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# OVERNUTRITION AND ASSOCIATED FACTORS AMONG LACTATING MOTHERS AT BAHIRDAR CITY; COMMUNITY BASED CROSS-SECTIONAL STUDY

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**BAHIR DAR UNIVERSITY**

**COLLEGE OF MEDICINE AND HEALTH SCIENCES, SCHOOL OF  
PUBLIC HEALTH DEPARTMENT OF NUTRITION AND  
DIETETICS**

**OVERNUTRITION AND ASSOCIATED FACTORS AMONG  
LACTATING MOTHERS AT BAHIR DAR CITY; COMMUNITY  
BASED CROSS-SECTIONAL STUDY**

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**A THESIS RESEARCH SUBMITTED TO THE DEPARTMENT OF  
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## **Abstract**

**Background:** Over nutrition is the abnormal or excessive accumulation of fat. Globally over nutrition were remaining high and increasing among lactating mothers. Even if nutritional strategies and plan implemented by Ethiopian government for attempting to reduce the double burden of malnutrition, to the best of my knowledge, there is limited study on the magnitude and factors of over nutrition among lactating mothers.

**Objective:** To assess over nutrition and its associated factors among lactating mothers who have children aged between 6 weeks to 24 months in Bahir dar City, North West Ethiopia

**Method:** A community based cross-sectional study was employed on systematically selected 606 lactating mothers. Interviewer administered structure questionnaire was used to collect the required data. Body mass index were used to assess the over nutrition of lactating mothers. Data were edited, coded, and entered to EPI data version 3.1 and then exported to Statistical Package for Social Science version 23 for further analysis. Bivariable logistic regression analysis was executed to see the association between independent and outcome variables with  $p < 0.2$ . Multi variable logistic regression analysis identified based on  $p < 0.05$ .

**Result;** The prevalence of over nutrition was 13.9%. Monthly income 5000 -9999 and 10000-19999(2.99, 1.28- 6.99 and 3.31, 1.63-6.72) respectively, physically inactive (3.56, 2.03-6.25), duration of breast feeding <6 month (2.98,1.43-6.23) and food secure (5.29, 2.94-9.53) were found to be risk factors for increase over nutrition of lactating mothers.

**Conclusion and recommendation:** magnitude of over nutrition is greater than the national EDHS, 2016 report. Therefore, intervention like improving physical activity level of lactating mothers should be included in the postnatal care.

## **Abbreviations and Acronyms**

BMI	Body Mass Index
EDHS	Ethiopian Demographic and Health Survey
PAS	Proportional Allocation to Size
SPSS	Statistical Package for Social Science
UNICEF	United Nations Children's Fund
WHO	World Health Organization

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# 1. Introduction

## 1.1. Background

According to World Health Organization (WHO), over nutrition is the abnormal or excessive accumulation of fat. It is above the normal nutritional level which is described by Body Mass Index (BMI) greater than or equal to 25 kg/m<sup>2</sup> including both overweight 25–29.9kg/m<sup>2</sup> and obese at  $\geq 30$ kg/m<sup>2</sup>(1). Similarly, over nutrition is a result of complex interactions between food consumption and the overall status of health. It is an indication of feeding pattern with access of unbalanced diet(2). It is one component of dual burden of malnutrition. It is indicated by existence of high levels under nutrition declining and accompanied by an additional apprehension rising rates of over nutrition. During the period of rapid economic growth, it is not surprisingly over nutrition gaining attention among academics and media. Over nutrition is the major risk of non-communicable disease or chronic disease. Now a day over nutrition is a part of triple burden of mal nutrition in addition to infectious diseases and under nutrition(3, 4). For lactating mothers the normal nutritional status is a vital area of health because it is a signal for the whole happiness of life. Mothers who are feed breast milk to their child exclusive use an approximate daily energy expenditure of 2100 kJ or energy need increase at least by 550 Kcal during lactation(5, 6).

Over nutrition is above the normal recommended for lactating mothers supposed to increase dietary energy intake for maintain breast milk creation, improving maternal recovery after childbirth and avert maternal malnutrition. Balanced dietary intake during breastfeeding is significant for mothers and infants to maintain most favorable health by rearrange mother's metabolism and long term changed glucose homeostasis. Lactation is important for over nourished mothers by reducing postpartum weight gain for preventing over nutrition related consequences (7, 8). In Ethiopia estimated death rate of 589.4 per 100,000 populations by non-communicable diseases related with over nutrition. It estimated to account for 30% of total deaths (3, 9). Additionally most non communicable disease and death related to chronic diseases of lactating mothers are related with over nutrition by does not control the modified risk factors including unhealthy diet, tobacco use & smoke exposure, insufficient physical activity and excessive alcohol use. The double burden of malnutrition experienced with rising up of maternal over nutrition related with sedentary lifestyle (3, 4).

## **1.2. Statement of the problems**

Globally, over nutrition has been remained to be a challenge to decrease the burden of maternal malnutrition. predisposed to over nutrition among lactating mothers still increased worldwide (10, 11).

In Asian countries similar trends were happened, over nutrition among rural and urban lactating mothers in different areas of Asia were between 19% - 37.2%(12).Results of demographic and health surveys of African countries indicate the prevalence and time trends of over nutrition among urban lactating mothers were rapidly increased in the past two decades. Most of those countries had an over nutrition prevalence above 20%. Specifically Egypt has the highest prevalence of over nutrition 83%(13, 14).

According to 2016 Ethiopian Demographic Health Survey (EDHS) Over nutrition of women including lactating mothers increase by estimated of three fold in the last two decade and a rising challenge of over nutrition particularly in urban area, by those EDHS recommend to design study targeted for over nutrition reduction program emphasis to mothers living in big city (15). Study in Addis Ababa, Ethiopia indicated over nutrition of women increase by 43.3%. in this town the mortality rate analysis of double burden in chronic disease was the leading cause of death by over nutrition mainly related with by increase the time of more sedentary life and unhealthy high caloric food consumed by women (15, 16). In Ethiopia analysis of data from EDHS and other results indicate the prevalence of over nutrition among lactating mothers was between 8% to 18.9%18.9% (17-19) .

Chronic diseases like heart disease, hypertension, diabetes, cancer, stroke, major depression, risk of future obesity of child, decreased contraceptive effectiveness, cesarean section, menstrual disorders, infertility, miscarriage, adverse pregnancy outcomes and other non-communicable diseases are arrived by the consequences of over nutrition(20, 21).The major challenge for decreasing nutrition transition related with over nutrition was because of rising economic development, rapid urbanization, changes in food production and dietary pattern specifically highly processed diet. Chronic disease can lead to tremendous social and economic burdens due to costly medical expenses and job loss(22).

Several factors influence the occurrence of over nutrition of lactating mother's like socio-demographic , socio economic factors, obstetric and health related factors, dietary related factors and environmental factors (23, 24).

Different interventions were implemented including food pyramid guideline that was developed from the US Department of Agriculture (USDA) based on the principles of balance, variety and moderation of food. It gives more emphasis to vegetable and fruit than fat and oil. Lactating mothers nutrition were improving by implementing National Nutrition Program(NNP) focused particularly on nutrition education, but the existing stressed health-care system is further challenged by over nutrition and the current non communicable disease also the major challenging to decrease related with over nutrition(25, 26).

Even though, different interventions implemented, the prevalence and trends of over nutrition is increasing in Africa(13).Death by chronic disease of women's including lactating mothers by the consequence of over nutrition is increasing in Ethiopia(3).

According to the 2016(EDHS) over nutrition of women including lactating mothers has been increased in the last two decades. It indicates that the prevalence of over nutrition in the country as a whole, not specific to region accounts about 8.1% and higher particularly in urban area (17).

Since breast feeding is important protective factors for over nourished mother, evidence is still controversial, the underlying mechanisms were unclear(7).The problems of over nutrition were related by sedentary life and unhealthy high energy dense food consumption, so Bahir Dar, which is one of the urban town in Ethiopia may expose to this activities(19).

In this regard, there is no study on the magnitude and factors of over nutrition among lactating mother in the study area. Therefore this study is going to fill by assessing over nutrition and associated factors of lactating mothers in Bahir Dar City.

### **1.3. Significance of the study**

The finding of this study is provide information regarding the magnitude of over nutrition and associated factors among lactating mothers for Ministry of health, regional health bureau, policy makers and researchers. The result is relevant for future assessment, planning and give interventions to promote and maintain healthy nutritional status of lactating mothers.

In addition, the findings of this study is important for health care provider for give the appropriate counseling service to lactating mothers related with dietary feeding and breast feeding. This study makes participants to be familiar with the concept of over nutrition and give emphasis to proper diet after giving birth.

## **2. Literature Review**

### **2.1. Prevalence of over nutrition among lactating mothers.**

Globally the prevalence of over nutrition among women including lactating mothers were 38%(27).Studies result indicated in Europe and Brazil at 2015 the prevalence of over nutrition among lactating mothers were 16.91%, 64.9% respectively (28, 29). A study conducted in Bangladeshi the prevalence of over nutrition among lactating mothers were 8.4%(30).Cross sectional studies done at 2016 in China and Nepal the prevalence of over nutrition were 16.5%, 16.6 % respectively (25, 31).

The prevalence of over nutrition among lactating mothers from demographic and health surveys of Sub Saharan Africa countries indicated that, Egypt had the highest prevalence of over nutrition (83%). Followed by Ghana with an over nutrition of 52%.Niger and Rwanda were two other countries having over nutrition greater than 30%. The other like Kenya, Zimbabwe, Uganda, Benin, Zambia, Mali, Tanzania, Burkinafaso and Malawi had the prevalence of over nutrition between 26.8- 45%(13). The prevalence of over nutrition in Zambia and Bagdad among lactating mothers were 22% among urban, 14.8% among rural Zambia and 55.4% respectively (32, 33).

Across sectional study conducted in 2018 at Madagascar, 7% of lactating mothers were over nourished (34).A study conducted in 2016 of the Dschang Health District, West Region Cameroon among lactating mothers the prevalence of over nutrition were 73.1%(35).

Based on 2016 Ethiopian demographic and health survey the prevalence of over nutrition among women including lactating mothers were 8.1%(17). A community based cross-sectional study conducted in 2016 at Ambo district revealed that the prevalence of over nutrition among the lactating mothers were 10%(36). Based on cross sectional study done among lactating mothers in Northwest Ethiopia, Offa Woreda Wolayita Zone , SNNPRs, Ethiopia were 9.9%(37).A cross-sectional study conducted in 2019 at Arba Minch, Southern Ethiopia, the prevalence of over nutrition among lactating mothers were 18.8%(18).

## **2.2. Factors associated with over nutrition of lactating mother.**

### **2.2.1. Maternal Socio-economic and demographic factors**

Study conducted at Bangladesh and urban mothers of Ethiopia stated that age of mothers were significantly associated with over nutrition(14, 38).

A cross sectional study conducted in Brazil revealed that marital status were statistically associated with over nutrition of lactating mothers(28). In contrast to this result of US indicated there was no association between maternal over nutrition and marital status(39).

A cross sectional study conducted in Mexico, educational status was associated with over nutrition(40). In contrast to this study conducted in Belgium indicate there is no association between educational status and over nutrition (41).

Result of US indicated, there was no association between maternal over nutrition and race/ethnicity(39).

According to study conducted in Brazil as well as Ethiopia revealed that monthly income was statistically associated with over nutrition of lactating mothers(28, 42).

A data analysis of Ghana Demographic and Health Surveys (GDHS) indicated that lactating mothers who have higher children had significantly increased odds of being over nourished than those having lower child(43).

### **2.2.2. Obstetric and health related factors**

Results from Brazil indicated that greater number of children and inter-pregnancy interval were directly associated with over nutrition of lactating mothers(28). Study conducted in Australia indicated that caesarean sections mode of delivery was significantly associated with over nutrition of lactating mothers (44).

