to determine dietary diversity among lactating women in Angacha District South Ethiopia.

2.3. Conceptual Frame work to assess DD and Associated factors among LW

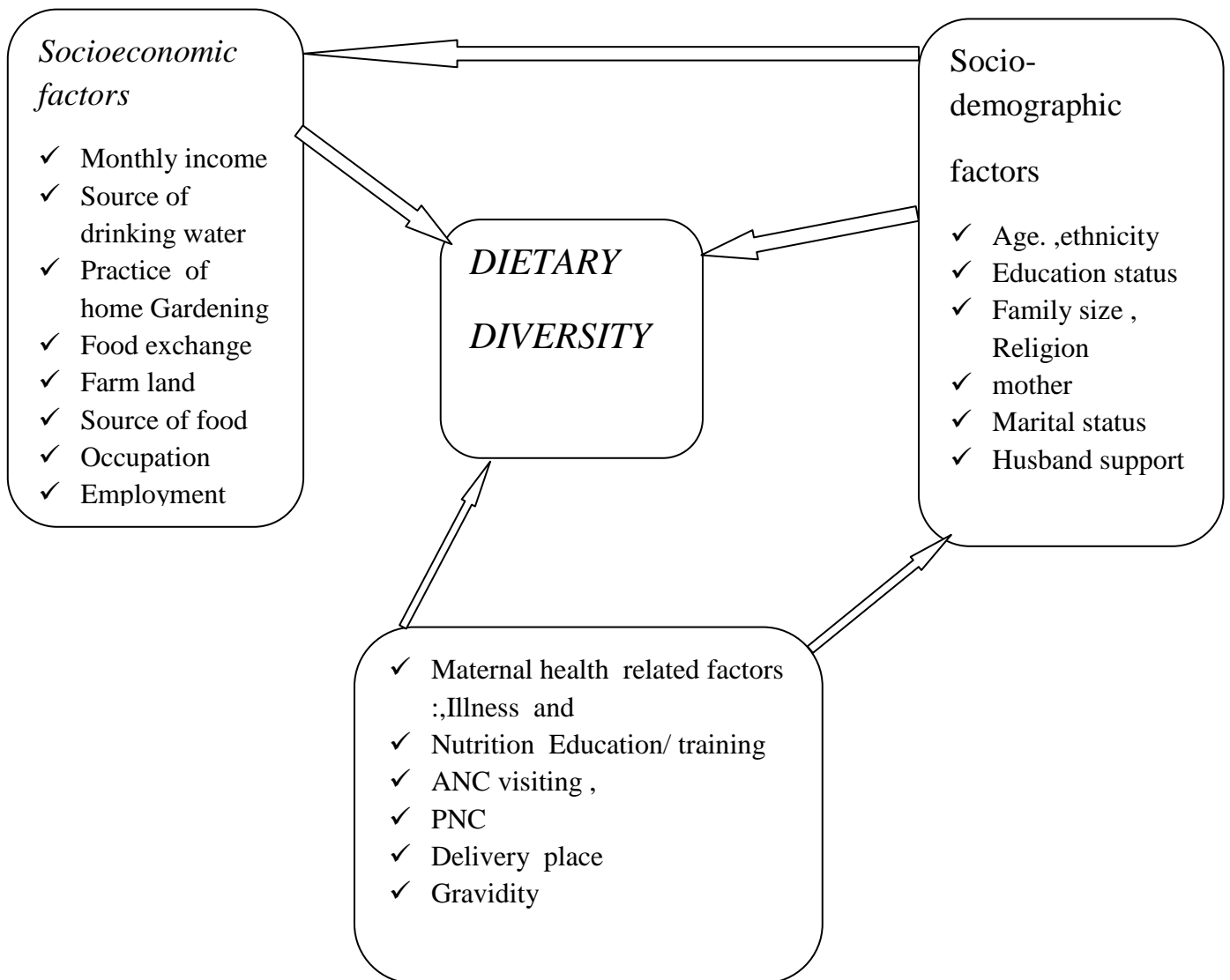


Figure 1. illustrates the various factors that influence maternal dietary diversity

Diversified diet is positively correlated with nutrient adequacy. However, dietary diversity may be directly affected by individual health factors such as . Illness affects food intake, absorption and utilization of nutrients and Nutrition education also increase knowledge about the benefits of taking diversified food during lactation. Similarly, dietary diversity is also influenced by demographic factors such as maternal age, gender, household size and parity. Socio-economic factors such as income, home gardening, occupation and education of spouse and mothers are also known to influence dietary diversity as shown in figure 1.

CHAPTER THREE: OBJECTIVES

3.1. General objective

To assess dietary diversity and associated factors among lactating women in Angacha district South Ethiopia, 2022

3.1.2 Specific objectives

To assess dietary diversity among lactating mothers in Angacha district South Ethiopia

To identify factors associated with dietary diversity among lactating women in Angacha district South Ethiopia.

CHAPTER FOUR: Methods and Materials

4.1. Study Area

Study was conducted in Agacha District in the region of south Ethiopia which is located at 654 and 447 KMs away from the capital city of Ethiopia (Addis Ababa), and the regional capital city Hawassa respectively.

According to the 2016 kambata Tembaro zone finance and economic development projection, a total of (126,768) population are living in the district (of which 63,290 female and 62,768 male).

Administratively Angacha has 22 (5 urban and 17 rural) keble. According to the 2016 bi-annual report of the Angacha District health office, there were 2,848 LW in the district currently. It has one primary hospital, 5 public health centers, and 22 Health Post. The main agricultural products of the district are Grains, potato, sorghum, pea and beans, barley, tef, inset and vegetables (cabbage, carrots, and tomatoes) are the primary agricultural products.

4.2 study period

The Study period was from June to July 2022

4.3 Study design

Community based cross-sectional study design was conducted

4.4. Population:

4.4. Target population

All Lactating women (15-49 years) age who are living in Angacha District to whom conclusion/generalization were made from research finding.

4.4.1. Source Population:

All Lactating women who lived in selected Keble from whom sample were drawn to study and living at least six months in Angacha District

4.4.2 Study Population.

All randomly selected lactating women from whom data were collected to study who live in selected Keble.

4.4.3 Study unit

All individual lactating mothers that were selected by simple random sampling and participated in the study

4.5 Eligibility criteria

Inclusion criteria:

- Lactating women who lived at least six months and above in the study area and willing to participate in the study.

4.5.2. Exclusion Criteria:

- ✓ Seriously ill, physical deformed, unable to talk and who are not willing participated mothers were excluded from the study participation.
- ✓ Lactating women who have a child aged greater than 24 months
- ✓ Lactating women age less than 15years and greater than 49 years

4.6. Sample Size Determination and sampling technique

4, 6.1 sample size determination

Sample Size of the study was determined ,by using single population proportion formula taking the prevalence of good dietary diversity score of 47.8% for Lactating women (54). With the assumption of 95%confidence level, 5% margin of error, 10% non-response rate and 1.5 design effect.. Therefore, the minimum sample sizes was 421. As it is multistage sampling technique 1.5 Design effects is used. Then the final sample size of the study were 632

$$n = \frac{(Z_{\alpha/2})^2 \cdot P(1-P)}{d^2} \quad \text{Where: } Z_{\alpha/2} = 1.96$$

CI at 95% Standard normal distribution

d =Margin of error (0.05)

p= proportional of individual dietary diversity score (47.8%)

$$n = \frac{(1.96)^2 (0.478)(1-0.478)}{(0.05)^2} = 0.9585/0.0025 = 383 \quad \text{Adding 10\% non-response rate} = 421$$

And when using the design effect of 1.5=632 so the final sample size were 632

4.6.2 Sampling technique

The study participants were selected using a multi-stage sampling technique. The Angacha district has a total of 22 Kebeles, from which 7 Kebeles are selected randomly. The sample sizes for each Kebele are proportionally allocated based on the total number of lactating women in each selected Kebele (from the health extension worker's family folder). Finally, study participants were selected using a simple random sampling method, a lottery method was used to select one participant.

