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UNDER NUTRITION AND ASSOCIATED FACTORS AMONG ADOLESCENT GIRLS IN LAYARMACHIHO DISTRICT HIGH SCHOOLS, NORTH WEST, ETHIOPIA

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UNDER NUTRITION AND ASSOCIATED FACTORS AMONG ADOLESCENT GIRLS IN LAYARMACHIHO DISTRICT HIGH SCHOOLS, NORTH WEST, ETHIOPIA

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DECLARATION

This is certifying that this thesis entitled under nutrition and Associated Factors among Adolescent Girls in layarmachiho District High Schools, Northwest, and Ethiopia. Thesis Submitted in partially fulfillment of the requirements for the degree of Master of Science in applied human nutrition to graduate program of collage of Bahrdar Institute of technology, Bahirdar University by Alemtsehay Taye and ID.NO.BDU Msc (sum) 002/2007.

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Place: Bahir Dar

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ABSTRACT

BACKGROUND: The age of adolescent is a phase of growth and development in the life process that need adequate and proper quality food to meet the nutrient requirement for their physical and mental growth and also development of reproductive maturity. Need of food during adolescence are influenced by the puberty age connected with increased growth rate and changes in body composition.

OBJECTIVE: The objective of this study was to asses under nutrition of adolescent girls and associated factors in Lay armachiho district high schools, Northwest, Ethiopia, 2018.

METHOD: Institutional based cross sectional study was conducted from February to March to assess under nutrition and associated factors in adolescent. The sample size was calculated based on the single proportion formula using the prevalence of height for age in adolescents 31.5%. The final sample size was 366 adolescent girls. The data were collected by using structured questionnaire and Anthropometric measurement and the study employed systematic sampling technique to select adolescents. Data was entered in to Epi and transferred to SPSS for analysis. WHO Anthroplus software was used to calculate BMI for age z-score and height for age z-score. The data would be analyzed using bivariate and multivariate logistic regression. The degree of association between dependent and independent variables was assessed using odds ratio with 95 % confidence interval and variables with p-value ≤ 0.05 are considered significant.

Result. The prevalence of wasting and stunting was 10.4 % and 23.2 % respectively. Family size [AOR = 0.45 (0.21, 0.93), dietary histories [AOR = 2.1 (1.02, 4.31)] and water source [AOR 0. 39 (0.19, 0.84)] were significantly associated with wasting whereas meal frequency [AOR = 2.2 (1.27, 3.81)], marital status [AOR = 2.19 (1.21, 3.97)], residence [AOR = 1.87 (1.08, 3.23)] and disease histories [AOR = 1.78 (1.06, 2.98)] were significantly associated with stunting.

Conclusion and Recommendation: wasting and stunting problems are found among adolescent girls in Layarmachiho district high schools. District health office provides strategies to improve the nutritional status of girls and given much attention.

Key words: under nutrition, Risk Factors, Adolescents Girls.

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LIST OF ABBREVIATIONS /ACRONYMS

AOR   Adjusted Odd Ratio

BMI   Body Mass Index

COR   Crude Odd Ratio

DDS   Dietary Diversity Score

DD   Dietary Diversification

EDHS   Ethiopia Demographic and Health Survey

SCN   Standing Commission of Nutrition

SD   Standard Deviation

SPSS   Statistical Package for Social Science

WHO   World Health Organization

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1. INTRODUCTION

1.1. Background of the study

Adolescence is a powerful anabolic period when requirement for all nutrients increases. According to WHO Adolescents age include 10–19 years (WHO, 2005). They are under the physiological, cognitive and psychosocial changes but remain neglected from many health and nutrition services [SCN, 2005]. Hormones set with this development program together with social structure aimed to control the shift from childhood to adulthood. Age of adolescent classified in to three distinct stages based on the features of biologic, psychological and social matters: early (11-13), middle (14-16) and late (17-19) (Kleigman, and Jenson, (2004). It account 20% of the global population and with approximately 80% of them live in developing countries (WHO, 2005).In Ethiopia adolescent account 25% population (Central agency stastics ,2007).