A study conducted in Mexico showed that doing physical activity was not associated with over nutrition(45). Results revealed that doing physical activity after delivery were directly associated with reduction of over nutrition (19, 28, 46).



### **2.2.3. Breast feeding and dietary related factor**

A result from Mazandaran University indicated an inverse relationship between high-diversity diet and over nutrition (46). Across sectional study conducted in Iran, it was observed that no significant association made between dietary diversity and over nutrition of lactating mothers (46, 47).

A study done at Texas Tech University in the United States food insecure was associated with over nutrition(48). A cohort study conducted in 2015 of California; USA stated that being food insecure was associated with over nutrition. Food insecure women experience more likely to retain additional weight (49). A cross sectional study conducted in 2017 in Niger showed that there was a significant association between food insecure and over nutrition of lactating mothers. Additionally, retrospective cohort study indicates in this country(Niger) the prevalence of over nutrition was greater in participants who reported food insecurity(50, 51). In contrast to those, a cross sectional study conducted in 2016 at Mexico revealed that being food secure was significantly associated with over nutrition of lactating mothers(40).

Studies conducted at Afro-American mothers, Brazil indicated that breast feeding duration had protective effect for mothers. Breast feed for short time is the predisposing factor for over nutrition than long time or lactating mothers who are feed their child for long time prevent over nutrition than breast feed for short time. Breastfeed duration was associated with over nutrition of lactating mother (5, 7, 8).

A cross sectional study conducted in 2015 at Iran indicated that family support of husband and other family members were not significantly associated with lactating mothers over nutrition(52). Similarly, a study conducted in Depok, Indonesia indicated no association noticed between husband support and over nutrition(53).

### **2.2.4. Environmental related factors**

A cross sectional study conducted at Addis Ababa stated improved water source and toilet facility were associated with over nutrition(15).

### 3. Conceptual framework on factors associated with over nutrition of lactating mothers

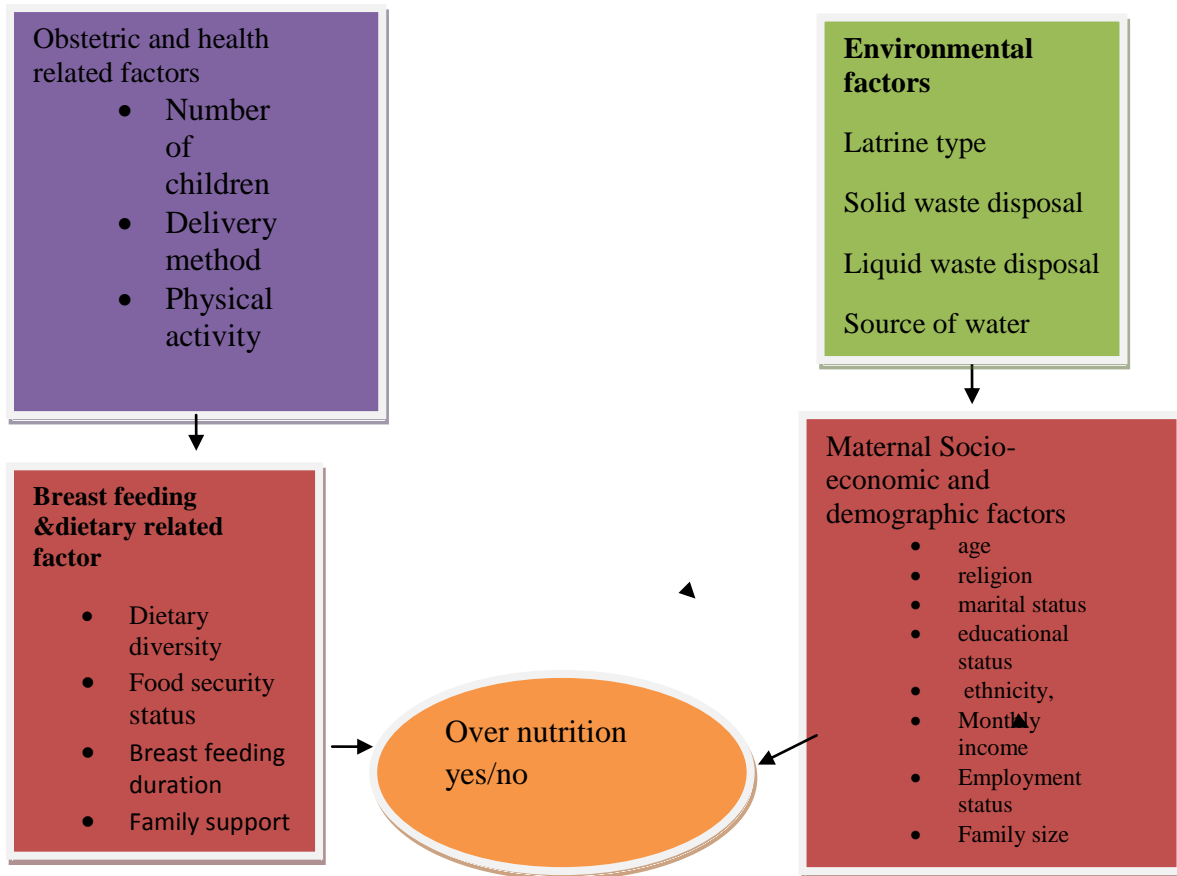


Figure 1. Conceptual framework on factors associated with over nutrition of lactating mothers in Bahir Dar city modified from different literatures, October –November, 2019. (N=598) (19, 42, 54).

## **4. Objectives**

### **4.1. General Objective**

To assess over nutrition and its associated factors among lactating mothers who have children aged between 6 weeks to 24 months in Bahir Dar City, North West Ethiopia.

### **4.2. Specific Objective**

1. To assess the prevalence of over nutrition of lactating mothers who have children aged between 6 weeks to 24 months in Bahir Dar City, North West Ethiopia.
2. To identify associated factors of over nutrition among lactating mothers who have children aged between 6 weeks to 24 months in Bahir dar City, North West Ethiopia.

## **5. Methods and Materials**

### **5.1. Study area and period**

The study was carried out in Bahir Dar City, Amhara Region, North West Ethiopia from October 1 to November 15, 2019. Bahir Dar is 564 kilometers far from Addis Ababa which is the capital city of Ethiopia. Based on Amhara Regional health report, there are 313,997 total populations in the city, of which there are 9250 lactating mothers with children, aged between 6 weeks to 24 months. It has 17 kebeles, ten governmental health centers, two NGO clinics, three governmental hospitals, ten health posts, three private hospitals, thirty four private medium clinic, and six private lower clinics.

### **5.2. Study design**

A community based cross sectional study was conducted.

### **5.3. Population**

#### **5.3.1. Source population**

The source population was all permanent residents lactating mothers who have child age between 6 weeks to 24 months in Bahir Dar city.

#### **5.3.2. Study population**

The population of the study was all permanent residents lactating mothers who have child age between 6 weeks to 24 months in selected kebeles of Bahir Dar City.

#### **5.3.4. Study sample**

Sampled lactating mothers who have child age between 6 weeks to 24 months and who live permanently in the Bahir Dar city.

### **5.4. Inclusion and exclusion criteria**

#### **5.4.1. Inclusion criteria**

Lactating mothers with children aged between 6 weeks to 24 months and permanent resident of the kebeles during data collection period.

#### **5.4.2. Exclusion criteria**

Lactating mothers with physical disability

### **5.5. Sample size determination and sampling procedure**

#### **5.5.1. Sample size determination**

To determine the sample size, the following formula was employed.

$$N = \frac{Z^2 \alpha/2 P(1-P)}{D^2}$$

D<sup>2</sup>

Where, N = Sample size

Z  $\alpha/2$  = Standard normal variable corresponding to the 95% confidence level = 1.96

P = Prevalence of over nutrition among lactating mothers in Arba Minch Zuria District, Southern Ethiopia which is 18.8% (18).

D = Margin error (precision) = 4%

The sample size estimated was 367 NRR = Non response rate (%) = 10%, with a design effect of 1.5. The final sample size was 606.

Table 1. Sample size determination for the second objective factors associated with over nutrition of lactating mothers in Bahir Dar city, October –November, 2019. (N=598)(42, 55).

	Factors	Assumptions						
		Odd Ratio	Power %	CI %	Proportion of over nutrition among exposed	Proportion of over nutrition among unexposed	Sample size	Design effect
1	Educational status of mother	3.36	80	95	35.3	64.7	239	1.5
2	Monthly income	2.88	80	95	75.7	24.3	239	1.5
3	Physical activity	4.09	80	95	20.2	79.8	327	1.5

### 5.5.2. Sampling technique

Multistage sampling was conducted among lactating mother in Bahir Dar city, 2019

### 5.5.3. Sampling procedure

From the 17 kebeles, 4 kebeles were selected randomly in the first stage. Then, Proportional Allocation to Size was employed to allocate the sample size for selected kebeles. Thus, lactating mothers were selected systematically in selected kebeles to collect the required data. Its graphical representation is presented under.

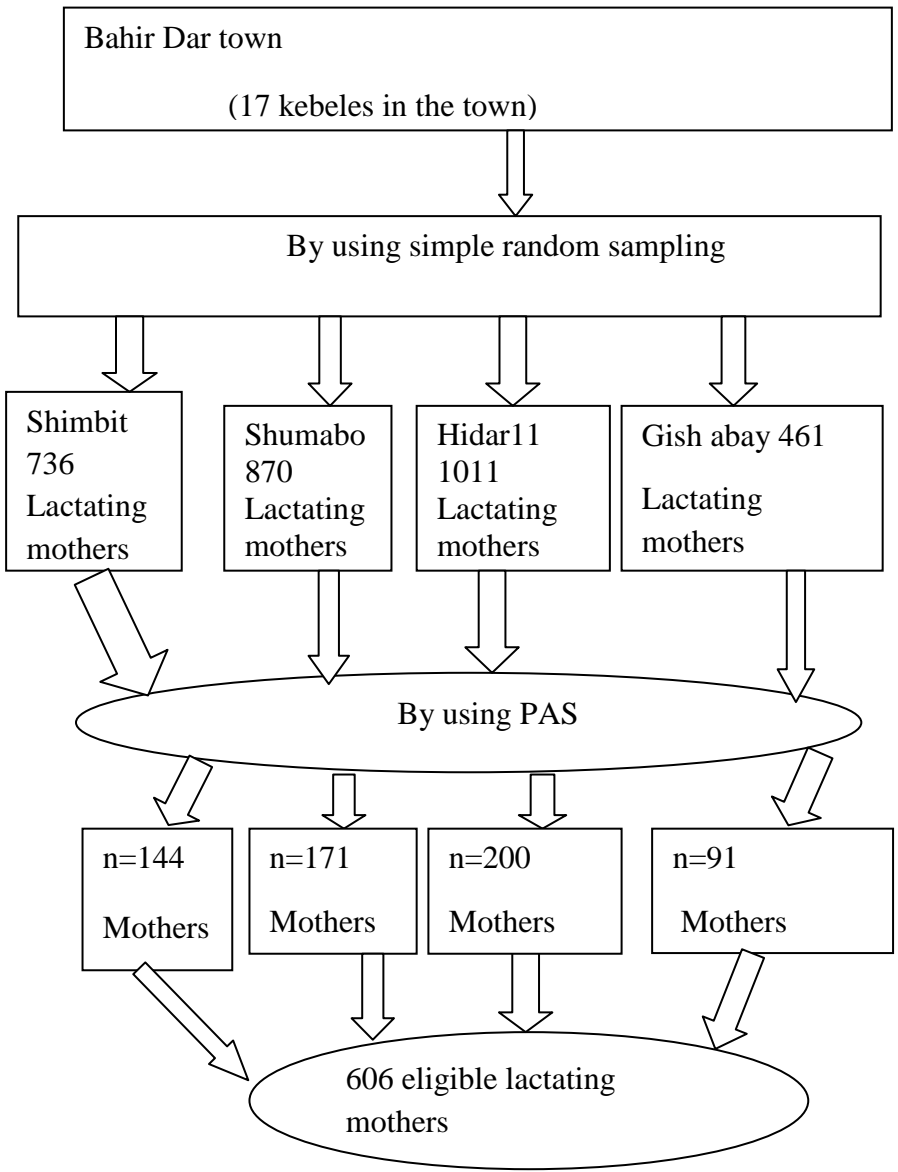


Figure 2. Graphical presentation of sampling procedure among lactating mothers in Bahir Dar city, October –November, 2019. (N=598)

## **5.6. Variables of the study**

### **5.6.1. Dependent variable**

Over nutrition (yes/no)

### **5.6.2. Independent variables**

**Maternal socio-economic and demographic factors:** age, religion, marital status, educational status, race or ethnicity, monthly income, employment status and family size.