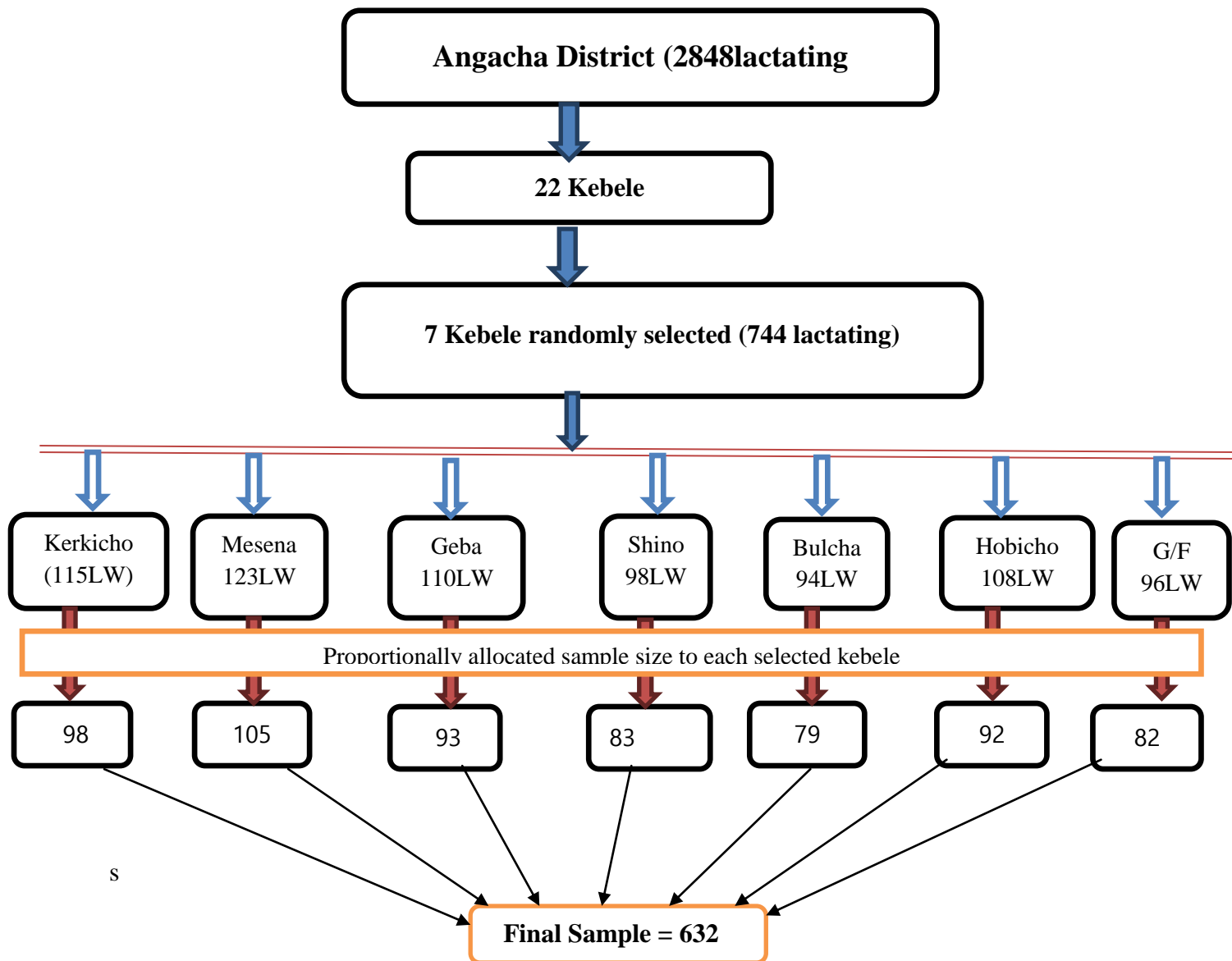


Figure 1: Schematic presentation of sampling procedure

4.7. Data collection Procedure and Instruments.

Data were collected from respondents via an interviewer-administered questionnaire. First, English version of the questionnaire was prepared and translated in to Amharic and local language then back to English by language translators in order to check for consistency.

The questionnaire contains four main parts namely the first and the second part were asked about socio demographic and socioeconomic, third part health and disease characteristic of the respondents, and the fourth part were Dietary Diversity questionnaire respectively.

Twenty-four hour dietary recall methods were used to assessment food group consumption of all the nine food groups eaten and beverages taken. Starchy Staple; Dark green leafy vegetables; Vitamin A rich Vegetables and Fruits, Legumes Nuts and Seeds; Dairy products ;Meat, Poultry, Fish; Eggs; Other Vitamin A rich Fruits/Veg; Other Vegetables and Other Fruits

Dietary Diversity were measured by summing up the number of food and food groups consumed over a reference period and count based Women's Dietary Diversity Score (WDDS) was calculated for each LW during the previous 24h to classify the mother's dietary diversity (dichotomous) as percentage of high DD (≥ 5 food groups) or low DD (< 5 food groups) from nine food groups.

Then, the out come variable coded as a high DD ≥ 5 food groups as “1” and low DD < 5 food groups as “0” for logistic regression analysis. The score of the respondents has taken, and respondents were classified as having high DD and low DD by taking their responses. Hence, LW who consume more than five food groups in the last 24h classified as having high DD and less than five food groups were low DD.

The measurement of weights of the lactating mothers was done and recorded to the nearest 0.1kg by using calibrated portable electronic digital scale (slater; Seca, Germany model) and heights were measured to the nearest 0.1cm by using a portable height measuring board with a sliding head bar. These measures of height and weight were done three times with out shoes and with a possible light closing the mother faced away from the scale. The result of height and weight were recorded on the questionnaire and used to calculate the body mass index (BMI) to determine nutritional status of the lactating mothers

4.8. Study Variables

4.8.1. Dependent variable

- ✓ Dietary Diversity

4.8.2. Independent variables

Socio demographic characteristics, Socioeconomic characteristics, Personal /Health related factor and Dietary related factors Such as, age, religion, marital status, family size,, place of residence, occupation of mother, occupation of spouse, educational status of the mother, educational status of the spouse, source of drinking family income, home gardening Maternal and health related factors, ,ANC follow-up, food varieties nutrition education, Delivery place and PNC service

After generating the number of diversified food types consumed by the mothers using FAO's manual the dichotomous (WDDS) dietary diversity score was calculated and uses to classify low, and high diversity score(55)

4.9. Operational Definition:

Minimum Women Dietary Diversity Score (MWDDS is assessing the proportion of lactating women age from (15-49) who have consumed at least five out of nine food groups the previous day and night.

Diet diversity score: is the sum of food groups eaten in the previous 24 hr, serves as a proxy indicator of nutrient adequacy of an individual's diet. Low dietary diversity (<3 mean food groups consumed) and high dietary diversity greater than or equal to five food groups consumed. The diet was classified according to the 9 food groups recommended by the FAO

High dietary diversity Score: is when lactating women consuming greater than or equal to five food groups.

Low dietary diversity score: is average consumption of less than or equal to three food groups.

Women's Dietary Diversity Score (WDDS) is the dichotomous variable which identifies the percentage of the population with low versus minimum dietary diversity.

4.10. Data quality control

Data quality was assured by proper designing of the questionnaire. The tool was prepared in English and translated to Amharic and local language and back to translated to English to see its consistency.

The questionnaire was pre-tested on 5% of the sample size in non selected neighboring kebele. One Health officer supervisor and two nurses including HEW as assistances were recruited trained for one day on how conducted the data collection and supervision, on the objective, the relevance, confidentiality of information, respondent's right, time of data collection, and submission on time. respectively.

After completion of data collection, each questionnaire was checked for completeness and consistency and corrective measure was taken accordingly on a daily bases accordingly. Anthropometric measurements were standardized by giving training for data collectors and instruments was calibrated each day . EPI data version 3.1 was used to improve data quality.

4.11. Data Processing and analysis Procedure

The data were cleaned, coded and entered into EPI-INFO version 3.1 software and transferred and analyzed using SPSS version 26. Descriptive statistics such as, frequencies, proportions, chi-square (χ^2) were used to present the study result and summery measure (mean value, standard deviation) was done for checking response rate of respondents.

Bivariable logistic regression was done to select candidate variables. Finally all independent variables that had p -value <0.25 in bivariable analysis were entered in to the multivariable logistic regression model was used identify for factors associated with dietary diversity and statically significance was defined at a P -value of less than 0.05 and to control the effect of confounding. Multi-co linearity was cheeked by Variable Inflation Factors and maximum VIF was 2.04 and model goodness of fit by Hosmer-Lemeshow with P -value =0.94. Odds Ratio along with 95% CI estimate were used to measure strength of the association

4.12 Ethical consideration:

Ethical approval had obtained from the research ethical review board (RERB) Ju of institute of Health. The letter was submitted to Angacha district health office. An official permission letter from the office obtaining for the other office and the permission letter from the district health office was submitted to the data collecting keble administrative office.

All lactating mothers were informed about the objective of the study. Then after the objectives of the study had explained, all mothers' age 15--49, informed verbal consent from every LW will be obtained before the interviews.

The right to participate or refuse from the study at any time without any requirement is disclosing to the participant clearly. Moreover, confidentiality of the data obtaining from participants is keeping by all data collectors and investigators by using code numbers.

4.13: Dissemination plan

The results of the study will be presented to Jimma University institute of health, as part of the MSc thesis, distributed to the Angacha woreda Health office, and other organizations concerned about dietary diversity among the lactating women. The findings may also be presented in different seminars, meetings, and workshops and be published in scientific journals.

Chapter Five: Result

Introduction: This chapter presents the study findings. Data on a comprehensive sample of 632 respondents were collected and reported. The results are organized as per the specific objectives of the study namely; socio-demographic and socio-economic characteristics of the respondents, health related characteristics of respondents dietary diversity of respondents. The results on the association between dietary diversity and demographic factors, socio-economic status, health characteristics of respondents among the study respondents are also presented.

5.0 Description of the Study Population

5.1.Socio- demographic and Socio- economic characteristics of LW

A total of 632 lactating mothers aged 15—49 years interviewed, for this study with a response rate of 100%. The mean \pm Standard deviation (SD) of the respondents age was 32.29 \pm 8.4 years and majority 248 (39.2%) of them were between 36 and 49 years of age. and 553(87.5%) participants were house wives followed by 9.5% employees.

Out of the total samples, most of the mothers (44.0%) were Primary and their spouses (46.5%) had secondary and above educational status. The residence of most mothers was rural, and 252(39.9%) of mothers had a family size of between four and five .

Majority of the Respondent 417(66.0%) were Protestant religion followers and 572(90.5%) were from Kembata ethnicity and most of the lactating mothers 309 (48.9%) had monthly income of less than 2000 ETB. Less than 50% of the respondents had having a home gardening and majority of respondents got food source from their own farm production 586 (93.2%).