This age is a phase of growth and development in the life process that need adequate and proper quality food to meet the nutrient requirement for their physical and mental growth and also development of reproductive maturity (Patanwar, and Sharma, 2013).Nutritional requests during adolescence are influenced mainly by the puberty age associated with increased growth rate and changes in body composition and organ systems (Stang, and Story, (2005). During this period adolescents accumulate 15% their final adult height, 45% bone mass development and 50% of adult weight is grown together with changes in body shape and composition (Giuseppina et al., (2000)).

Under nutrition is a silent disaster and it continues to be a chief public health problem worldwide, particularly in South-East Asia and sub-Saharan Africa. Under nutrition is a sign of poor nutrition having a main Consequence on human health as well as for the social and economic development of a population (Black et al., 2003).Some young people lack ample food and others make poor food selections (WHO, 2005). Especially Under-nutrition among adolescents is a thoughtful public health problem internationally, particularly in developing countries (California Nutrition and physical activity guideline for adolescent, 2012). Few studies readings in Africa have used

the WHO Mentioned references to assess under nutrition among adolescents. The prevalence of under nutrition among adolescents is in the range of 4-30%, which poorer than South Asia (Central Statistical Agency [Ethiopia], 2007).

There is lack of information about the nutritional status of adolescents in Ethiopia. Resources have usually focused at young children and pregnant women. So adolescent nutrition is suffering from shortage of data, low policymaker attention in the nutritional problems of adolescents, minute program experience and the shortage of resources-contribute to a serious lost opportunity to strengthen the health, development and economic progress of nations.

1.2. Statement of Problem

Adolescent is a phase of growth and development in the life process that need adequate and proper quality food to meet the nutrient requirement for their physical and mental growth and also development of reproductive maturity (Patanwar, and Sharma, (2013). Therefore appropriate nutrition and healthy eating habits at this age are the basic for good health in adulthood. Under nutrition is an important underlying cause of illness and death in Africa especially among women and young children (Southern Sudan Medical Journal, 2007). The high rate of malnutrition in girls not only contributes to increased morbidity and mortality associated with pregnancy and delivery, but also to increased risk of delivering low birth-weight babies. This contributes to the intergenerational cycle of malnutrition (review of south East Asian countries 2006).

The burden of energy, protein and micronutrient shortages is high in adolescents of developing countries. Many girls in developing countries come into adolescence undernourished, making them more fragile to disease and early death. And also adolescents have a low rate of infection and chronic diseases compared to children under 5 years old and old age that creates them receive little attention except reproductive health. Insufficient diet during this time can result in diminished learning ability, slowed down sexual maturity, lack of attention, diminished school performance and slow growth. Therefore malnourished adolescent girls are at threat of being stunted mothers who are likely to undergo birth difficulties and to deliver

low birth weight babies that could lead to intergenerational cycle of malnutrition. (Roba et al., 2016). The EDHS 2011 revealed that the proportion of non-pregnant adolescents aged 15-19 years with chronic malnutrition (BMI <18.5) was 36 % (EDHS, 2011). Few Studies in Ethiopia showed that under nutrition was common problem among adolescent girls. From rural communities of Tigray in 2009, northern Ethiopia the prevalence of stunting was 26.5% and wasting was 58.3% (Mulugeta et al., (2009). Other studies in Ethiopia shown that 37.8% were wasted in Tigray region in 2015 (Gebremariam et al., (2015).The Study done among the adolescent school Girls in Adwa town, North Ethiopia 2016 also demonstrate the prevalence of thinness and stunting was 21.4% and 12.2%, respectively (Tsgehana et al., 2016). The study conducted in central Ethiopia at Adama city in 2016 displayed that 21.3% of the adolescents were underweight, (Roba et al.,2016). Depending out the BMI the prevalence of under nutrition was13.68% studied in south east Ethiopia Oromia region bale zone in 2015 (Ahmed et al., 2015). In Amhara region the prevalence of girls with BMI-for-age Z-score < -2 were 13.6 % and height- for-age Z-score < -2 were 31.5 % (Wassie et al., 2015).

The Federal Government of Ethiopia has been running to decrease under nutrition greatly through public education and given that nutritional supplements and financial support to vulnerable families. Still risk factors of under nutrition are diverse. Mostly in Ethiopia there are community centered interventions primarily to prevent malnutrition in women and children but there is tinny effort to address malnutrition in adolescents.

There is limited information and lack of research progress about under nutrition and associated factors in adolescent girls in Ethiopia including selected district. Therefore this study tried to address the gap by assessed under nutrition and associated factors of adolescent girls attending high schools in Lay Armachiho district Northwest, Ethiopia.