**Obstetric and health related factors;** number of deliveries, delivery method and physical activity.

**Breast feeding and dietary related factors;** dietary diversity, food security status, breast feeding duration and family support to her feeding.

**Environmental factors:** Latrine type, Solid waste disposal, Liquid waste disposal and Source of water.

## **5.7. Operational definitions and Terms**

**Household food security status:** House hold food secure; the individuals responded ‘no’ to all of the 9 items or ‘yes’ for worry about running out of food rarely. House hold food insecure; the individual’s responded ‘yes’ to all of the 9 items except worry about running out of food rarely (56).

**Dietary diversity score:** Lactating mothers have adequate dietary diversity score who consumed greater or equal 5 food groups whereas inadequate dietary diversity score who consumed <5 food groups (57).

**Physical activity status:** Lactating mothers is physically active who done physical activities 150 minute and above per week or 600MEQ- minute per week whereas physically inactive who done physical activities less than 150 minute per week or 600MEQ- minute per week(58).

**Ventilated Improved Pit latrine (VIP);**is a dry pit latrine ventilated by a pipe that extends above the latrine roof. The open end of the vent pipe is covered with gauze mesh. Flushes excreta to a hole in the ground or leaching pit (protected covered)(59).



**Traditional latrine;** refers to excreta being deposited in or nearby the household environment (not into a pit, septic tank, or sewer). Excreta may be flushed to the street, yard/plot, open sewer, a ditch, a drainage way or other location(59).

**Protected water source:** which is typically protected from runoff, bird droppings and animals by constructed of piece and building material built around the water so that water flows directly out of the box into a pipe without being exposed to outside pollution(59).

**Tap water/ standpipe;** which are a water service pipe connected with in-house plumbing to one or more taps from which people can collect water. A standpipe is also known as a public fountain or public tap(59).

## **5.8. Data collection tools and procedures**

Interview was used for collecting the data among lactating mothers. The questionnaires which is modified from different standard questionnaires and literatures.

### **Women Dietary diversity**

It indicates individual dietary diversity of lactating mother. It was collected by open recall method. Mothers to describe the foods (meals and snacks) she ate and drank earlier, during the day and night, whether at home or outside the home. The data collector writes down all foods and drinks which are mentioned by mothers. When composite dishes are mentioned, ask for the list of major ingredients. The enumerator, probe for meals and snacks she ate and recall. By counting of each food groups consumed in the previous 24 hours, sum up the number of food groups consumed by each respondent in the 24 hrs. recall period. Finally the dietary diversity score indicated. Mothers had adequate dietary diversity score when she consumes 5 and above food groups. Lactating mothers who consumes <5 food groups were considered as had inadequate dietary diversity score (53).

### **Food security status**

The food security status of household was assessed by 9 items questions with includes options of frequency and occurrence variables which measure the degree of food insecurity (access) scale of household in the past four weeks (30 days). The occurrence of food security status stated: 1 =

rarely(once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks). First, a HFIAS score variable was calculated for each household by summing the codes for each frequency-of-occurrence question. Before summing the frequency-of-occurrence codes, the data should code frequency-of-occurrence as 0 for all cases where the answer to the corresponding occurrence question was “no” (i.e., if Q1=0 then Q1a=0, if Q2=0 then Q2a =0, etc.) for analysis purpose. The maximum score for a household is 27 (the household response to all nine frequency-of-occurrence questions was “often”, coded with response code of 3); the minimum score is 0 (the household responded “no” to all occurrence questions). Frequency-of-occurrence questions were skipped by the interviewer and subsequently coded as 0 during analysis. The higher the score, the more food insecure the household experienced. Lower the score, household experienced food secures(56).

**Anthropometric measurements;** The anthropometric assessment was done according to the standardized procedures stipulated by the Food and Nutrition Technical Assistance (FANTA) Anthropometric Indicators Measurement Guide(57).

**Height;** it was measured to the nearest 0.1 cm in standing position at Frankfurt plane with the occipital, shoulder, the buttock and heel touches the vertical stand with no shoes using aStadiometer Seca (Germany).

**Weight;** it was measured to the nearest 0.1 kg using an electronic weighing scale with wearing light clothes and with no shoes using Seca digital weighing scale. Finally, body mass index were computed.

**Physical activity:** it was measured by asking questions on different aspects of its domain like Activities at work, Travel to and from places, Recreational activities as well as sedentary behavior. Ask about the time participant spend doing different types of physical activity in a typical week. Vigorous-intensity activities are activities that require hard physical effort and cause large increases in breathing or heart rate, moderate-intensity activities are activities that require moderate physical effort and cause small increases in breathing or heart rate. Skips of questions do only apply to the corresponding day and time variables of each domain have been answered negatively. When calculating a person's overall energy expenditure using GPAQ data, 4 METs get assigned to the time spent in moderate activities, and 8 METs to the time spent in

vigorous activities. Skips of questions do only apply to the corresponding day and time variables of each domain have been answered negatively. Participant should do at least 150 minutes of moderate-intensity physical activity, OR 75 minutes of vigorous-intensity physical activity or the combination of moderate- and vigorous-intensity physical activity achieving at least 600 MET-minutes per week. To define physically inactive doing < 600 MET-minutes throughout a week were considered(58).

### **5.9. Data quality control**

Data collectors were two public health officers and one clinical laboratory. The questionnaire was prepared in English version first. Then it was translated to Amharic version (local language) finally retranslated back to English. Training about research question, sampling technique, data handling, quality of data collection and ethical conduct were given for one day for the data collectors. The questionnaire was checked for their completeness every day after data collection by data collector. Regular follow up and supervision were carried out by the supervisor, final corrections and cleaning of the data after entry was made by principal investigator. In order to assess the validity and reliability of the instrument, it was pre-tested on 5% of the calculated sample size of 31 mothers at Ginbot 20 kebele those who are not the actual study participants. The unclear questions were revised and make correction by local language based on the results of the pre-test. Measures of height and weight were done no shoes and light close according to the standard protocol. Measures of height and weight were recorded on the questionnaire and then used to calculate the Body Mass Index (BMI) of mother. The functionality of digital weight scale was checked before use. It was checked it read exactly at zero.

### **5.10. Data Processing, Analysis and Interpretation**

The data were coded, checked for any missing and entered into Epi data version 3.1 and then exported to SPSS version 23 for analysis. To summarize the data and the final result of the study, descriptive statistics such as frequency, percentage, mean and standard deviation were conducted and interpreted in the form of text, figures and tables. Binary logistic regression analysis was computed to see the association between independent and dependent variable, those variables had  $p < 0.2$  were entered to multivariable analysis and identified significant association based on  $p < 0.05$  and odd ratio with 95% CI. The odds ratio, which was determined from the logistic regression coefficients, tells us the increased or decreased chance of over nutrition. Estimates of

odds greater than 1.0 indicate that the risk of over nutrition is greater than that for the reference category. Estimates less than 1.0 indicate that the risk of over nutrition is less than that for the reference category of each variable.

### **5.11. Ethical consideration**

This study was reviewed and approved by Institutional Review Board (IRB) of Bahir Dar University, College of Medicine and Health Science. The ethical clearance was obtained from Institutional Health Research Ethical Review Committee (IHRERC) and Official letters were sent to Bahir Dar city administration and health bureau. Informed consent was obtained from all participants before data collection and confidentiality was maintained by unspecified recording and coding. The aims of the study were clear to each participant and have a right to refuse or discontinue participating in the research without any constraint.

### **5.12. Dissemination of Results**

Result of the study is presented to Bahir Dar University, College of Medicine and Health Science as a partial fulfillment of master's degree in nutrition and public health. It will be also disseminated to Bahir Dar City administration, health offices and kebeles; it will also be presented in different seminars, meetings and workshops. Finally, it will be published in a repeatable journal.

## 6. Result

### 6.1. Socio-economic and demographic factors

From calculated sample size of 606, 598 lactating mothers provided complete questionnaire making a response rate 98.7%. The mean  $\pm$ SD age of participant's was  $36.18 \pm 5.22$  years. Half of 300(50.2%) of study participant were Orthodox in religion and around two third 395(66.1%) were Amhara in ethnicity. About 450(75.3%), 252(42.1%) of the mothers were married and attended college and above education respectively (Table2).

Table 2.Socio-economic and demographic related characteristics of lactating mothers in Bahir Dar city, October-November, 2019. (N=598).

Variables	Total	Percent	
Age	20 -29	59	9.9
	30 -39	295	49.3
	40 -49	244	40.8
Religion	Orthodox	300	50.2
	Muslim	166	27.8
	Protestant	96	16.1
Ethnicity/language	Adventist&jova	36	6
	Amhara	395	66.1
	Oromo	47	7.9
	Tigrie	51	8.5
	Agew	71	11.9
	Somale,SNNRP	34	5.7
Marital status	Single	42	7
	Married	450	75.3
	Divorced	43	7.2
Education	Widowed	63	10.5
	Can read and	31	5.2

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	write		
	Primary	83	13.9
	Secondary	232	38.8
	Collage and above	252	42.1
Occupation	Employed	232	38.6
	Self employed	141	23.6
	Daily worker	36	6
	House wife	111	18.5
	Merchant	78	13
Monthly income	≤5000	94	15.7
	5000-9999	369	61.7
	10000-19999	135	22.6
Family size	<2	16	2.7
	3-5	450	75.3
	>6	132	22.1

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## 6.2. Obstetric and health related characteristics of study participants

About 402(67.2%) of study participant were delivered their child by spontaneous vaginal delivery. Above half of participant 338(56.5) were physically inactive (Table3).

Table 3. Obstetric and health related characteristics of lactating mothers in Bahir Dar city, October -November, 2019. (N=598).

Variables	Total	Percent	
Child number	≤ 1 child	347	58
	2-4 child	225	37.6
	≥ 5	26	4.3
Delivery method	Caesarian section	196	32.8
	Normal vaginal delivery	402	67.2
Physical activity	In active	338	56.5
	Active	260	43.5

### 6.3. Breast feeding and dietary practice of study participants

Above half 334 (55.9%) of the participants were breast feed their children for  $\leq 6$  months. The remaining 164(27.4%), 100(16.7%) of participants were breast feed their children for 6-11 months and  $\geq 12$  months respectively. About 231(38.6%) was not getting family support about her feeding. 590 (98.7%) of participant eat grain.

**Dietary diversity score:** Regarding to dietary diversity score, above half of the participant taking inadequate dietary diversity score 315(52.7%) were eat less than 5 food groups out of 10 food groups

**House hold food security status:** regarding food insecurity status about 257 (43%) was food insecure.

**Nutritional status of participant:** the prevalence of over nutrition was 83(13.9%). Whereas proportion of mothers which showed healthy was 515(86.1%).