Table 1 : Socio demographic and Socio economic characteristics of LW at Angacha District in south Ethiopia 2022

Variables	Categories	(n=632)	Percent (%)
Age	36-49	248	39.2
	26-35	211	33.4
	15-25	173	27.4

Residence	Rural	594	94.0
	Urban	38	6.0
Current Marital Status of Mother	Married	628	99.4
	Unmarried	0	0
	Divorced	3	0.6
Religion	Protestant	417	66
	Orthodox	97	15.3
	Catholic	87	13.8
	Muslim	31	4.9
Ethnicity	Kembata	572	90.5
	Gurage	27	4.3
	Amhara	25	4.0
	Oromo	8	1.3
Education of mother	Not learned	165	26.1
	Primary	279	44.1
	Secondary	140	22.2
	Tertiary	48	7.6
Education of Father	Not learned	45	7.1
	Primary	255	40.3
	Secondary	294	46.5
	Tertiary	38	6.0
Current Occupation of Mather	House wife	553	87.5
	Farmer	19	3.0
	Employer	60	9.5
Current Occupation of Father	Employer	66	10.4
	merchant	125	19.8
	Farmer	441	69.8
Family Size	<=3	178	28.2
	4-5	252	39.9
	6-7	125	19.1
	>=8	81	12.8

Home gardening	Yes	250	39.6
	No	382	60.4
Farm land access	Yes	266	42.1
	No	366	57.9
Family /month Income	<2000ETB	309	48.9
	2000-4000ETB	232	36.7
	>4000ETB	91	14.7
Source of water	Private Tap	225	35.7
	Public Tap	300	47.5
	well	79	12.5
	Spring	27	4.3
Source of food	Own Production	589	93.2
	Purchasing	42	6.6
	Food Aid	1	2

5.2. Health Related Factors of Lactating Women.

The finding indicates that 300 (47.5%) LW were getting the water from the public tap . Almost all participants had a functional toilet with 616(97.5%). 631 (98.9%) of LW had greater than or equal to one Antenatal care(ANC)”follow-up,and from these greater than two-third of LW had more than two times follow-ups in the last pregnancy ,but only 266(42.1%) of LW have had Post natal care (PNC) follow-up to the previous delivery.

Most LW 620 (98.3%) have got F/P service and 99 (15.7%) of LW had a history of illness in the last two weeks. 517 (81.8%) of LW gave birth at HC, and all LW practice exclusive breast feeding.. Furthermore, (66.3%) of mothers not have gotten nutrition education during ANC follow-up and most 485 (76.7%) of the respondents were multigravida mothers.

Among the total participants 609 (96.4%) had consumed between 2-- 3 meal per day within past 24hrs and the rest 22(3.6%) had consumed more than three meals per day within the past 24hrs. and most LW 476 (75.3%) have not consumed two

additional meal per day with in 24hrs. More than half of the respondents 368 (55.1%) were history of meal skipping during 24hrs and one-third (34.7%) of the study mothers have high dietary diversity, and the rest 66.3% of the respondent have low dietary diversity.(Table 2)

Table 2: Health Related Factors of LW at Angacha District in south Ethiopia 2022.

Variables	Categories	(n=632)	Percent (%)
Source of drinking water	Private Tap	225	36.7
	Public Tap	300	47.5
	Well	79	12.5
	Spring	27	4.3
Functional Toilet Service	Yes	616	97.5
	No	16	2,5
Nutrition education services during ANC	Yes	219	34.7
	No	413	66.3
Family Planning Service	Yes	620	98.1
	No	12	1.9
Method of family Planning	Implanol	237	37.5
	Nor plant	183	29.0
	IUCD	114	18.0
	Depo	98	15.5
ANC follow –up in the last pregnancy	1 time	1	2
	2-3 time	609	96.4
	>=4 times	22	3.5

Place of delivery	HC	517	81.8
	Home	40	1.6
	Hospital	105	16.6
PNC Service	Yes	266	42.1
	No	366	57.9
Gravidity	Prime	147	23.3
	Multi gravida	485	76.7
History of disease in previous two weeks	Yes	99	15.7
	No	532	84.3
Vaccination service of mother	Yes	437	69.1
	No	196	30.9
Meal frequency	1 times	1	2
	2—3 times	609	96.4
	>= 4 times	22	3.5
Eating two additional food/day	Yes	156	24.7
	No	476	75.3
Meal skipping	Yes	284	44.9
	No	348	55.1
Husband support	Yes	390	61.7
	No	242	38.3
Exclusive Breast feeding	Yes	442	69.9
	No	190	30.1
Complementary feeding practice	Yes	316	50
	No	316	50
Vaccination for children	Yes	600	94.9
	No	32	5.1

5.3. Dietary Diversity of LW at Angacha District in south Ethiopia.

From the total 632 participants previous 24 hours recall dietary diversity assessment indicated that the average dietary diversity of the mean \pm SD was 1.69 ± 0.47 . The magnitude of low dietary diversity score was nearly two three of the lactating mothers had 413(65.3%) (consumed < five food), and 219 (34.7%) were with high dietary diversity score (consumed \geq five food groups

Regarding food group consumption the majority of women two-thirds 437 (65.5 %) consumed starchy staples and 328 (52.9%) of them consumed dark green vegetables and 304 (47.1%) of them did not have any green leaf vegetable in previous 24 hours.

The participants also reported that only (48.6%) of them got source of vitamin A with in the previous 24 hours and the rest (51.4%) had no vitamin A sources. Out of the total participants only 153(24.2%) of them reported that they had consumed meat and fish. whereas 283(44.8%) of the participants consumed dairy products within 24 hours,

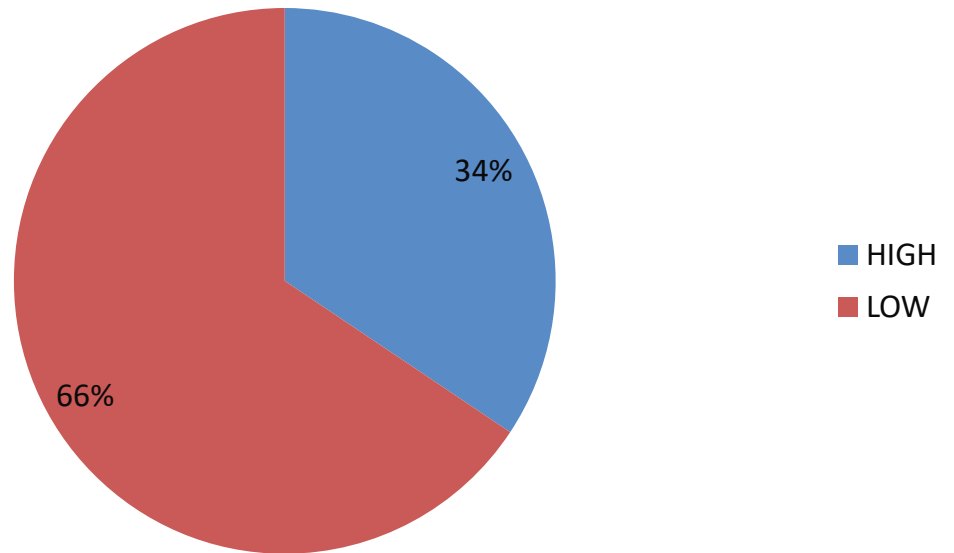
Similarly, 47.9% consumed legumes ,nuts and seeds, 47.65,and 44.8% consumed both Egg and Dairy products, and 50.1% consumed other fruits in the previous 24 h during their lactation period respectively. .(Table3)

Table 3 : Summaries of the DDS and Percentage of mothers consuming each of the nine food groups

Variables	Categories	(n=632)	Percent (%)
Starch Staple foods	Yes	437	65.5
	No	195	34.9
Dark green leafy vege	Yes	328	52.9
	No	304	47.1

Vit A rich fruits and Vegetables	Yes	307	48.6
	No	325	51.4
Legumes, nuts and Seeds	Yes	303	47.9
	No	329	52.1
Meat and Fish	Yes	153	24.2
	No	479	75.8
Egg	Yes	301	47.6
	No	313	62.4
Diary Products	Yes	283	44.8
	No	349	55.2
Other vita A rich vegetables and fruits	Yes	278	44.0
	No	354	56.0
Other fruits and vegetables	Yes	316	50.1
	No	315	49.9s
Measure of women Dietary Diversity	High	219	34.7
	Low	413	65.3