1.3. Objectives of the Study

General Objective

The purpose of this study was to measure the magnitude of under nutrition and associated factors among adolescent girls *in Layarmachiho* district high schools, Northwest, Ethiopia.

Specific Objective

- ➢ To determine the magnitude of wasting and stunting among adolescent girls in Layarmachiho district high schools.
- ➢ To identify associated factors of wasting and stunting among adolescent girls in Layarmachiho district high schools.

1.4. Scope of the Study

The scope of this study will be surrounded in Layarmachiho district due to serious problems of under nutrition in adolescent girls of age11-19. The study was focus only adolescent girls to break malnutrition intergenerational cycles of future generation. This study should not include elementary school adolescent girls' age 11-19 and boys from high schools and elementary schools due to time and other source limitation.

1.5. Significance of the study

Under nutrition is commonly spread problem affecting people who are lived in developing countries, particularly rural area of developing countries and low income communities. The problem is mostly widespread in developing countries like Ethiopia. So the adolescent nutrition needs very high attention due to rapid change in growth and development and needs proper amounts of nutrient in large amount. The tomorrow's mothers are the present adolescent girl, therefore nutritional status of adolescents needs high attention to support the future life. It was also serve as reference for other researcher that will conduct a research study on this study area.

2. REVIEW OF LITERATURE

2.1. Magnitude of Under nutrition

A cross-sectional study showed in the Peninsular of Malaysia in 2012 stated that the prevalence of stunted 64 %.(C.Y.Wong et al., (2015). A cross-sectional study among rural adolescents in the West Bengal, India in 2017 revealed 54% of adolescents was stunted and 49% were thin (Amitava et al., 2017). A cross-sectional study revealed in rural Bangladesh in 2010 stated that 26% of the adolescent girls were thin and 32% stunted (Nurul et al., 2010).

In Africa, urban and peri-urban areas of Ouagadougou (Burkina Faso) in 2011 stated that the prevalence of stunting was 8.8% and 13.7% of thinness (Daboné et al. 2011). A study conducted western Kenya in 2005 shown Overall prevalence of stunting and thinness was 12.1% and15.6%, respectively (Leenstra et al., 2005).

The Study done among the adolescent school Girls in Arsi zone Oromia Region, Eastern Ethiopia 2017 demonstrate the prevalence of thinness and stunting was 14.8% and 20.2%, respectively (Yayehyirad et al., 2017).The study conducted in central Ethiopia at Adama city in 2016 displayed that 15.6 % of the adolescents were stunted (Roba et al., 2016). Depending on the BMI the prevalence of under nutrition was 13.68% studied in south east Ethiopia Oromia region bale zone in 2015 (Ahmed et al., 2015).Study conducted on socio-demographic factors associated with stunting among adolescents show16% stunted in Jimma zone, southwest Ethiopia(Huruy.,2015).Other studies in Ethiopia shown that 37.8% were wasted in Tigray region in 2015 (Gebremariam et al.,(2015).The Study done among the adolescent school Girls in Adwa town, North Ethiopia 2016 also Demonstrate the prevalence of thinness and stunting was 21.4% and 12.2%, respectively (Tsgehana et al., 2016).The study done on nutritional status of adolescent girls from rural communities of Tigray ,northern Ethiopia shown 26.5 % stunting and 58.3 % wasting (Mulugeta et al ., 2009).

A community based cross sectional study prepared on Predictors of nutritional status of Ethiopian adolescent girls revealed in Amhara region the prevalence of girls with BMI-for-age Z-score < -2 were 13.6 % and height-for-age Z-score < -2 were 31.5 % (Wassie et al., 2015). Most of the above results indicated that under nutrition is a dominant public health problem in majority of Ethiopian communities.

2.2. Associated Factors with under nutrition

Across-sectional study among rural adolescents in the West Bengal, India in 2016 revealed 54% of adolescents were stunted and 49% were thin. The adolescent's fitted to lower social class, Governmental employed mother and educational status of mother were significantly associated with stunting and thinness (Amitava *et al.*, 2017). A cross sectional survey study conducted western Kenya in 2005 shown age and menstrual histories were significantly associated with stunting and wasting (Leenstra et al., 2005).