**6.4. Environmental related factors;** About 462(77.3%), 590(98.7%) of study participants use ventilated latrine type and tap water source respectively. Only 47 (7.9) burned their solid waste (Table 4).

Table 4. Environmental related characteristics of lactating mothers in Bahir Dar city, October - November, 2019. (N=598).

Variables		Total	Percent
Latrine type	Traditional	136	22.7
	Ventilated	462	77.3
Solid waste disposal	Open field	263	44
	Dumping	25	4.2
	In pit	263	44
	Burning	47	7.9
Liquid waste disposal	Open field	240	40.1
	In pit	356	59.5
	Toilet	2	0.3
Water source	Tap water	590	98.7
	protect spring	6	1
	Unprotect river	2	0.3



### **Factors associated over nutrition of lactating mothers in Bahir Dar city**

The result of bi-variable logistic regression showed that there was a significant association between age of mothers, house hold monthly income, marital status, breast feeding duration, physical activity, dietary diversity, food security and latrine type with over nutrition  $p < 0.2$ , then enter to multivariable logistic regression.

House hold monthly income, breast feeding duration, physical activity and food security were significantly association in multivariable logistic regression  $p < 0.05$ . The participant who were having household monthly income of 5000-9999 Ebr and 10000-19999 Ebr were about 2.99 and 3.31 times more likely to develop over nutrition compared to participants of whose having household monthly income  $\leq 5000$  Ebr (AOR=2.99, 95%CI; 1.28- 6.99 and 3.31, 95%CI; 1.63- 6.72) respectively.

The odds of over nutrition among participants about duration of breast feed to her child  $\leq 6$  months were more than two times compare to those having duration of breast feeding  $\geq 12$  months (AOR=2.98, 95%CI: 1.43-6.23). The odds of over nutrition among participants who were physically inactive were more than three times comparing to doing physical activity actively (AOR=3.56, 95%CI: 2.03-6.25). In addition to those participants who were food secure were 5.29 times more likely develop over nutrition comparing to food insecure (AOR=5.29, 95%CI: 2.94-9.53) (Table 5).

Table 5. The association between selected predictor variables in both bi variable and multivariable logistic regression analysis among lactating mothers in Bahir Dar city October - November, 2019. (N=598).

<b>Variables</b>		<b>Yes</b>	<b>No</b>	<b>COR(95% CI)</b>	<b>AOR(95%CI)</b>
	20 -29	10	49	1	1
	30 -39	51	244	0.98(0.46-2.06)	0.87(0.37-2.06)
Age in year	40 -49	22	222	2.05(0.92-4.63)	2.03(0.80-5.10)
Marital status	Single	2	40	0.66(0.09-4.85)	0.25(0.05-1.18)
	Married	74	376	0.17(0.04-0.69)	0.31(0.05-1.90)
	Divorced	5	38	0.25(0.046-1.35)	0.52(0.19-12.3)
	Widowed	2	61	1	1
Income	≤5000	20	74	1	1
	5000-9999	47	322	1.85(1.04- 3.31)	2.99(1.28- 6.99)*
	10000-19999	16	119	2.01(0.98-4.12)	3.31(1.63-6.72)*
	in active	32	306	2.33(1.45-3.75)	3.56(2.03-6.25)*
Physical activity	Active	51	209	1	
	≤6 month	24	310	2.64(1.35-5.15)	2.98(1.43-6.23)*
Duration of breast feeding	7-11 month	42	122	0.59(0.32-1.12)	0.61(0.29-1.23)
	≥ 12 month	17	83	1	
DDS	Inadequate	37	278	1.45(0.91-2.32)	1.29(0.73-2.27)
	Adequate	46	237	1	
Food security	Secure	21	320	4.85(2.86-8.19)	5.29(2.94-9.53)*
	Insecure	62	195	1	
Latrine type	Traditional	12	124	1	
	Ventilated	71	391	1.67(0.21-1.02)	0.65(0.31-1.34)

\* Variables significantly associated with over nutrition of lactating mothers. COR=crude odd ratio AOR=adjusted odd ratio Yes /no=number of over nutrition.

## 7. Discussion

According to the findings of this study the prevalence of over nutrition among lactating mothers were 13.9(CI: 11.2-16.9). House hold monthly income, breast feeding duration, physical activity and food security have showed significant association with over nutrition.

The prevalence of over nutrition in the current study were consistent with studies done in Addis Ababa and urban Ethiopian women including lactating mothers 13.6%, 14.9% respectively(19, 38).It may be exposure of sedentary life and high energy dense foods availability in Bahir Dar compare to Addis Ababa might explain consistent as a whole. The limited accessibility of place and time for physical activity, more concentrate to vehicles transportation than walking exposed mothers doing less physical activity. In addition the dietary intake concentrated on high protein and energy diet related with easily access at local market and also it used for express as good diet than fruit and vegetables. But participants better to concentrate fruit and vegetables than energy dense foods to protect over nutrition.

Whereas the prevalence of over nutrition in this study was lower than the study done at other developing and developed countries like Bagdad 55.4%, Europe 16.91%and Brazil 64.9% (28, 29, 33).The reason for the variability may be attributed to socioeconomic variability including income. The income variability for those developing countries and study area may expose to concentrate on locally available foods. For study area having lower income participants more concentrate at fruit and vegetables which is prevent over nutrition than those having higher income countries that is feed high protein diet (19).

Besides to that this study prevalence was higher than the prevalence of 2016 Ethiopian demographic health survey 8.1%(17).The difference may be study of EDHS was conducted on generally urban and rural, which was the rural participants may doing extraneous work, does not have greater exposure to energy dense foods and less disposed to over nutrition comparing to urban(32). The findings of this study revealed that risks of over nutrition among participants who were increased monthly income were highly risk compared to those lower monthly incomes. Those have monthly income 10000-19999 Ebr were more risk compare to lower income group  $\leq$  5000Ebr indicate higher income group use more energy dense foods and high fat diet because those foods are easily accessible and used as lexuierly. This is consistent to study done at

Hawasa (42). The reason may be increased income attribute to the change in life style and dietary pattern. Higher income which in turn might be exposed to high energy dense foods in both cities. In addition, a participant from high income usually uses vehicles for transportation and decrease physical activity level (55). Participants who did not do physical activities actively were more likely to develop over nutrition compared to participants who were doing physical activities actively. This indicates not doing physical activity at work, walking or transportation and recreational domain expose to gain body weight. This finding is in line with other studies done at Addis Ababa, Brazil and Mazandaran University of Medical Sciences stated does not doing physical activities in the recommendation way were associated with occurrence of over nutrition(19, 28, 46).

The reason might be does not doing physical activities actively exposed to decrease burns off body fat that associated with more risk of over nutrition. In addition to this the main factor to increase over nutrition is decrease energy expenditure by lower level of physical activity and increasing level of sedentary behavior including longer sitting on transportation, watching television, for recreation, reading and working long time on computer. Besides to those doing physical activity below recommendation and irregularly may be also the predisposing factor. In addition not doing physical activity may be negatively influences the personal perception of quality of life and wellbeing (19, 60).

The finding of this result indicated there was association between breast feeding duration and over nutrition, short duration of breast feed  $\leq 6$  months were more risk to over nutrition than breast feed for long time  $\geq 12$  months. This is in line with study done at Afro-American mothers breastfeed for more than 6 months had significantly lower over nutrition of postpartum than breast feed less than 6 months (7, 8).The reason may be common practice to consume energy dense food supplements during early post-partum period. In public health perspective since members of the same family are influenced by several of the same risk factors, some of which may be modified during postnatal care and more concentrate on fat diet. To meet the requirements of dietary energy for breast milk creation and improving maternal recovery after childbirth which averts maternal nutrition status more expose to over nutrition. Mothers who are feed breast milk to their child exclusive use an approximate daily energy expenditure of 2100 kJ or energy need increase at least by 550 Kcal during lactation, to compensate this requirement

mothers eat more energetic food than the previous. Further, most women exposed relatively changes sedentary behavior in the post-partum period. In addition, information about early beginning of complementary feeding whether the infant received other foods or liquids that cause decrease ability to mother's breast feed her child predispose mother to retain weight. It may be difference in source population, study area and statistical methods between studies. Finally because of difference how weight retention and BF practice were assessed(5, 61).

Finding of this study indicates participants who were food secure are more likely developed over nutrition comparing to food insecure. This means being food secure household based on standard criteria develop over nutrition than households being insecure. Similar to this study conducted in Mexico revealed that being food secure were significantly associated with over nutrition of mother(40). The cost of high protein diet and other energy dense foods is high compare to vegetables and fiber diets based on countries context. So food secure participants more expose to those high protein diet and other energy dense than food insecure participant who use low cost foods. For this reason, the food secure situation of urban households tends to be more tightly linked to their income and purchasing power. It is usually more dependent on costly food availability linked to local production. It may adversely impact the nutrition and health of lactating mothers one of the ways is by affecting dietary quality and diversity dependent on monotony diet than diversified(49, 62).

Contrast to this in both developing and developed countries like USA, Nigeria being food insecure are more likely develop over nutrition comparing to food secure(48-51). Exploring possible reasons for this difference is based on countries context and house hold income. In developed countries, food insecure participants more expose to over nutrition related with economic barriers to healthy foods because of more expensive of organic foods like vegetable and fruits than inorganic based on countries context. Those exposed to low cost foods like fast foods and high energy dense foods. Urban centers in low and middle income populations operate as cash-based economies where food and other household needs are obtained primarily through local market systems concentrate on cheapest. Cash income is critical since food costs alone may comprise as much as half or more of an urban house holds monthly expenditures. Consistent supply of foods in the urban marketplace prices are low enough for households to afford one that can alter eating behaviors and potentially influence fat storage. Food insecure households expose

to stress because of thought to be brought. This threat raise the hypothalamus–pituitary–adrenal axis setting off a cascade of hormones such as cortisol, insulin and leptin as well as neuropeptide Y that directly influence the accumulation of visceral fat storage (49).

## **8. Limitation**

Even though this study addressed very important variables that affect over nutrition. The global physical activity questioner which is appropriate for adults were used for lactating mothers. The deformed participants do not measure by body mass index. Pregnant mothers who are breast feed. Food insecurity questioner for house hold is used to assess individual members.

## **9. Conclusion and Recommendation**

**Conclusion:** This study demonstrated that the prevalence rates of over nutrition among lactating mothers were high compare to EDHS2016. Monthly income, physically activity, duration of breast feeding and food security status were found to be risk factors for over nutrition of lactating mothers in Bahir Dar City.

**Recommendation:** Increasing household incomes is one of the risk factor associated with lactating mothers over nutrition. It is motivated at the country, house hold as well as by individual level. Unless implementing effective strategies to developed good knowledge related with utilization of income, Ethiopian will over challenged by over nutrition burden.

Therefore, Federal ministry of health should be developing Ethiopian dietary and physical activity guideline based on countries context.

Regional health bureau should be done collaborate with education and agricultural sectors regarding implementation of their effort to feeding, accessibility to done physical activity and breast feeding area especially employed mothers.

Moreover, Participants as well as all lactating mothers should be committed to do physical activities regularly in the recommended level. Especially food secure participants should be concentrating on healthy diets than high energy dense foods. Health extension workers should be assess house to house practice of breast feeding collaborates with media. Researcher should be done longitudinal study beginning from pregnancy up to long period of breast feeding.