Fig3:Show proportion DD OF LW at Angacha District south Ethiopia 2022



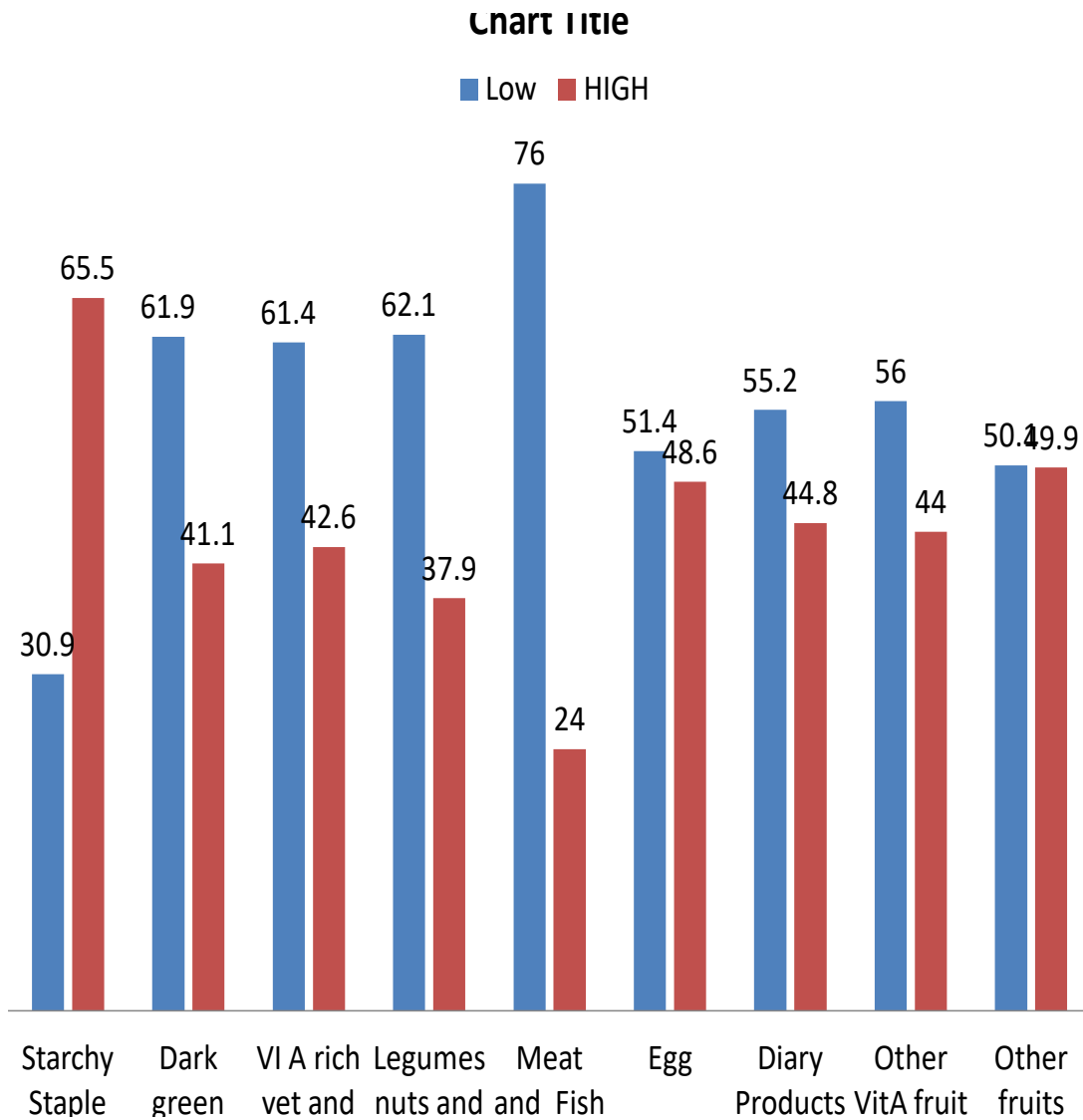


Figure 2. Proportion of Consumption of foods by respondents based on food groups.

5.4. Nutritional status of Lactating mother

This study found that about 65(10.3%) of the lactating mothers were under weight while most of the lactating mothers 533(84.3%) were normal according to BMI. The prevalence of overweight was 34(5.4%) among lactating mothers in Angacha District.

Table 4 :Antropometric measurements of lactating mother in Angacha District 2022

<i>Variable</i>	<i>Categories</i>	<i>(n=632)</i>	<i>Percent (%)</i>
<i>BMI</i>	<i><18.5kg/m²</i>	<i>65</i>	<i>10.3</i>
	<i>18.5-24.9kg/m²</i>	<i>533</i>	<i>84.3</i>
	<i>>25kg/m²</i>	<i>34</i>	<i>5.4</i>

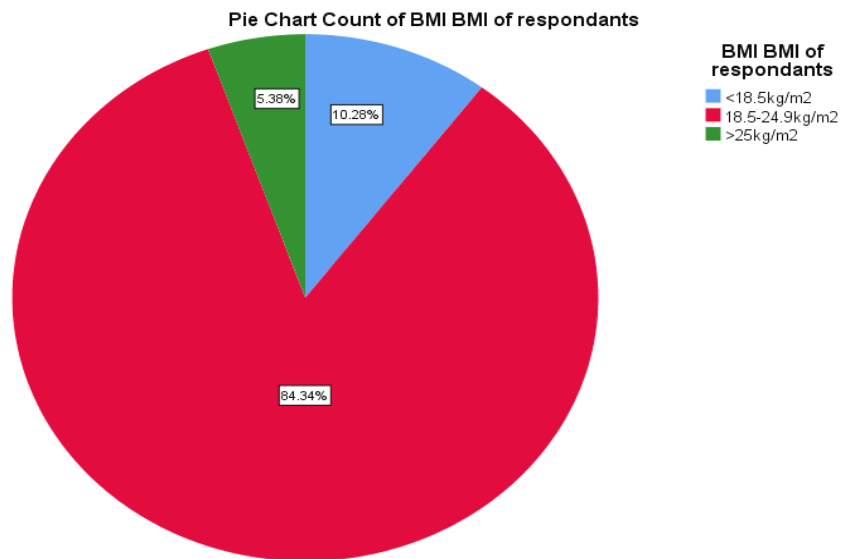


Figure 3. BMI of Lactating Women

5.5. Factors associated with Dietary Diversity of lactating mothers in Angacha District south Ethiopia 2022.

To identify factors associated with dietary diversity among lactating mother, both bivariable and multivariable logistic regression models were used. Accordingly, factors that were associated with dietary diversity of a lactating mother under binary logistic regression were, educational status of lactating women, occupation of mother, family size, source of drinking water, consuming variety food ,husband support, ANC visit, nutrition education, Illness, a P-Value of < 0.25 and become a eligible for multivariable logistic regression analysis significantly associated with dietary diversity lactating women . (Table5)

Table 5 : Binary logistic regression showing that factors associated with dietary diversity of lactating mothers at Angacha District south Ethiopia 2022.

(n=632)

Variables	Categories	Dietary Diversity		P-Value	CO [95%CI]
		High n(%)	Low n(%)		
Age	15-25	54(31.2)	119(68.8)	0.9 0.08	1 0.97 [0.6,-1.5] 1.43[0.4,-1.0]
	26-35	67(31.8)	144(68.2)		
	36-49	98(37.5)	150(60.5)		
Residence	Rural	207(34.8)	387(65.2)	0.682	0.86 [0.6,-1.74] 1
	Urban	12(31.6)	26(68.4)		
Religion	Protestant	138(33.1)	279(66.9)	0.31	0.68(0.69,-3.06)
	Orthodox	36(37.1)	61(62.9)	0.63	0.81(0.53,-2.78)
	Catholic	32(36.8)	55(63.2)	0.61	0,8(0.53,-2.85)
	Muslim	13(41.9)	18(58.1)		1
Education of Mather	Not Learned	51(30.9)	144(69.1)	0.25 0.572 0.25	1 0.6[0.34,1.31] 1.4 [0.4,1.07] 0.94[0.078,0.708*
	Primary	100(35.8)	179(64.2)		
	Secondary	56(40)	84(60)		
	Tertiary	12(75)	36(75)		

Education of Father	Not Learned	29(64.7)	16(35.6)		1
	Primary	168(65.9)	87(34.1)	0.93	1.05 [0.43, 2.59]
	Secondary	192(65.3)	102(34.7)	0.74	1.12 [0.55, 2.28]
	Tertiary	24(63.2)	14(36.8)	0.79	1.09 [0.54, 2.21]
Occupation of Mother	House wife	355(64.2)	198(35.8)		1
	Farmer	15(78.9)	4(21.1)	0.23*	0.47 [1.34, 1.41]
	Employer	43(71.7)	17(28.3)	0.57	1.41[0.4,1.2]
Occupation of Father	Employer	44(66.7)	22(33.3)		1
	Merchants	79(63.2)	46(36.8)	0.67	1.16 [0.47, 1.62]
	Farmer	290(65.8)	151(34.2)	0.61	0.96 [0.59, 1.36]
Family Size	<3	59(33.1)	119(66.9)		1
	4-5	83(32.9)	169(67.1)	0.96	1.009[0.67,1.51]
	6-7	51(42.1)	70(57.9)	0.11	1.4[0.42.1.09]
	>8	26(32,1)	55(67.9)	0.86	0.95[0.59,1.83]
Practicing Home gardening	Yes	158(63.2)	92(35.8)		1
	No	255(66.8)	127(33.2)	0.010*	1.16 [0.83 ,1.63]
Farm land Possess	Yes	175(65.8)	91(34.2)		1
	No	238(65)	128(35)	0.84	0.253 [0.08,0.759]
Nutrition education	Yes	118(53.9)	101(45.1)		1
	No	101(24.5)	312(75.5)	0.01	3.60 [2.5,5.11]
Family monthly Income	<2000ETB	203(65.7)	106(34.3)		1
	2000-4000ETB	151(65.1)	81(34.9)	0.87	1.03 [0.63, 1.69]
	>4000ETB	59(64.8)	32(35.2)	0.98	1.01 [0.608, 1.68]
Main Source of drinking water	1.un protected well	76(16.40)	189(86.3)		1
	2 public Tap	336(81.6)	30(13.7)	0.13*	1.42[1.90, 2.25]
ANC visit at last pregnancy	1 time	1(100)		1	1
	2-3 time	402(66)	207(34)	0.00	0.00
	>=4 time	10(45.5)	12(54.5)	0.1	4.49 ,(0.00)

Fig6:Proportion DD of LW by Age cate.