## REFERENCE

1. World Health Organization, Key Centre for Women's Health in Society. Mental health aspects of women's reproductive health: a global review of the literature: World Health Organization; 2014.
2. Stephen AA, Joshua AO. Determinants of maternal utilization of health services and nutritional status in a rural community in South-West Nigeria. *African journal of reproductive health*. 2016;20(2):72-85.
3. Gebremariam LW, Chiang C, Yatsuya H, Hilawe EH, Kahsay AB, Godefay H, et al. Non-communicable disease risk factor profile among public employees in a regional city in northern Ethiopia. *Scientific reports*. 2018;8(1):9298.
4. Kimani-Murage EW, Muthuri SK, Oti SO, Mutua MK, van de Vijver S, Kyobutungi C. Evidence of a double burden of malnutrition in urban poor settings in Nairobi, Kenya. *PloS one*. 2015;10(6):e0129943.
5. Kajale NA, Khadilkar VV, Mughal M, Chiplonkar SA, Khadilkar AV. Changes in body composition of Indian lactating women: a longitudinal study. *Asia Pacific journal of clinical nutrition*. 2016;25(3):556.
6. Fikawati S. Pengaruh vegetarian terhadap status gizi ibu postpartum, durasi ASI predominan, dan pertumbuhan bayi: studi Kohort di 5 kota: [Doctoral Dissertation]. Depok: Public Health Study Program, Public Health ...; 2013.
7. Mastroeni MF, Mastroeni SSdBS, Czarnobay SA, Ekwaru JP, Loehr SA, Veugelers PJ. Breast-feeding duration for the prevention of excess body weight of mother–child pairs concurrently: a 2-year cohort study. *Public health nutrition*. 2017;20(14):2537-48.
8. Palmer JR, Kipping-Ruane K, Wise LA, Yu J, Rosenberg L. Lactation in relation to long-term maternal weight gain in African-American women. *American journal of epidemiology*. 2015;181(12):932-9.
9. Rehr M, Shoaib M, Ellithy S, Okour S, Ariti C, Ait-Bouziad I, et al. Prevalence of non-communicable diseases and access to care among non-Camp Syrian refugees in northern Jordan. *Conflict and health*. 2018;12(1):33.
10. Collaboration NRF. Worldwide trends in children's and adolescents' body mass index, underweight, overweight and obesity, in comparison with adults, from 1975 to 2016: a pooled analysis of 2, 416 population-based measurement studies with 128.9 million participants. *Lancet*. 2017;390:2627-42.
11. Mullaney L, O'Higgins AC, Cawley S, Kennedy R, McCartney D, Turner MJ. Breast-feeding and postpartum maternal weight trajectories. *Public health nutrition*. 2016;19(8):1397-404.
12. Ofori-Asenso R, Agyeman AA, Laar A, Boateng D. Overweight and obesity epidemic in Ghana—a systematic review and meta-analysis. *BMC Public Health*. 2016;16(1):1239.
13. Amugsi DA, Dimbuene ZT, Mberu B, Muthuri S, Ezech AC. Prevalence and time trends in overweight and obesity among urban women: an analysis of demographic and health surveys data from 24 African countries, 1991–2014. *BMJ open*. 2017;7(10):e017344.
14. Sarma H, Saquib N, Hasan MM, Saquib J, Rahman AS, Khan JR, et al. Determinants of overweight or obesity among ever-married adult women in Bangladesh. *BMC obesity*. 2016;3(1):13.
15. Tebekaw Y, Teller C, Colón-Ramos U. The burden of underweight and overweight among women in Addis Ababa, Ethiopia. *BMC Public Health*. 2014;14(1):1126.
16. Birhane T, Shiferaw S, Hagos S, Mohindra KS. Urban food insecurity in the context of high food prices: a community based cross sectional study in Addis Ababa, Ethiopia. *BMC Public Health*. 2014;14(1):680.
17. Demographic CE. Health Survey-2011. Central Statistical Agency Addis Ababa. Ethiopia ICF International Calverton, Maryland, USA. 2012. 2016.
18. Tikuye HH, Gebremedhin S, Mesfin A, Whiting S. Prevalence and Factors Associated with Undernutrition among Exclusively Breastfeeding Women in Arba Minch Zuria District, Southern Ethiopia: A Cross-sectional Community-Based Study. *Ethiopian journal of health sciences*. 2019;29(1).

19. Shegaze M, Wondafrash M, Alemayehu AA, Mohammed S, Shewangezaw Z, Abdo M, et al. Magnitude and determinants of overweight and obesity among high school adolescents in Addis Ababa, Ethiopia. *Int J Med Health Biomed Bioeng Pharm Eng*. 2016;10(10):215-21.
20. Arianas EA, Rankin KM, Norr KF, White-Traut RC. Maternal weight status and responsiveness to preterm infant behavioral cues during feeding. *BMC pregnancy and childbirth*. 2017;17(1):113.
21. Talmor A, Dunphy B. Female obesity and infertility. *Best Practice & Research Clinical Obstetrics & Gynaecology*. 2015;29(4):498-506.
22. Mkuu RS, Epnere K, Chowdhury MAB. Peer reviewed: prevalence and predictors of overweight and obesity among Kenyan women. *Preventing chronic disease*. 2018;15.
23. Engidaw MT, Gebremariam AD, Tiruneh SA, Asnakew DT, Abate BA. Chronic Energy Deficiency and its Associated Factors Among Lactating Women in Debre Tabor General Hospital, Northcentral Ethiopia. *Journal of Family Medicine and Health Care*. 2019;5(1):1-7.
24. Abeya S, Biru K, Jima A. Factors Associated with Underweight among Lactating Mothers in Adama District, Oromia Region, Ethiopia. *J Orthop Bone Res* 1: 101 Abstract Keywords: Lactating Women. 2018.
25. Henjum S, Torheim LE, Thorne-Lyman AL, Chandyo R, Fawzi WW, Shrestha PS, et al. Low dietary diversity and micronutrient adequacy among lactating women in a peri-urban area of Nepal. *Public health nutrition*. 2015;18(17):3201-10.
26. Haddad LJ, Hawkes C, Achadi E, Ahuja A, Ag Bendeck M, Bhatia K, et al. Global Nutrition Report 2015: Actions and accountability to advance nutrition and sustainable development: Intl Food Policy Res Inst; 2015.
27. Ng M, Fleming T, Robinson M, Thomson B, Graetz N, Margono C, et al. Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The lancet*. 2014;384(9945):766-81.
28. Zanotti J, Capp E, Wender MCO. Factors associated with postpartum weight retention in a Brazilian cohort. *Revista Brasileira de Ginecologia e Obstetrícia*. 2015;37(4):164-71.
29. McKeating A, Maguire PJ, Daly N, Farren M, McMahon L, Turner MJ. Trends in maternal obesity in a large university hospital 2009–2013. *Acta obstetrica et gynecologica Scandinavica*. 2015;94(9):969-75.
30. Haque MM, Mandal S, Sultana J. Nutritional status and associated socioeconomic factors of 15-49years garo ethnic women residing in northern part of Bangladesh: a cross sectional observational survey. *Age*. 2015;11:0.011.
31. He Y, Pan A, Yang Y, Wang Y, Xu J, Zhang Y, et al. Prevalence of underweight, overweight, and obesity among reproductive-age women and adolescent girls in rural China. *American journal of public health*. 2016;106(12):2103-10.
32. Bwalya BB, Mapoma CC, Mulenga JN. Rural-urban differentials in the prevalence of overweight and obesity among women of child bearing age in Zambia. *Epidemiology, Biostatistics and Public Health*. 2017;14(2).
33. Abed BK, Zeidan MAK, Hussain SA. Obesity and Overweight in a Sample of Women at Child Bearing Age in Baghdad City. *Medical Journal of Babylon*. 2016;13(1):214-23.
34. Ravaoarisoa L, Randriamanantsaina L, Rakotonirina J, Rakotomanga JdDM, Donnen P, Dramaix MW. Socioeconomic determinants of malnutrition among mothers in the Amoron'i Mania region of Madagascar: a cross-sectional study. *BMC Nutrition*. 2018;4(1):6.
35. Sanou MS, Kien-Atsu T, Djeunang BD, Fotso J, TiotsiaTsapi A, Azeufack YN, et al. Nutrition Habits and Health Outcomes of Breastfeeding HIV-positive mothers in the Dschang Health District, West Region Cameroon. *Igiene e sanita pubblica*. 2016;72(5):417-27.
36. Zerihun E, Egata G, Mesfin F. Under Nutrition and its Associated Factors among Lactating Mothers in Rural Ambo District, West Shewa Zone, Oromia Region, Ethiopia. *East African Journal of Health and Biomedical Sciences*. 2016;1(1):39-48.



37. Julla BW, Haile A, Ayana G, Eshetu S, Kuche D, Asefa T. Chronic Energy Deficiency and Associated Factors among Lactating Mothers (15-49 years old) in Offa Woreda, Wolayita Zone, SNNPRs, Ethiopia. *World Scientific Research*. 2018;5(1):13-23.
38. Abrha S, Shiferaw S, Ahmed KY. Overweight and obesity and its socio-demographic correlates among urban Ethiopian women: evidence from the 2011 EDHS. *BMC Public Health*. 2016;16(1):636.
39. O'Sullivan EJ, Perrine CG, Rasmussen KM. Early breastfeeding problems mediate the negative association between maternal obesity and exclusive breastfeeding at 1 and 2 months postpartum. *The Journal of nutrition*. 2015;145(10):2369-78.
40. Shamah-Levy T, Mundo-Rosas V, Morales-Ruan C, Cuevas-Nasu L, Méndez-Gómez-Humarán I, Pérez-Escamilla R. Food insecurity and maternal-child nutritional status in Mexico: cross-sectional analysis of the National Health and Nutrition Survey 2012. *BMJ open*. 2017;7(7):e014371.
41. Salim F, Begum N. Nutritional status and knowledge about nutrition during pregnancy among pregnant and postpartum women. *Northern International Medical College Journal*. 2015;6(2):61-3.
42. Bereket AH, Beyero M, Fikadu AR, Bosha T. Risk factors for overweight and obesity in private high school adolescents in Hawassa city, Southern Ethiopia: a case-control study. *Food Public Health*. 2017;7:29-34.
43. Tuoyire DA, Kumi-Kyereme A, Doku DT. Socio-demographic trends in overweight and obesity among parous and nulliparous women in Ghana. *BMC obesity*. 2016;3(1):44.
44. Kirchengast S, Hartmann B. Maternal obesity increases the risk of primary as well as secondary caesarean section. *Ann Obes Disord*. 2017;2:1017-21.
45. López-Olmedo N, Hernández-Cordero S, Neufeld LM, García-Guerra A, Mejía-Rodríguez F, Gómez-Humarán IM. The associations of maternal weight change with breastfeeding, diet and physical activity during the postpartum period. *Maternal and child health journal*. 2016;20(2):270-80.
46. Keymaram S, Farzanegi P, Azadbakht L, Alinejad H. The Relationship Between Dietary Diversity with General and Abdominal Obesity in Female Amateur Athletes of Mazandaran University of Medical Sciences. *Hormozgan Medical Journal*. 2018;22(3):3.
47. Samadi M, Zeinaly F, Mohammadi SG, Alipour M, Samani HA. The relationship between obesity and dietary patterns: review on evidence. *J Clin Exc*. 2014;4:72-89.
48. Dhurandhar EJ. The food-insecurity obesity paradox: A resource scarcity hypothesis. *Physiology & behavior*. 2016;162:88-92.
49. Laraia B, Vinikoor-Imler LC, Siega-Riz AM. Food insecurity during pregnancy leads to stress, disordered eating, and greater postpartum weight among overweight women. *Obesity*. 2015;23(6):1303-11.
50. Cheung HC, Shen A, Oo S, Tilahun H, Cohen MJ, Berkowitz SA. Peer reviewed: Food insecurity and body mass index: A longitudinal mixed methods study, Chelsea, Massachusetts, 2009–2013. *Preventing chronic disease*. 2015;12.
51. Asomugha IC, Uwaegbute A, Obeagu EI. Food insecurity and nutritional status of mothers in Abia and Imo states, Nigeria. *Int J Adv Res Biol Sci*. 2017;4(10):62-77.
52. Abdollahpour S, Ramezani S, Khosravi A. Perceived social support among family in pregnant women. *International Journal of Pediatrics*. 2015;3(5.1):879-88.
53. Sihite DS, Fikawati S, Syafiq A. Maternal Energy Intake at the Sixth Month as Dominant Factor of Exclusive Breastfeeding Success. *Kesmas: National Public Health Journal*. 2017;12(2):87-92.
54. Desalegn BB, Lambert C, Riedel S, Negese T, Biesalski HK. Ethiopian orthodox fasting and lactating mothers: Longitudinal study on dietary pattern and nutritional status in rural Tigray, Ethiopia. *International journal of environmental research and public health*. 2018;15(8):1767.
55. Anteneh ZA, Gedefaw M, Tekletsadek KN, Tsegaye M, Alemu D. Risk factors of overweight and obesity among high school students in Bahir Dar City, north West Ethiopia: school based cross-sectional study. *Advances in preventive medicine*. 2015;2015.
56. Coates J, Swindale A, Bilinsky P. Household Food Insecurity Access Scale (HFIAS) for measurement of food access: indicator guide: version 3. 2007.

57. Ogechi UPIAf. Dietary Diversity as a Measure of Micronutrient Adequacy of Women's Diets in Resource-Poor Areas | Food and Nutrition Technical Assistance III Project (FANTA. <http://www.fantaproject.org/research/womens-dietary-diversity-project>. [cited 2015 Dec 26].
58. Armstrong T, Bull F. Development of the world health organization global physical activity questionnaire (GPAQ). *Journal of Public Health*. 2006;14(2):66-70.
59. Organization WH. Core questions on drinking water and sanitation for household surveys: World Health Organization; 2006.
60. van der Pligt P, Olander EK, Ball K, Crawford D, Hesketh KD, Teychenne M, et al. Maternal dietary intake and physical activity habits during the postpartum period: associations with clinician advice in a sample of Australian first time mothers. *BMC pregnancy and childbirth*. 2016;16(1):27.
61. Swanson V, Keely A, Denison FC. Does body image influence the relationship between body weight and breastfeeding maintenance in new mothers? *British journal of health psychology*. 2017;22(3):557-76.
62. Gubert MB, Spaniol AM, Segall-Corrêa AM, Pérez-Escamilla R. Understanding the double burden of malnutrition in food insecure households in Brazil. *Maternal & child nutrition*. 2017;13(3):e12347.

## **Annexes**

### **Annexes 1.Participant Information Sheet**

Good morning/ afternoon?

My name is Samrawit Melaku. Currently I am a post graduate student at Bahir Dar University, College of medicine and Health Sciences, School of Public health, Department of nutrition and dietetics. Now I am conducting a research to assess over nutrition and associated factors of lactating mothers who have children's age between 6 weeks to 24 months in Bahir Dar town.

**Title of the research:** assessment of over nutrition and associated factors of lactating mothers who have children's age between 6 weeks to 24 months in Bahir Dar town, North West Ethiopia, 2019.

**Objective:** to assess over nutrition and associated factors of lactating mothers who have children's age between 6 weeks to 24 months in Bahir Dar town, 2019.

**Participants:** Systematical selected lactating mothers who have children's age between 6 weeks to 24 months.

**Potential Risks:** There is no foreseen risk by being participating in this study.

**Benefits:** No financial benefits are related with this study. But by participating in this study, you acquire or increase knowledge related to the importance of breast feeding with relate to over nutrition.

I would like to ask you few questions. Your honest response to the questions can make the study to achieve its objective. All the information that you give will be kept confidential and private. Only the principal investigator and interviewer have access to the information. You are kindly requested to respond voluntarily. You can also choose not to participate in this study or if you become uncomfortable during the study, you will be allowed to leave the study at any time. At any time if you have questions, you can contact me by using the following addresses.

**Samrawit Melaku**

**Mobile:** 09 02 72 48 63, **E-mail:** [samryemelaku@gmail.com](mailto:samryemelaku@gmail.com)

## Annexes 2. Informed consent

Bahir Dar University

College of Medicine and Health Sciences

School of Public Health

Department of public health nutrition

I here with declare that:

- ✓ The objectives of this study are explained to me and also clear.
- ✓ The contents of the consent are verified to me to participate in the study.

I understand that participation in this study is completely voluntary and that I may withdraw at any time without supplying reasons. I agree to participate in this study to be interviewed, provided my privacy is guaranteed. When signing this consent form to participate in the study, I promise to answer honestly to all reasonable questions and not provide any false information or in any other way purposely mislead the researcher.

Signature of the participant \_\_\_\_\_ date \_\_\_\_\_

Signature of the investigator \_\_\_\_\_ date \_\_\_\_\_

### Annexes 3.English Version Questionnaire

Name of data collector.....

Questionnaire code/ID .....

Participant code.....

**Instruction for interviewer:** - Circle the responses for questions with alternatives and write for open ended questions on the space provided.

Part 1: Socioeconomic and demographic characteristics of mother

Socioeconomic and demographic characteristics of mother			
S/no	Question	Alternative Answer	Skip
101	How old are you?	..... years	
102	What is your religion?	1. Orthodox 2. Muslim 3. Protestant 4. Others (specify).....	
103	Your belonging ethnicity?	1. Amhara 2. Oromo 3. Tigrie 4. Agew 5. Others (specify).....	
104	What is your level of education?	1. can read and write 2. Primary school 3. Secondary school 4. College and above	
105	What is your marital status?	1. Single 2. Married 3. Divorced	

		4. Widowed	
106	What is your occupational status?	<ol style="list-style-type: none"> <li>1. Employed(government)</li> <li>2. Self employed(NGO)</li> <li>3. Daily laborer</li> <li>4. House wife</li> <li>5. Merchant</li> </ol>	
107	What is your house hold monthly income?	.....birr	
108	What is your family size in number?	.....number	
109	Maternal weight?	-----kg	
110	Maternal height?	-----cm	
111	BMI?	-----cm	
<b>Part 2. obstetric and health related factors</b>			
201	How many children do you have?	.....number	
202	What was your mode of delivery?	<ol style="list-style-type: none"> <li>1. Caesarian section</li> <li>2. Normal Vaginal delivery</li> </ol>	
<b>Physical activity questions;</b>			
Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Vigorous intensity activity is that causes large increases in breathing or heart rate,			

moderate-intensity activity is that causes small increases in breathing or heart rate.			
<b>Activity at work</b>			
203	Does your work involve vigorous-intensity activity like [carrying or lifting heavy loads, digging or construction work etc.] for at least 10 minutes continuously?	1. Yes 2. No	If No, go to 207
204	How many days do you do a week?	-----days	
205	How much time do you spend a week?	----- hr/min	
206	Does your work involve moderate-intensity activity, such as (brisk walking [or carrying light loads] etc.) for at least 10 minutes continuously?	1. Yes 2. no	If No, go to 210
207	How many days do you do a week?	----- days	
208	How much time do you spend a week?	----- hr/min	
<b>Travel to and from places</b>			
209	Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places?	1. Yes 2. No	If No, go to 213
210	How many days do you do a week?	-----days	
211	How much time do you spend a week?	----- hr/min	
<b>Recreational activities</b>			
212	Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities like [running or football etc.] for at least 10 minutes continuously?	1. Yes 2. No	If no go to 216
213	How many days do you do a week?	-----days	
214	How much time do you spend a week?	---- hr/min	

215	Do you do any moderate-intensity sports, fitness or recreational (leisure) activities such as brisk walking,(cycling, swimming, volleyball etc.) for at least 10 minutes continuously?	1. Yes 2. no	If no go to 219
216	How many days do you do a week?	----- days	
217	How much time do you spend a week?	---- hr/m in	
<b>Sedentary behavior</b>			
218	How much time do you usually spend sitting (travel on bus, reading, watching television etc)	----- hr/min	
<b>Part 3 breast feeding and dietary related factors</b>			
<b>Dietary diversity</b>			
Please describe the foods (meals and snacks) that you ate yesterday during the day and night, whether at home or outside the home. Start with the first food eaten in the morning.			
Descriptiondetail description			
Breakfast			
Snack			
Lunch			
Snack			
Dinner			
Snack			
301	Do you consume grain, white root, tuber in previous 24 h? (corn/maize, rice, wheat, sorghum, maize, millet or cassava or any other grains or foods made from these(e.g. bread, pastes porridge potatoes, white-fleshed sweet potatoes, white yams, yucca or other grain products...)	1. Yes 2. No	
302	Do you consume pulses in previous 24 h?	1. Yes	



	(Beans, peas, lentils, chickpea, and soybean or foods products made from these...)	2. No	
303	Do you consume meat, poultry and fish in previous 24 h? (organ meat, beef, pork, lamb, goat, chicken, fresh or dried fish or shellfish)	1. Yes 2. No	
304	Do you consume eggs in previous 24 h?	1. Yes 2. No	
305	Do you consume nut, seed (peanuts) in previous 24 h?	1. Yes 2. No	
306	Do you consume milk and milk products in previous 24 h? (cheese, yogurt or other milk products...)	1. Yes 2. No	
307	Do you consume dark green leafy vegetables in previous 24 h?(green paper, spinach, habesha gommen ,broccoli, kiyar, kosta...).	1. Yes 2. No	
308	Do you consume other vegetables in previous 24 h?(cucumber, tomato, green and fresh bean ,pea, chickpea etc...)	1. Yes 2. No	
309	Do you consume other fruits previous 24 h? wild fruits, sweet potato, carrot, pumpkin, green papaya, banana, orange and mango....)	1. Yes 2. No	
310	Do you consume other vitamin A rich fruits and vegetables in previous 24 h?(ripe apricot, peach, mango, avocado, carrot, papaya, deep yellow banana and orange)	1. Yes 2. No	
<b>Food security status</b>			
311	HFIAS 9 items Did you worried about running out of food in the previous 30 days?	1. Yes 2. No	If yes Q 311go to Q 312

312	How often did this happen?	<ol style="list-style-type: none"> <li>1. Rarely (&lt;3times)</li> <li>2. Sometimes (3-10)</li> <li>3. Often(&gt;10)</li> </ol>	
313	Was there lack of preferred food in the previous 30 days?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	If yes Q 313 go to Q 314
314	How often did this happen?	<ol style="list-style-type: none"> <li>1. rarely(&lt;3times)</li> <li>2. sometimes(3-10)</li> <li>3. often (&gt;10)</li> </ol>	
315	Were there limited accesses to a variety of foods due to a lack of resources in the previous 30 days?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	If yes Q 315 go to Q 316
316	How often did this happen?	<ol style="list-style-type: none"> <li>1. rarely(&lt;3times)</li> <li>2. sometimes(3-10)</li> <li>3. often(&gt;10)</li> </ol>	
317	Did you force to eat you does not want to eat due to lack of resources in the previous 30 days?	<ol style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ol>	If yes Q 317 go to Q 318
318	How often did this happen?	<ol style="list-style-type: none"> <li>1. rarely(&lt;3times)</li> <li>2. sometimes(3-10)</li> <li>3. Often (&gt;10)</li> </ol>	

319	Did you eating smaller portions in the previous 30 days?	1. Yes 2. No	If yes Q 319 go to Q 320
320	How often did this happen?	1. rarely(<3times) 2. sometimes(3-10) 3. often (>10)	
321	Did you skipping eat (few)meals in the previous 30 days?	1. Yes 2. No	If yes Q 321 go to Q 322
322	How often did this happen?	1. rarely(<3times) 2. sometimes(3-10) 3. often (>10)	
323	Are there ran out of food in the household in the previous 30 days?	1. Yes 2. No	If yes Q 323 go to Q 324
324	How often did this happen?	1. rarely(<3times) 2. someti mes(3-10) 3. often (>10)	
325	Did you going to sleep hungry in the previous 30 days?	1. Yes 2. No	If yes Q 325 go to Q 326
326	How often did this happen?	1. rarely(<3times)	