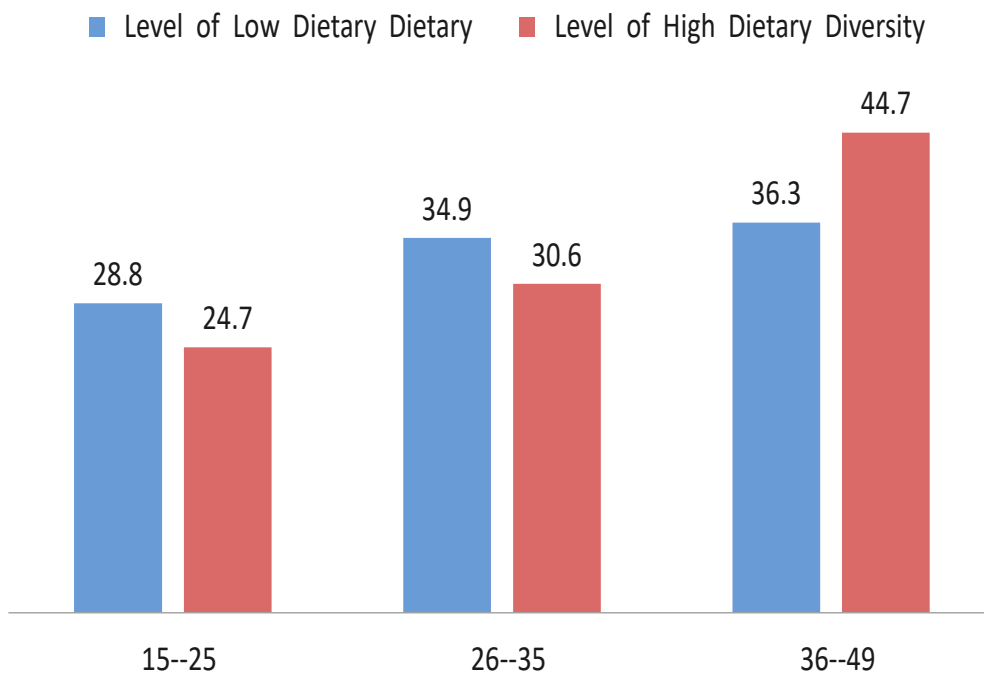


Figure 4 : Proportion DD of LW by Age cate

On multivariable logistic regression model analysis by taking other variable constant, Participants who did not get nutrition education were 4.17 times more likely to have low dietary diversity compared to those who did get nutrition education [AOR = 4.17; 95% CI ;(2.69,--6.46)] . Lactating mothers who did Illness were 2.59 times more likely to have low dietary diversity than those who did not Illness [AOR = 2.59 ; 95% CI; (1.6,-3.9)] .

Similarly, lactating mothers who did not have husband support were 1.5 times less likely to have low dietary diversity compared to those to have got husband support . [AOR =1.53 ; 95% CI ; (1.07,--2.16)] were significantly associated factors of dietary diversity. (Table6).

Table 6 : Showing both bi-variable and multivariable logistic regression model analysis factors associated with dietary diversity of lactating mothers at Angacha District in south Ethiopia 2022.

(n=632)

Variables	Categories	Dietary Diversity		P- v	COR (95%CI)	AOR (95%CI)
		High n (%)	Low n(%)			
Husband Support	Yes	151(38.7)	239(61.3)	0.006	1 1.61[1.14,2.28]	1 1.51[1.032, 1.6]**
	No	68(28.1)	174(71.9)			

Education of Mather	Not Learned	51(30.9)	144(69.1)		1	1
	Primary	100(35.8)	179(64.2)	0.25	0.6[0.34,1.31]	0.74[0.21,2.63]
	Secondary	56(40)	84(60)	0.572	1.4 [0.4,1.07]	0.590 [0.17,2.1]
	Tertiary	12(75)	36(75)	0.25	0.94[0.078,0.708*]	0.49[0.14,1.65]
Occupation of Mother	House wife	198(35.8)	355(64.2)		1	1
	Farmer	4(21.1)	15(78.2)	0.17*	2.09 [1.34, 1.41]	0.72[0.39,1.29]
	Employer	17(28.3)	43 (71.7)	0.57	0.7[0.4,1.2]	1.59[0.45,5.53]
Nutrition education	Yes	118(53.9)	101(45.1)		1	1
	No	101(24.5)	312(75.5)	0.01	3.60 [2.5,5.11]	4.17 [2.69,16.46]**
Family Size	<3	59(33.1)	119(66.9)		1	1
	4-5	83(32.9)	169(67.1)	0.96	1.009[0.67,1.51]	0.96 [0.5,4.7]
	6-7	51(42.1)	70(57.9)	0.11	1.4[0.42,1.09]	0.94[0.56,1.6]
	>8	26(32,1)	55(67.9)	0.86	0.95[0.59,1.83]	0.63[0.34,1.15]
Water Source	Public Tap	67(38.3)	109(61.7)	0.32	1.22[0.88,1.7]	0.81[0.56,-1.18]
	Un protected well	152(33.3)	304(61.7)		1	1
Illness in last pregnancy	Yes	367(69)	165(31)	0.001	2.56[0.25,0.6]	2.59 [1.6.-4.0]**
	No	46(46.5)	53(35.5)		1	1
ANC visit at last pregnancy	1 time	1(0.2)	0		1	1
	2-3 time	402(66)	207(34)	0.056	4.49[0.00]	2.3[0.9, 5.5]
	>=4 time	10(45.5)	12(45.5)	1.00	1.0 [0.001]	2[0.00]

Bold **Star** Indicates significantly associated variables with dietary Diversity of Lw.

Chapter Six: Discussion

Dietary Diversity is a key element as an assessment of adequate and appropriate diet. However, the nutritional problem in lactating mothers is a serious public Health problem due to food insecurity, poor utilization of health care, health education and the existence of communicable and non-communicable disease (56). The aim of this study were to assess Dietary Diversity and associated factors of lactating women in Angacha District in southern Ethiopia 2022

This chapter discusses the study findings in relation to the study objectives as well as how the results compare with other related research findings.

The value of a diverse diet has over time been recognized and is highly recommended since it is strongly and positively associated with nutrient adequacy (57). Majority of the mother in this study had a low dietary diversity with 65.3% of the lactating women and 34.7% of them had high DDS.

Most diet were predominantly cereal based in this study and the *highest* consumed food were starchy Staple and dark green leafy vegetables 65.54% ,52.9% consumed by lactating women in previous 24 hr respectively.

Therefore, large proportion of the lactating women in the study area have good access to carbohydrate and fats and oils. However, only little or few proportion (24.2% ,40% ,44.6%) could access Protein (Meat and fish, Egg. and Dairy products),and due to the *least* consumed food groups respectively. As well as, vitamins and minerals sources were consumed minimally.

This finding is almost consistent with the finding of other similar to those previously reported study conducted in Burkinafaso and Vietnam respectively. (49,58).

The low dietary diversity score observed in this study could be explained as a reason that there might be data collected seasonal variation, and socio economic status of house hold could affects the accessibility and availability of dietary food including lack of knowledge about benefits of nutrition during lactation period.

The finding of the present study reveal that a significant proportion (65.3%) lactating mothers had low dietary diversity score which is almost similar and nearly consistent with the findings of the study conducted in Nepal, South Africa in Nyandeni District showed that about 63.8% Bangladeshi (64.6%) and also Pawi District (63.2%), Bale Zone, North East Ethiopia (65.5%) respectively (29,44,59,60). These similarities might be explained as socio-economic, and having knowledge about nutrition, and seasonal. This indicates both areas gain similar access of diet were the reason for similarities,

On the other hand the low dietary diversity findings result of this study is *lower than* with study conducted in south Gondar zone (83.8%), and Dedo and Chekorsa District Jimma zone (67.9%), Finote Selam District (76.9%), and Debub Bench (72.4%) respectively (61–63).

The reason of these study have low dietary score differences were might be because difference in the study period which can result diet accessibility and availability changes, (food security changes), nutrition knowledge about consuming diversified diet and geographical variations (for example in most parts of Ethiopia produce many types of food varieties like Tuber crops, fruits and vegetables, teff and cereals), while these countries may not cultivate such type of food variety, these factors are possible causes of variation in DD of LW. including socio-economic factors are the cause for the differences.

In addition to that, low dietary diversity finding result of current study were *higher* as compared to the relevant study done in Debre Tabor (25.9%), Aksum Tigry (56.4%), Shashemane, Ethiopia, Pakistan (36.4%), and Kenya (32.6%) respectively (22, 28, 60, 61). The reason for the difference might be due to the study setting, and seasonal variation characteristics in which most crops are not cultivated and the studies participants have less socio-economic status, negligence and lack of nutrition knowledge of the community about benefits during lactation period, may be possible reason for differences as compared this previous studies.

Further more, there is strong association between nutrition education and dietary diversity of lactating women (66). Therefore, the current study of the finding indicated that nutrition education was significantly associated with low dietary diversity and participants who did not get nutrition education were 4.17 times more likely low dietary diversity than participants who did get nutrition education . This finding was *greater than* to study conducted in sidama, Ethiopia, (veitnam, Bangladish and Phillippienes) respectively. (67–70) This might be because the dissemination of appropriate nutrition education in these countries were better than from current study which is a vital to deciding healthy choice and can increase knowledge of lactating mothers about the importance of nutrition and diet to uses different varieties of food groups

.The result of this study implied that lactating mothers dietary diversity was undesirable. Mothers who had low dietary diversity were less likely to gain micronutrient than who had high dietary diversity. In addition to that, mothers who do not have good knowledge about advantage of nutrition they can't decide their health choices to improve diversified diets, and, who can not practice home gardening the chance of diet access to improve DD is less.

As a result, there is a need for diet-centered nutrition counseling and informing its benefits including practicing home gardening as well as focusing with other identified associated factor of lactating mothers necessary to improving dietary diversity and maternal nutrition.

6.1. Strength and Limitation

The strength of the study was the use adequate sample and community based cross sectional study using simple random sampling to improve representative sampling and the participation rate of the respondents were high

However, the limitation of the study were there might be recall bias due to the data was collected by interviewer self administered questionnaire of the mothers about 24hr of recall dietary diversity assessment, Moreover, there is difficult to measure food composition and dish due to different ways of traditional food preparation.

Chapter Seven: Conclusion and Recommendation.

7.1. Conclusion

The current study finding showed that, the proportion of nearly two-third (65.3%) low dietary diversity among lactating mothers in Angacha district was high. However, the diets of respondents were noted to be predominantly starchy staple and green leafy vegetables. among the various food items the consumption of micronutrient rich seeds and nuts including protein rich food were the most difficult diet be assessed by lactating mothers. The study also revealed that counseling and education about nutrition, Husband support, and Illness were significant associated factors with study.