		<ul style="list-style-type: none"> <li>2. sometimes (3-10)</li> <li>3. often (&gt;10)</li> </ul>	
327	Did you go 24 h without food in the previous 30 days?	<ul style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ul>	If yes Q 327 go to Q 328
328	How often did this happen?	<ul style="list-style-type: none"> <li>1. rarely (&lt; 3 times)</li> <li>2. sometimes (3-10)</li> <li>3. often (&gt;10)</li> </ul>	
328	Did you get family support?	<ul style="list-style-type: none"> <li>1. Yes</li> <li>2. No</li> </ul>	
329	How often your breast feeding duration?	<ul style="list-style-type: none"> <li>1. ≤6 months</li> <li>2. 7-11 months</li> <li>3. ≥12 months</li> </ul>	
<b>Part 4 Environmental factors</b>			
401	What is your type of Latrine?	<ul style="list-style-type: none"> <li>1. Traditional</li> <li>2. ventilated</li> </ul>	
402	Where is your solid waste disposal	<ul style="list-style-type: none"> <li>1. open field</li> <li>2. dumping</li> <li>3. in pit</li> <li>4. burning</li> </ul>	
403	Where is your liquid waste disposal	<ul style="list-style-type: none"> <li>1. open field</li> <li>2. in pit</li> <li>3. other</li> </ul>	

404	What is your source of water	1.tap water 2.protected spring	
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Bahir Dar University

College of medicine and Health Sciences

School of Public Health

Department of nutrition

**Annexes 4.የተሳታፊዎች መረጃ መስጫ ቅጽ- በአማርኛ**

እንደምን ዋሉ/ አደራ? ሳምራዊት መሳከ ኦባሳህቤ :በባህረ ዳር ዩኒቨርሲቲ ህክምናና ጤና ሳይንስ ኮሌጅ: በሰነ-ምግብ እና ስነ ህዝብ ትምህርት ክፍል የ2ኛ ዓመት የማስትሬት ዲግሪ ተመራጭ ተማሪ ነኝ :: በአሁኑ ሰዓት በባህርዳር ከተማ ባሉ ቀበሌዎች የህጻናትዕድሜ ከ6 ሳምንት እስከ 24 ወራት ያሉ የልጅ እናቶችን ከመጠን በላይ ወፍረትምዘናና ተዛማጅ ችግሮችን በማጥናት ሳይ ነኝ::

የጥናቱ ርዕስ:- ከ6 ሳምንት እስከ 24 ወራት ዕድሜ ያሉ የልጅ እናቶች ከመጠን በላይ ወፍረት ምዘናና ተዛማጅ ችግሮች ፣ በባህርዳር ከተማ ባሉ ቀበሌዎች ባህረ ዳር ስነተዳደር አማራ ብሔራዊ ክልላዊ መንግስት፣ ኢትዮጵያ፣ 2011ዓ.ም::

የጥናቱ ዓላማ:-ከ6 ሳምንት እስከ 24 ወራት ዕድሜ ያሉ ጡት የሚያጠቡ የልጅ እናቶችን ከመጠን በላይ ወፍረት ና ተደያኝ ችግሮችን ማወቅ::

ተሳታፊዎች:- ባህረዳር ከተማ ውስጥ ባሉ ቀበሌዎችከ6 ሳምንት እስከ 24 ወራት ዕድሜ ክልል ያሉ ጡት የሚያጠቡ የልጅ እናቶች ::

የገንዘብ ጉዳት:- በዚህ ጥናት መሳተፍ ምንም አይነት ጉዳት የለውም::

ጥቅማ ጥቅም:- በዚህ ጥናት መሳተፍ ምንም አይነት ገንዘብ አያስገኝም:: ነገር ግን በዚህ ጥናት ውስጥ እናቶች በሚያጠቡበት ጊዜ ስለአመጋገባቸው እውቀት ያገኛሉ ወይም ያሰዎትን እውቀት ያዳብራሉ::

ስለዚህ የተወሰኑ ጥያቄዎችን ልጠይቅዎት እወዳለሁ:: የእርስዎ በእውነት ሲይ የተመሰረተመልስ ስዚህ ጥናት መሳካት አስተዋፅኦ ያደርጋል::እርስዎ የሚሰጡት መረጃ ከአጥኚውና ቃሰ መጠይቅ አድራጊው በስተቀር በማንኛውም መልኩ ስሌላ 3ኛ ወገን ተሳሌፎ አይሰጥም:: በሙሉ ፈቃደኝነት እንዲሳተፉ እየጠየቅሁ ያስመሳተፍ ወይም በማንኛውም ጊዜ ራስዎን ከጥናቱ የማግለል ሙሉ መብት አለዎት:: ማንኛውም ጥያቄ ካለዎት በሚከተለው አድራሻዬ ማግኘት ይችላሉ::

ሳምራዊት መሳከ

ስ.ቁ.0902724863

ኢ.ሜይል:samryemelaku@gmail.com

## Annexes 5.የስምምነት መግለጫ ፎርም - በአማርኛ

ባህር ዳር ዩኒቨርሲቲ

ህክምናና ጤና ሳይንስ ኮሌጅ

ስለ ምግብ እና ስነ ህዝብ ትምህርት ክፍል

ድህረ ምረቃ ፕሮግራም

እኔ ስሜ ከዚህ በታች የተገለጸው፣ የዚህ ጥናት ዓላማ በደንብ የተብራራልኝ ሲሆን የጥናቱንም ዓላማ ተረድቻለሁ።

በዚህ ጥናት ላይ መሳተፍ በሙሉ ፈቃደኝነት ላይ የተመሰረተ መሆኑን በሚገባ የተረዳሁ ሲሆን በማንኛውም ጊዜ ከጥናቱ ራሴን የማግለል መብት እንዳለኝ አውቄአለሁ። ስለሆነም የምሰጠው መረጃ በምስጢር እስከተጠበቀ ድረስ በዚህ ጥናት ለመሳተፍ ተስማምቻለሁ። በዚህ ጥናት ለመሳተፍ ስምምነቴን ስገልፅ ስምጠየቀው ጥያቄ በእውነት ላይ የመሰረተ መልስ ለመስጠት የተስማማሁ መሆኔን አረጋግጣለሁ።

የመረጃ ሰጪው ፊርማ \_\_\_\_\_ ቀን \_\_\_\_\_

የአጥኚው ፊርማ \_\_\_\_\_ ቀን \_\_\_\_\_

**Annexes 6.መጠይቅ - አማርኛ ቅጽ**

የጥያቄው መስደ ቁጥር.....

የመረጃ ሰብሳቢውስም-----

የመረጃ ሰጭው መስደ ቁጥር-----

ስቃስ መጠይቅ የሚያስተምርበት መንገድ - ስጥያቄዎች አማራጭ ነገሮችን በመጠቀም ምሳሌዎችን ይከፋፍሉ እና ስተሰጠው ጥያቄ በተሰጠው ክፍትቦታ ላይ ይጻፉ.

የልጆቻቸው እድሜ ከ6 ሳምንት እስከ 24 ወራት የሆኑ የልጅ እናቶች ከመጠን በላይ ውፍረት ምዘናና ተዛማጅ ችግሮች በባህር ዳር ከተማ ባሉ ቀበሌዎች የዳሰሳ ጥናት፣በባህር ዳር 2011ዓ.ም

**ክፍልአንድ:-የእናቶች ኢኮኖሚያዊ እና ስነ-ሕዝባዊ ባህርያትጥያቄዎች**

- 101. የእርስዎ ሰድሜ ስንት ነው?
- 102. ሃይማኖትዎ ምንድን ነው? ሀ. ትርቶዶክስ ስ. መስሊም ሐ. ፕሮቴስታንት መ. ሴሳካስ ( ይጠቀስ) --
- 103. ብሔርዎ ምንድን ነው? ሀ. አማራ ስ. ትሮሞ ሐ. ትግሬ መ. አገው ሠ. ሴሳካስ (ይጠቀስ).....
- 104. የትምህርት ደረጃዎ? 1.አንደኛ ደረጃ 2. ሁለተኛ ደረጃ 3. ኮሌጅ እና ከዚያ በላይ
- 105. የጋብቻ ሁኔታዎ? 1.ያላገባች 2.ያገባች 3. የሞተባት 4. የፈታች
- 106. የስራ ዘርፈዎ ምንድን ነው? 1.ተቀጣሪ (የመንግስት) 2. የግል ሥራ 3.የቀን ሰራተኛ 4.የቤት አመቤት 5. ነጋዴ
- 107. የወር ገቢዎ ስንት ነው?.....
- 108. የቤተሰባችሁ መጠን ምን ያክል ነው?.....

**ክፍል 2. የሥነ-ምግብ መሰኪያዎች**

- 201. ክብደት-----ኪግ
- 202. ቁመት-----ሳሜ
- 203. ክብደት/ በቁመት ሰኩዩር -----

**ክፍል 3. የወሲድና ጤናን በተመለከተ**

- 301. የአሁኑ ልጅሽ ሥንተኛሽ ነው? .....
- 302. ልጅዎን እንዴት ነበር የወሰዱት? 1. በማማጥ 2. በቀዶ ጥገና  
የአካል ብቃት እንቅስቃሴ ጥያቄዎች
- 303. ሥራዎ ቶሎ ቶሎ የልብ ምትና የአተነፋፊስ ሥርዓትን የሚያፈጥን ወይም ጠንካራ ስራዎችን (ሰምሳሌ ከባድ ከባድ ሸክሞችን መሸከም ወይም ማንሳት፣መቅፈር ወይም የግንባታ ስራን፣ሴሎችም የሥራ አይቶች ካሉ ይጠቀሱ....?) በቀጣይነት ቢያንስ ስ10 ደቂቃዎች ያስማቂረጥ ሰርተዋል? 1.አዎ 2.የለም (የለምከሆነወደ 307 ይሂዱ).....



- 304. በሳምንት ውስጥ ምን ያህል ቀናትን ሰርተዋል?..... ቀናት
- 305. በሳምንት ስምን ያህል ጊዜ ሰርተዋል? -----ሰዓት / ደቂቃ
- 306. ሥራዎ በመጠኑ የአተነፋፊስ እና የልብ ምት ሥርዓትን የሚያፈጥን ወይም መካከለኛ ስራዎች ስምሳሌ ቀላል ሽክም መሸከምን እና ሌሎችም ተመሳሳይ የሥራ አይነቶች ካሉ ይጠቀሱ...? ቢያንስ 10 ደቂቃዎች ያስማቁረጥ ሰርተዋል? 1. አዎ 2. የሰም
- 307. በሳምንት ውስጥ ምን ያህል ቀናትን ሰርተዋል?----ቀናት
- 308. በሳምንት ስምን ያህል ጊዜ ሰርተዋል?-----ሰዓት / ደቂቃ
- 309. ወደ ቦታዎች ስመንዝ እና ስመሄድ (ወደ ሱቅ፣ ገቢያ፣ ወደ ስራ ቦታ...) ያስማቁረጥ ቢያንስ ስ10 ደቂቃዎች ይጓዛሉ? 1. አዎ 2. የሰም (የሰም ክሊፕ ወደ 313 ይሂዱ)
- 310. በሳምንት ውስጥ ምን ያህል ቀናትን ይጓዛሉ?----ቀናት/ሆሳታት
- 311. በሳምንት ስምን ያህል ጊዜ ይጓዛሉ? -----ሰዓት / ደቂቃ
- 312. ቶሎ ቶሎ የልብ ምትና የአተነፋፊስ ሥርዓትን የሚያፈጥን ወይም ጠንካራ ስፖርት ፣የሕክል ብቃት ወይም የመዘናኛ እንቅስቃሴዎች እንደ [ረጫ ወይም አግር ኪስ ሌሎችም ካሉ ይጠቀሙ...] ቢያንስ ስ 10 ደቂቃዎች ያካሂዳሉ? 1. አዎ 2. የሰም (የሰም ክሊፕ ወደ 316 ይሂዱ)
- 313. በሳምንት ውስጥ ምን ያህል ቀናትን ሰርተዋል?----ቀናት
- 314. በሳምንት ስምን ያህል ጊዜ ሰርተዋል? -----ሰዓት / ደቂቃ
- 315. በመጠኑ የአተነፋፊስ እና የልብ ምት ሥርዓትን የሚያፈጥን ወይም መካከለኛ የስፖርት ፣የሕክል ብቃት ወይም የመዘናኛ (መዘናኛ) እንቅስቃሴዎችን (ስምሳሌ ውሃ ዋና፣ ቦሌቦል...) ቢያንስ ስ 10 ደቂቃዎች ያስማቁረጥ ይሰራሉ? 1. አዎ 2. የሰም (የሰም ክሊፕ ወደ 319 ይሂዱ)
- 316. በሳምንት ውስጥ ምን ያህል ቀናት ሰርተዋል?----ቀናት
- 317. በሳምንት ስምን ያህል ጊዜ ሰርተዋል? -----ሰዓት/ ደቂቃ
- 318. በቀን ስመቀመጥ ወይም ሰማረፍ (በስራ ቦታ፣ በመኪና፣ በማበብ፣ ቴሌቪዥን በማየት...) ምን ያህል ጊዜ ይቀመጣሉ?-----ሰዓት / ደቂቃ

**ክፍል 4.የጡት ማጥባትና የምግብ ሁኔታን በተመለከተ (የምግብ ቡድን ፍጆታ)**

ባለፈው አንድ ቀን ውስጥ በቤት ውስጥ ወይም ከቤት ወጭ የበላሽዉን እና የጠጣሽዉን እያንዳንዱን ምግብና መጠጥ ከቁርስ ጀምሮ ይዘርዘሩ።

ቁርስ	ምሳ	እራት
ተጭማሪ ምግብ	ተጭማሪ ምግብ	ተጭማሪ ምግብ

- 401. ባለፉት 24 ሰዓታት እህል ፣ ነጭ ሥር ምግቦችን ( በቆሎ ፣ ራዝ ፣ ስንዴ ፣ ማሽሳ ፣ ግብስ፣ ዘንጋዳ፣ አጃ፣ ካሳቫ ወይም ማንኛውም ሌሎች እህሎች ወይም ምግቦች (ስምሳሌ ዳቦ ፣ ገንፎ ፣ በነጭ የተጠበሰ ጣፋጭ ድንች ፣ ፓስታ፣መኮረኒ ወይም ሌሎች የእህል ምርቶች...) በስተሻል? 1. አዎ2. አልበላሁም

402. ባስፈት 24 ሰከታት ክክ ዘርቶ (ባቁላ ፣ክተር ፣ምስር ፣ሰውዝ ፣ሱፍ ፣የዳባ ፍሬ...) ሴቶች ወጤቶችን በስተሻል? 1. አዎ 2.አልበላሁም
403. ባስፈት 24 ሰከታት ስጋንና ዓላን (የበሬ፣ አላማ፣ ጥጃ፣ ዶር፣ ገበት፣ኩላሊት፣አላና የአላ ዝርዳዎችን...) በስተሻል?1. አዎ 2.አልበላሁም
404. ባስፈት 24 ሰከታት እንቁላል (የዶር) በስተሻል?1. አዎ 2.አልበላሁም
405. ባስፈት 24 ሰከታት ዘር (ኦቶሎኒ...) በስተሸነበር? 1. አዎ 2.አልበላሁም
406. ባስፈት 24 ሰከታት ወተት እና የወተት ምርቶች (አይብ፣ እርገ ፣አንትና ሴቶች የወተት ተዋጽኦችን...) በስተሻል?1. አዎ 2.አልበላሁም
407. ባስፈት 24 ሰከታት ሴቶች አትክልቶች (ዳባ ፣ ቲማቲም ፣ አረንጓዴ እና ትኩስ ባቁላ ፣ ክተር ...)ምግቦችን በስተሸነበር?1. አዎ 2.አልበላሁም
408. ባስፈት24ሰከታትጥቁርአረንጓዴቅጠላቅጠሎችንናአትክልቶችን(ቃሪዶ፣ጥቅልገመን፣ሀበሽገመን፣ቅስጥ፣ሰላጥ፣ብሮኮሲ፣ኪዶር ፣ፎሶሲዶ...)በስተሸል?1.አዎ2.አልበላሁም
409. ባስፈት 24 ሰከታት ሴቶች ፍራፍሬዎችን ስምሳሌ(የልበሰሱ ጣፋጩ ድንች ፣ ካርት ፣ ዳባ ፣ አረንጓዴ ፓፓዶ ፣ ሙዝ ፣ ብርቱካን እና ማንጎ...) በስተሸል? 1. አዎ 2.አልበላሁም
410. ባስፈት 24 ሰከታት ሴቶችቫይታሚን ኤ የበሰፀጉ ፍራፍሬዎችና አትክልቶች (የበሰሰ አፕሪኮት ፣ ፒች ፣ ማንጎ ፣ አቦካዶ ፣ ካርት ፣ ፓፓዶ ፣ ጥልቅ ቢጫ ሙዝ እና ብርቱካን) በስተሻል? 1. አዎ 2.አልበላሁም
411. ባስፈት ሰላሳ ቀናት ውስጥ ምግብ በማስቀ ተጭንቀው ነበር? 1. አዎ 2. አልተጭነኩም (የጥያቄ ቁጥር 411መልስ አዎ ከሆነ ወደ ቁጥር 412 ይሂዱ...)
412. ስምን ደክል ጊዜ ነበር? 1.አልፎ አልፎ (<3) 2. አንዳንድ ጊዜ(3-10) 3. በተደጋጋሚ(>10)
413. ባስፈት ሰላሳ ቀናት ውስጥ የተመራጭ ምግቦች አጥረት ነበር? 1.አዎ 2 የሰም. (የጥያቄ ቁጥር 413 መልስ አዎ ከሆነ ወደ ቁጥር 414 ይሂዱ)
414. ስምን ደክል ጊዜ ነበር? 1.አልፎ አልፎ (<3) 2. አንዳንድ ጊዜ (3-10) 3. በተደጋጋሚ(>10)
415. ባስፈት ሰላሳ ቀናት ውስጥ በገንዘብ አጥረት የተነሳ ስተሰዩ ምግብ ዓይነቶች ተመግባው ነበረ? 1.አዎ 2. አልተመገብኩም (የጥያቄ ቁጥር 415 መልስ አዎ ከሆነ ወደ ቁጥር 416 ይሂዱ)
416. ስምን ደክል ጊዜ ነበር?1.አልፎ አልፎ (<3) 2. አንዳንድ ጊዜ (3-10) 3. በተደጋጋሚ(>10)
417. ባስፈት ሰላሳ ቀናት ውስጥ በገንዘብ እጦት ምክንያት ያልፈሰጉትን ምግብ እንድትመገቡ ተገደዋል? 1. አዎ 2. አልተመገብኩም (የጥያቄ ቁጥር 417 መልስ አዎ ከሆነ ወደ ቁጥር 418 ይሂዱ)
418. ስምን ደክል ጊዜ ነበር? 1.አልፎ አልፎ (<3) 2. አንዳንድ ጊዜ (3-10) 3. በተደጋጋሚ(>10)
419. ባስፈት ሰላሳ ቀናት ውስጥ አነስተኛ መጠን ደመገቡ ነበር?1. አዎ 2.አልበላሁም (የጥያቄ ቁጥር 419 መልስ አዎ ከሆነ ወደ ቁጥር 420 ይሂዱ)
420. ስምን ደክል ጊዜ ነበር? 1.አልፎ አልፎ (<3) 2. አንዳንድ ጊዜ (3-10) 3. በተደጋጋሚ(>10)
421. ባስፈት ሰላሳ ቀናት ውስጥ ምግብን ዘለው ያቃሱ? 1. አዎ 2. አላቅም (የጥያቄ ቁጥር 421 መልስ አዎ ከሆነ ወደ ቁጥር 422 ይሂዱ)
422. ስምን ደክል ጊዜ ነበር? 1.አልፎ አልፎ (<3) 2. አንዳንድ ጊዜ (3-10) 3. በተደጋጋሚ(>10)

423. ባስፉት ሰላሳ ቀናት ውስጥ በቤት ውስጥ ምግብ አልቆ ነበር? 1. አዎ 2. አሳስቀም ((የጥያቄ ቁጥር 423 መልስ አዎ ከሆነ ወደ ቁጥር 424 ይሂዱ)
424. ሰዎን ያክል ጊዜ ነበር? 1.አልፎ አልፎ (<3) 2. አንዳንድ ጊዜ (3-10) 3. በተደጋጋሚ(>10)
425. ባስፉት ሰላሳ ቀናት ውስጥ አየራብዎት ተኝተዋል? 1. አዎ 2. አልተኝሁም (የጥያቄ ቁጥር 425 መልስ አዎ ከሆነ ወደ ቁጥር 426 ይሂዱ)
426. ሰዎን ያክል ጊዜ ነበር? 1.አልፎ አልፎ (<3) 2. አንዳንድ ጊዜ (3-10) 3. በተደጋጋሚ(>10)
427. ባስፉት ሰላሳ ቀናት ውስጥ በ24 ሰዓት ውስጥ ምግብ ሳይበሉ ቆይተዋል? 1.አዎ 2. አልቆየሁም (የጥያቄ ቁጥር 427 መልስ አዎ ከሆነ ወደ ቁጥር 428 ይሂዱ)
428. ሰዎን ያክል ጊዜ ነበር? 1.አልፎ አልፎ (<3) 2. አንዳንድ ጊዜ (3-10) 3. በተደጋጋሚ(>10)
429. በቤተሰብዎ በኩል በአመጋገብ ሰርዓት እንደ ደደረግኻል? 1. አዎ 2. አይደረግክኝም
430. የእሁኑን ልጆዎን ስህንት ወራት በተከታታይ ጡት ብቻ አጥብተኝዋል? 1. ስ 6 ወራት 2. ከ 7-11ወር 3. ከ12 ወር በኋላ

**ክፍል 5. የአካባቢ ጤና አጠባበቅን በተመለከተ**

501. የመጻዳጃ ቤት አይነት ምንድን ነው? 1.ባህሳዊ ጉድጓድ 2. የተሻሻለ ጉድጓድ
502. የደረቅ ቅሻሻ መጣዎ ምንድን ነው? 1. መስክ 1. ድብደባ, 3.ጉድጓድ ውስጥ 4.ማቃጠል
503. የፈሳሽ ቅሻሻ አወጋገድ ምንድን ነው? 1. ሜዳ ሳይ 2. ጉድጓድ ውስጥ 3. ሲሳ ካስ
504. ዋናው የመጠጥ ውኃ ምንጭ ምንድን ነው? 1. ቱቦ/የባንባ ውሃ 2.የጉድጓድ ውሃ

Declaration

**I, the undersigned, MPH in Nutrition declare that this proposal is my original work.**

Name: Samrawit Melaku

Signature: \_\_\_\_\_

Place of submission: public health nutrition, College of medicine and Health Sciences, Bahirdar University.

Date of Submission:

This research proposal submitted for examination with my approval as university advisor.

Evaluator

Name : \_\_\_\_\_

Signature : \_\_\_\_\_

Advisors

Name

Signature

Date

1. \_\_\_\_\_

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2. \_\_\_\_\_

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