Therefore, needs **attention** from all relevant stakeholders prioritizing, planning, and designing dietary diversity intervention program and strengthen through community based nutrition education program on food based diversification including focusing all the associated factors.

7.2. Recommendation of the study.

The results have demonstrated that factors such as, nutrition education, Practicing home gardening, , source of drinking water which is unprotected well water, husband support, and Illness condition were important determinants of dietary diversity of lactating mothers.

7.2.1. Recommendation local government administration.

Based on this finding the administration should ensure new and revising existing rules and regulations on toward improving the living standards every house hold and strengthen the monitoring and evaluation of health utilization services. This support would play a significant role enhancing house hold dietary diversity of lactating mothers.

7.2.2. Recommendation for health care sectors and heath office.

The Health office would prepare tactical planning to improve dietary diversity of lactating women based on the finding and integrating with relevant stakeholders to launch health awareness mainly for lactating mothers to the improvement of early identification and timely treatment of illness.

Moreover, maternal and child nutrition department have play main role in educating lactating women on the importance of diversified diets, and providing nutritional education and training during lactation period. Further more, the health office should initiate and monitor existing community based nutrition program promoting dietary diversity especially lactating women.

7.2.3. Recommendation for Agricultural office.

They should plan way of improving living standards by using new agricultural technology and scale up training on some practical skills of how they can achieve high dietary diversity through methods of home gardening and through production of a variety of high yielding nutrition crops.

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Appendix/Annex:

Annex I: English Version information sheet Consent form

Questionnaire Identification Number-----

My name is Tesfaye Trikaso I am working as data collector in the research conducting by Wolde Yohannes Kibamo who is conducting this research for the partial fulfillment of his Master's Degree in Human Nutrition at Jimma University. we would like your honest opinion participating to the questions especially what you had experienced in the health institutions.

Name of advisors: Mrs Abonesh Taye

Dr Alemayhu Argaw

Name of Organization: Jimma University Faculty of Public Health and Department of Nutrition and Dietetics.

Introduction: In formation sheet and Consent form is prepared for data collectors who Are in health center and Volunteer to participating in research project questionnaire Cross-sectional study were used to assess Dietary Diversity and associated factors

Purpose: I am hopeful that this research will benefit all research participants all community, all study target groups .

Risk/Discomfort: By participating this research Project you are feel that it has same Discomfort especially in spending time. we hope you will Participate in the study

For the sake of benefit of the research result. I am sure there is no risk in Participating

In this research Project .you will be provided incentive or payment to take part in this

Project. Confidentiality: The Information collect for this research project will be kept

Confidential and information collected by this study will be stored in a file.

Principal Investigator: W/yohannes kibamo Tle;0934123279

Email: woldeyohanneskibamo@gmail.com

Annex II: Consent Form

I understand all conditions stated above. I have understood that participation in this study is entering Voluntarily .I have been told that my answer to the question will not

Be give any one else .There fore, I am ready and willing to participate in this study’

If , respondent does not agree to be interviewed thanks her and go to the next

Respondent. If, respondent say yes continue.

Will checked by: Supervisor: Name----- signature-----Date----/----E.C

Time Interviewed Started: Hour----- Questionnaire no-----

Name of Interviewer-----Date-----/ec.

Signature-----

To assess dietary diversity and associated factors among lactating mothers’ in Angacha district; durame Zone Southern Ethiopia, 2022 Good morning/ afternoon dear participant! My name is W/Yohannes kibamo. I am a graduate student of Jimma University, College of Health institution. I am conducting a research studies for my master’s degree of Science in Human Nutrition studies at Jimma University. The interview will take about 40 minutes. I kindly request you to lend me your attention to explain you or tell truth about the study, being selected as the study participant. Name of participant: Kebele/village _____ Name of Data Collector: Signature Date_____ Name of Supervisor: Signature Date _____

Annex IV: Questionnaire

Part I: Socio demographic questionnaire

Date of interview: DD/MM/YYYY

Date of birth : DD/MM/ YYYY

Identification Number{ID NO}-----

Si No	Variables	Category	Skip
Q1	How old are you ?	1.15--25 2..26-35 3.36-49	
Q2	Sex	1.Male 2..Femal	
Q3	What is your Residence ?	1.Rural 2. urban	
Q4	What is your current marital status ?	1.Marrid 2.unmarrid 3.Divorsed	

		4.Widowed	
Q5	IF not married with whom do you live	1.alone 2.with parents 3.with relatives 4.other(specify)	
Q6	Which Religion do you follow ?	1.Muslim 2. catholic 3.Protestan 4.Orthodox 5.Other	
Q7	Which ethnicity do you belong ?	1Oromo 2,Amhara .3. gurage 4.Other	

Q8	Current educational Status of mother ?	1.Not learned 2. Primary 3.Secondary 4.Tertiary	
Q9	Current education status of spouses	1 .Not learned 2. primary 3. Secondary 4. Tertiary	
Q10	current occupation of mother ?	1.Hause hold wife 2 Farmer 3.Civle Servants 4.other	
Q11	Current occupation of husband ?	Employer 2.marchant 3. Farmer 4.laborer	
Q12	Are you Employees ?	1.yes 2.no	
Q13	Employment of husband Are you employees	1.yes 2.no	
Q14	Are you practicing Gardening	1.yes	

		2.no	
Q15	How many numbers of families do you have	1.<=3 2.4—5 3.6-7 4.>=8	
Q16	Who is house hold head	1.Male 2.Femal	
Q17	Have you access to Home gardening	1.Yes 2.no	
Q18	Have you access to home garden	1.Yes 2.no	
Q19	Have you access to farm land	1.Yes 2.no	
Q20	Do you exchange food from market	1Yes 2.no	
	What is your source of food	1.own production 2.purchasing 3.Food aid 4.other	
Q21	What type of transport use to go to market	1.foot 2.bus	

		3.care 4.other	
Qu22	Do you have a children	1.yes 2.no If no go to Q12	

Part II: socio economic and Dietary related Questionnaire.			
Q23	What is the main source of water	1.Privet Tap 2.public Tap 3.well 4.Sprin 5 .Other (Specify)	
Q24	Do you know to add any thing in drinking water	1.yes 2.no	
Q25	If yes, what do you add	1.water agar 2.boil 3.filter 4.Other Specify(99)	
26	Is water available thought out the year	1.yes 2.no	
27	If no, what do you do when the	1.Buy from urban	

	water sources dries up	2.move a long distance 3 Other Specify		
Q28	Where do you dispose of your wast	1.Composit pit 2.Dump 303.buren 4. everywhere outside		
Q29	What is the main type of fuel that is usually used for cooking in your household	1.Fier wood 2.dry leaves 3.charchol 4.paraffin		
Q30	What is the main source of light in your house hold	1..Kerosen lump 2.Solar 3.Fier 4.Other specify		
Qu31	Weight	##.##		
Q32	Height	###.##		
Q33	How many children do you have	1.<4 2.>4		
Q34	How much income do you get F Monthly ETB	1.<2000birr 2.2000-4000birr 3.>4000birr		

Q35	Are go a whole day and night with out eating any thing	1.yes 2.no	
Q36	Are you skipping meal	1.yes 2.no	
Q37	Have you received nutrition education and counseling	1.yes 2..no	
	If yes, from where did you get training	1.Health worker 2.Health volunteer 3.Media 4,Other	
Q38	Have you consume different varieties of food group	1.yes 2.no	

Q39	Have you consume two additional food /day	1.yes 2.no	
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	If no what is the reason	1.lack money 2.lack knowledge about nutrition 3.niglignce Other (specify)	
Q40	Have you able to eat preferred food	1.yes 2..no	
Q41	How many times do you eat your meal /day(Eating frequency}	1.Two /day 2.Three/day 3>Three meal/day	
Q42	Husband support	1.yes 2.no	

	Part Three: Health and Illness characteristics Questionnaire		
	How much time do you visit ANC during last pregnancy	1.One time 2. two time 3. Three time 4 .Four time	
Q44	Have you ever been vaccinated	1.yes 2.no	
Q45	What type of vaccination do you get	1.TTP 2,ROTA 3.Othe	
Q46	Gravidity	1.Primigravida 2.Multigravida	
Q47	How many children give birth	1.<4 2.>4	
Q48	Are you practiced exclusive breast feeding from 0-6 month	1.yes 2.no	
Q49	All your children are vaccinated	1.yes 2.no	
Q50	Are you started Complementary feeding at six month	1.yes 2.no	

Q51	Are you follow up PNC	1.Yes 2.No	
Q52	Place of delivery	1.Health Center 2.Home 3.Hospital	
Q53	Age of current Breast feeding child in month	1. <6 month 2 .6—11month 3. 11—23month	
Q54	Are you use F/P	1.yes 2.no	
Q55	If your answer yes which method do you used	1.Implant 2.Nor plant 3.IUCD 4.Depo	
Q56	How much distance from your home	1.<2 km 2.>2km	
Q57	Are you use Iodine daily	1.yes 2.no	
Q58	Do you have latrine	1.yes 2.no	If yes go to q38

Q59	Are you change meal during lactation period	1.yes 2.no	
Q60	What is your Source of water	1.Tape water 2.well water 3.Pump water	
Q.61	Have you insecticide net	1.yes 2.no	
Q.62	Are you Consuming Additional Meal during lactation	1.yes 2.no	
Q.63	Have you ever any recurrent disease in your family last week	1.yes 2.no	If yes go to Q66
Q.64	What type of latrine	1,communal 2.pite 3.other	
Q.65	All your family using latrine appropriately	1.yes 2.no	
Q.66	What type of Disease were in your family	1.pneumonia 2.URT infection 3. malaria 4.other	
Q.67	Have you ever seen diarrhea	1.yes	If ye go to Q69

	diseases	2.no	
Q.68	Are you keeping your environmental hygiene appropriately	1.yes 2.no	
Q.69	What type of Treatment given Qu66	1.Not any 2.ORS 3.other drug	

Now I'd like to ask you to describe everything that you ate or drank yesterday during the day or night, whether you ate it at home or anywhere else. Please include all foods and drinks, any snacks or small meals, as well as any main meals. Remember to include all foods you may have eaten while preparing meals or preparing food for others. Please also include food you ate even if it was eaten elsewhere, away from your home. Let's start with the first food or drink consumed day and night. The

Part five dietary diversity consumption questionnaire among LW with in 24hr recall.

	Food Groups	Food item commonly consumed	Response, 1=Yes 0=No
Q71	Are you ate Staple with this 24hors	Corn/maize, rice wheat, sorghum ,millet, potatoes, pasta plantations any other grains or(food made from bread, porridge, or other grain products + insert Local foods)	
Q72	All dark green leafy vegetables	Dark green leafy vegetables, includes cabbage, cassava leaves, pumpikn leaves .tikle gomen, + locally available Vitamin A rich leaves,	
Q73	All VietA rich fruit and Vegetables	Pumpkin, Carrot, ripe mango, rip papaya,	

		passion fruit, rip banana, squash, sweet potato, and other Locally available Vitamin A rich vegetables and frits eg paper,	
Q74	All legums,nuts and seeds	Dried beans ,dried peas, lentils ,Soy beans. peanuts, butter, sesame, sunflower,	
Q75	All Meat and fish	Red meat, processed meat ,organ meats poultry, fresh and dried fish, sea foods,n	
Q76	All Egg	Eggs from chicken ,ducks ,or Other any Egg	
Q77	All diary products	Milk, cheese, yogurt	
Q78	Other Fruits and vegetables	Butter, palm oil, lard and other edible oil	
Q79	Other vitamin A rich Vegetables and fruits	Includes fresh peas, snow peas, cucumber, grean beans, (Tomato ,Onion, Papers)+,Other Locally available vegetables. wild fruits	
Q80	Level of Women Dietary Diversity		

Thank you very much for your response!

በጅማ ልማት ዩኒቨርሲቲ ስርዓተ-ምግብ አጠቃቀም ስርዓት በሁለተኛ ድግር ለመመረቅ ከ15-49 ዓ/ም ያሉትን የምያጠቡ እናቶችን በጡት አጥብነት ወቅት የሚያስፈልጉ የተለያዩ ምግብ ዓይነቶችን አጠቃቀም በተመለከተ ምርምርና ጥናት ለማድረግ ስለሆኑ በ24 ሰዓት ውስጥ ሚትና ማታ የበሉትንና የጠጡትን ቤት ሆኔ ውጭ የበሉትን የጠጡት እንድንገኛ በትህቲነ እጠይቃለሁ።

ከእንልዝኛ ወደ አማርኛ የተተረጎመ ስርዓተ ምግብ አጠቃቀም መረጃ መሰብሰብያ ጥያቄ ጥያቄ ጠያቂ ስም----- ፊርማ----- ቀን-----

ጥያቄ የተጠየቀበት ቀን----- ወር----- ዓ/ም-----

የተወለድኸበት ቀን----- ወር-----ዓ/ም----- ፊርማ-----

ቤት ቁጥር-----

ቀበሌ ስም-----

ኃጥ ስም-----

ክፍል አንድ፡ ስኔ ህዝብና እኮኖሚ ጥያቄ

ተ.ቁ	ጥያቄ	መልስና ኮድ	ዝለል	ምርመራ
	IDNU (መለያ ቁጥር)-----			
እድሜሽ	ስንት ናዉ	----- አለዉቅም (99)		
3	የአሁኑ መኖርያ ቦታ?	1. ገጠር 2. ከተማ		

4	አሁን ያለዉ ጋብቻ ሁኔታ ?	<ol style="list-style-type: none"> 1. ያገባ 2. ያላገባ 3. የፈታ 4. ጋለሞታ 	
5	አሁን የምትከተይዉ ሀይማኖት ምንድነዉ	<ol style="list-style-type: none"> 1. ሙስሊም 3. ካቶልክ 4. ፕሮተስታንት 5. ኦርቶዶክስ 	
6	ብሄርሽ ምንድነዉ	<ol style="list-style-type: none"> 1. ኦሮሞ 2. ካምባታ 3. አማራ 4. ጉራጌ 5. ሌላ 	

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7		<p>የባል ትምህርት ሁኔታ</p> <p>የምስት ትምህርት ሁኔታ</p>	<ol style="list-style-type: none"> 1. ያልተማሪ 2. 1ኛ ሳይክል 3. 2ተኛ ሳይክል 4. ሰስተኛ ደረጃ 	
8		የምስት ትምህርት ሁኔታ	<ol style="list-style-type: none"> 1. ያልተማሪ 2. 1ኛ ሳይከል 3. ሁለተኛ ሳይክል 4. 3ተኛ ዳጃ 	
9		አሁን ያለው የባል ምድ ሁኔታ	<ol style="list-style-type: none"> 1. ማግስት ሰራተኛ 2. ነጋዴ 3. ገበሬ 4. የቀን ሰራተኛ 	
10		አሁን ያለው የምስት ምድ ሁኔታ	<ol style="list-style-type: none"> 1. የቤት እማኔት 2. ገበሬ 3. ማግስት ሰራተኛ 	
11		የጎሮ አታክልት ታፈራለሽ ወይ	<ol style="list-style-type: none"> 1. አዎ 2. አይደለም 	

12	የበተሰብ አባላት ብዛት ስንት ናዉ	<ol style="list-style-type: none"> 1. ከሶስት በታች 2. ከአራት እስከ አምስት 3. ከስድስት እስከ ሳባት 	
		4. ከስምንት በላይ	
13	የጎሮ አታክልት አለሽ ወይ	<ol style="list-style-type: none"> 1. አዎ 2. የለም 	
14	ለጎሮ አታክልት ለሜራት ምቹ ሁኔታ አለ ወይ	<ol style="list-style-type: none"> 1. አዎ 2. የለም 	
15	አታክልት ሜርያ ሜት አለ ወይ	<ol style="list-style-type: none"> 1. አዎ 2. የለም 	
16	የበተሰብ ሃላፊነት በዋነኛነት ያለዉለማ ናዉ	<ol style="list-style-type: none"> 1. ባል 2. ምስት 	
17	የምትበሉት ምግብ ምንጭ ከየት ናዉ	<ol style="list-style-type: none"> 1. በሚት ዘርተን 2. ሻምተን 3. ከረጅ ድርጅት 	
18	የምግብ ምግብ ከገበያ ገዝታችሁ ትጠቀማላችሁ ወይ	<ol style="list-style-type: none"> 1. አዎ 2. አይደለም 	
19	ገበያ ስትሄዱ ምን አይነት ማዳገፍ ናዉ የምትጠቀሙት	<ol style="list-style-type: none"> 1. በእግር 2. በአውቶብስ 	

		3. በታክስ 4. በሌላ	
20	ልጆች አሉሽ ወይ	1. አዎ 2. የሉም	አዎ ከሆኑ 23 ቁጥር
21	ክብደት	-----	
22	ቁመት	-----	
23	ስንት ልጆች አሉሽ	1. <4 2. >4	
24	የበተሴብ ወርሐዊ ገብ አችሁ ስንት ይሆናል: :	1. ከ2000ብር በታች 2. ከ2000— 4000ብር 3. ከ4000ብር በላይ	

ክፍል ሁለት፡ ወሃ ፣ እና የአካባቢ ንጽህና በተመለከተ

25	ወሃ የምትጠቀሙት ከየት ናዉ	<ol style="list-style-type: none"> 1. ከግለሰብ 2. ከህዝብ ቧምቧ 3. ከጉድጓድ 4. ከምንጭ 		
26	ንጹህ ወሃ ለማጠቀም ምን እደማድረግ ታወቃለችሁ	<ol style="list-style-type: none"> 1. አዎ 2. አይደለም 		
27	አዎ ከሆኔ ምድነ ዉ የምታደርጉት	<ol style="list-style-type: none"> 1. ሜላት 2. ማጠራት 3. ሜላትና ማጠራት 4. እንድረጋ ማድረግ 		
28	የምትጠጡበት ወሃ ከዓሙት እስከ ዓሙት ይዘልቃል ወይ	<ol style="list-style-type: none"> 1.አዎ 2.አይደለም 		
29	አይደለም ከሆኔ ምን ድነ ዉ የምታደርጉት	<ol style="list-style-type: none"> 1. ከግል ገዝተን እንጠቀማለን 2. ከከተማ ገዝተን እንጠቀማለን 3. ረጅም ጉዞ ተጉዜን ፈልገን እንጠቀማለን፡፡ 		
30	ደረቅ ቆሻሻን የምታስዎግዱበት የት ናዉ	<ol style="list-style-type: none"> 1. አጠራቅሙን እናስወግዳለን፡፡ 2. በየቦታ እንጥላለን 3. ሰብስበን እናቃጥላለን 		
31	ምንብ ለማበሰል የሚትጠቀሙት ምድ ናዉ	<ol style="list-style-type: none"> 1. እንጭት 2. ደረቅ ቅጠላቅጠል 		

		3. ከሰሌ 4. ቡታጋዝ		
32	ማበራት የምታገኙበት ምንጭ ከየት ናዉ	1. ከጋዝ 2. ሰላር 3. እሳት 4. ሌላ ከሌ ጥቀሱ		
33	ፈሳሽ ቆሻሻን የምታስዎግዱበት የት ናዉ	1. በጉድጓድ 2. ወደ ወጭ ሜሰስ 3. በይ ወስጥ ሜሰስ		

34	ምግብ የምገለበትን ሰዓት አሳልፈሽ ታወቅያለሽ ወይ	1. አዎ 2. አይደለም		
35	ስለ አልሚ ምግብ አጠቃቂም ትምህርት ወይም ስልጠና	1. አዎ 2. አይደለም		

	ተሰጥቶሽ ይታወቃል ወይ			
36	አዎ ከሆኔ ስልጠና ወይም ትምህርት የተሰጠሽ ማን ናዉ	1. ጤ ጣብያ 2. በጎ ፈቃደኛ 3. ከምድያ		
37	የተለያዩ ምግብ ዓይነት ዘወትር እየተጠቀምሽ ናዉ ወይ	1.አዎ 2.አይደለም		
38	አይደለም ካሆኔ ምክንያቱ ምንድነዉ	1. ከገንዘብ እጥረት 2. ፊላጎት ያለመኖር 3. ጥቅመን ካለመወቅ የተነሳ		
39	በቀን ሁለት ግዜ ተጨማሪ ምግብ ትጠቀምዎለሽ ወይ	1. አዎ 2. አይደለም		
40	ምግብ መርጠሽ ትጠቀምዎለሽ ወይ	1. አዎ 2. አይደለም		
41	ምግብ በቀን ስንት ግዜ ትበያለሽ	1. ሁለት ግዜ 2. ሶስት ግዜ 3. አራት ግዜ		
42	ባለበትሽ ተገብዉን ድጋፊና እንክብካቤ ያደርግልሻል ወይ 1. አዎ 2. አይደለም			

ክፍል ሶስት፡ ጠፍ በተማላከተ

44	የቅድሜ ወልድ ክትትል ስንት ግዜ አድርጌሻል	1.አንድ ግዜ 2.ከሁለት እስከ ሶስት ግዜ 3.አራት ግዜና በላይ		
45	አሁን የወለድሽዉ ስንተኛሽ ናዉ	1. የመጀመሪያ 2. ሁለተኛ 3..ከሁለት በላይ		
46	ስንት ልጆች ዎልደሻል	1. አራትና ከአርት በታች 2.ከአርትና ከአራት በላይ		
47	እስከ ስድስት ወር ድረስ ያለ ምንም ተጨማሪ ጠት ብቻ አጥብተሻል ወይ	1. አዎ 2. አይደለም		
48	ልጆቸሽ ሁሉንም ክትባት ወስዶአሉ ወይ	1. አዎ 2. አይደለም		
49	ተጨማሪ ምንብ ስድስት ወር እንደሞላ ጀምረሻል ዎይ	1. አዎ 2. አይደለም		
50	አይደለም ከሆኔ ምክንያቱ ምንድ ናዉ	1. ከገንዘብ ማነስ 2. ግንዛቤ ማነስ 3. እኮኖሚ ማነስ		

		4. ሌላ ምንጭ ካሌ		
51	ድህረ ምልድ ክትትል አድርገሻል ወይ	1. አዎ 2. አይደለም		
52	የወለድሽበት ቦታ ጭት ነበር	1. ጠፍ ጠቢያ 2. ቤት 3. ሆስፕታል		
53	ጠቅ እስከ ስንት ወር ታጠብያለሽ	1. ስድስትና በታች 2. ከስድስት እስከ አስራ አንድ ወር 3. ከአስራ አንድ ወር እስከ ሃያ ሶስት ወር		
54	በተሰብ ምጣኔ ትጠቀሙለሽ ወይ	1. አዎ 2. አይደለም		
55	የሙትጠቀሚ ካሆኔ ምክንያቱ ምንድን ነው	1. ስለ ምደራ 2. ስለ ማይስ ማጥፋት 3. ሳዉአትጠቀሚ ስላለኝ 4. ስለ ምያ ማኝ		
56	አዎ ካሆኔ የትኛውን ዘዴ ናዉ የምትጠቀምዉ	1. እምጥላኖል 2. ኖር ፕላንት 3. አይ ዩ ሲ ዲ 4. ድፖ		

57	ቤተሰብ ምጣኔ ከየት ናዉ የምትጠቀሙ	1. ከግል ተቋም 2. ከጠፍ ጣቢያ 3. ከሆስፕታል 4. ከሌላ ካለ ጥቀሽ		
58	ከቤትሽ እስከ ተቋም ያለዉ ርቀት ምን ያህል ክሎ ሜትር ይሆናል: :	1. 2 ክሎ ሜትር 2. 3 ክሎ ሜትር 3. ከ3 ክሎ ሜትር በላይ		
59	አዮድን ጫፍ ትጠቀሙዎለሽ ወይ	1. አዎ 2. አይደለም		
ክፊል አራት: ጠፍ ና ጠፍ ሁኔታ በተማላከተ				
60	ሽንት ቤት አላችሁ ወይ	1. አዎ 2. አይደለም		
61	ጠቅ አጥብነት ወቅት አመጋገብ ስርዓት ቀይረሽ ታወቅዎለሽ ወይ	1. አዎ 2. አይደለም		
62	ዉሃ ከየት ናዉ የምትጠቀሙት	1. ከቧምቧ 2. ከጉድጓድ		
63	የወባ ማላከያ አጎበረ አላችሁ ወይ	1. አለ 2. የለም		
64	ባለፈዉ ሳምንት በበተሴብ ዉስጥ ሳዉ ታሞ ነበር ወይ	1. አዎ 2. አይደለም		
65	መጻፊያ ቤት የምትጠቀሙት የት ናዉ	1. የጋራ 2. የግል አፊ ጠባብ		
66	መጻፊያ ቤትን በተሰባኝ በአግባቡ ይጠቀማሉ ወይ	1. አዎ 2. አይደለም		

67	በጥያቄ ቁጥር 64 አዎ ካሆኑ በቤተሰብ የተከሰተው የበሽታ አይነት ምንድናዊ	1. ሳንባ ምች 2. የላይኛው ሙንጎጎ አካልበሽታ 3. ወባ 4. ሌላ		
68	በለፈው ሳምንት በቤተሰብ ተቅማጥ በሽታ ተከስቶአል ወይ	1. አዎ 2. አይደለም		
69	የአከባብ ንፅህናን በአግባቡ ትጠብቃለችሁ ወይ	1. አዎ 2. አይደለም		
70	ጥያቄ ቁጥር 68 አዎ ካሆኑ የተኛውን ሙሉ ማህተም ተጠቅመዋል	1. ምንም 2. እንግልዝ ጫፍ 3. ሌላ ሙሉ ማህተም ጥቀሱ		

ክፊል አምስት: የሚከተሉት ጥያቄዎች በዘጠኝ ምግብ ግሩፕ የተካተቱ የተለያዩ ዓይነት ምግብ አጠቃቀም ጥያቄዎች ናቸው፡ ስለዚህ ትክክለኛ መልስ እንድትመልሱልኝ በትህትና እጠይቃለሁ፡

	ዘጠኝ ምግብ ግሩፖች	የሚከተቱ የምግብ ዓይነቶች ዝርዝር	ኮድ አዎ ካሆኑ ፡ 1 አይደለም ካሆኑ ፡ 2	
71	ሃይል ሰጭ ምግብ ክፍል	ነጭ ድንች፣ የእንሰት ምግብቦች፣ ዳቦ ፣ ጉዳሬ፣ ስኳር ድንች፣ የስር ተክል፣ ቅጣ፣ ገንጭ እንጆራ፣ ፓስታ ፣ ቆሎ፣		

		ስንዴ፣ ገብስ ፣ ማሹላ እና ሩዝ		
72	ለጉምህና ለውዝ ምግብ ክፍል	ባቄላ ፣ አተር ፣ ኑግ ፣ ሽምጉራ፣		
73	የእንስሳት ተዋዲጾ ምግብ ክፍል	አይብ፣ እርጎ ፣ እና ወተት		
74	የስጋና ዓሳ ምግብ ክፍል	የባሬ ስጋ ፣ የበግ ስጋ ፣ የፍጮል ስጋ ፣ ጉበት ፣ ኩላልት ፣ የዶሮ ስጋ ፣ ዓሳ እና ሌሎች የመሳሰሉት		
75	የእንቁላል ዓይነቶች	የዶሮ እንቁላል ፣ የዳክዬ እንቁላል እና ሌሎች የመሳሰሉት		
76	የአሩንጓዴ አታክልት ክፍል	ጎመ፣ ሰላጣ/ ቆስጣዱባ		
77	በሽይታሚኔ ኤ የበለጸጉ አሩንጓዴ ቅጠላ ቅጠል ምግብ ክፍል	ጎመ፣ ሰላጣ		
78	ሌሎች ሽይታሚኔ አታክልትና ፍራፍሬ ምግብ ክፍል	ካሮት ፣ ስኳር ድንች ፣ ቃርያ ፣ ሎሚ፣ አቦካዶ ፣ መንጎ ፣ ፓፓያ ፣ መዝ ፣ እና ሌሎች ፍራፍሬዎች ጭማቂ		
79	የተለያዩ ፍራፍሬዎች እና አታክልቶች	ቲማቲሚ፣ የእንጆሪ ጭማቂ እና ሌሎች		

DECLARATION

I declare that this thesis is my original work and has not been presented for a degree or certification in any other Universities, institutions and that all sources of material used for the thesis have been dulyacknowledged.

W/yohannes kibamo August, 2022 Jimma Ethiopia.

This is Proposal for *determinants of dietary diversity and associated factors among Lactating*

Mothers in Angacha woreda Durame Zone, Southern Ethiopia Prepared by W/yohannes Kibamo and Submitted to College of Health Institute Faculty of public Health, Jimma University in Partial Fulfillment of the Requirements for the Degree of Masters of Science in Human Nutrition .

w/ Yohannes kibamo

Date -----

S Signature-----

Submission Approved by:

Advisor : Mrs Abonesh Taye

Date-----

Signature-----

Dr Alemayh Arega -----

signatute-----