The study conducted on Adolescent School Girls Arsi zone Oromia Region, Eastern Ethiopia show 1-2 times meat consumption per week and feeding of meal less than 3 times per day were factors significantly affecting low height for age and menstrual histories and monotonies diet were factors associated with low body mass index for age of adolescent girls(Yayehyirad et al., 2017).The study shown in Adama city for adolescent nutrition 2016 demonstrated born from uneducated parents (father and mother), their fathers occupation of being a merchant, adolescents with low dietary diversity, monotonous diet and adolescents joining government schools are the most associated factors for under nutrition (Roba et al .,2016) . Institution based cross sectional study prepared in Bale zone Oromia region show Dietary factors such as meal frequency, meal skipping and dietary diversity were the associated factor for nutritional status for adolescent girls for under nutrition (Ahamed et al. 2015).Study conducted on socio-demographic factors associated with stunting among adolescents show gender, place of residence, household size, household income, educational status, employment status, type of last school attended and abdominal pain(disease) are associated with stunted in Jimma zone, southwest Ethiopia(Huruy.,2015).Study conducted on Adolescent School Girls in Adwa Town show Age of adolescent, mother's educational status, eating less

than 3 meals per day, having family size >5, were significantly associated with thinness among the adolescent girls. Family size >5, Menstrual status and unimproved source of drinking were significantly associated with stunting (Tsgehana et al., 2016). The study done on nutritional status of adolescent girls from rural communities of Tigray, northern Ethiopia show age and lack of Lateran facilities were significant associated factors for stunting and wasting.(Mulugeta et al.,2009).

A community based cross sectional study prepared on predictors of nutritional status of Ethiopian adolescent girls in Amhara region shown the prevalence of girls with wasting 13.6 % and stunting were 31.5 % with the associated factors age, poor dietary diversity score, using community based nutrition service were factors significantly associated with thinness in adolescent girls and Being on the age, had nutrition and health information, living in food secured households, were factors affecting low height-for-age in study (Wassie et al., 2015).

2.3: Conceptual Frame Work
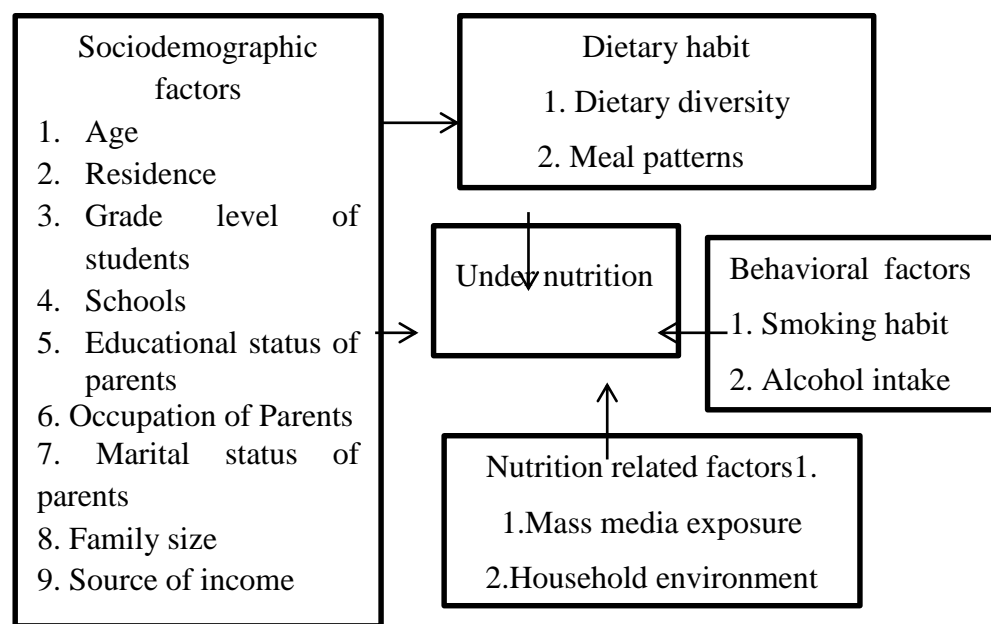
Figure 2:1 Conceptual Frame Work of Associated Factors for under nutrition of Adolescent Girls in Lay Armachiho District, Northwest, Ethiopia, (USA, agency development multi sectorial international nutrition project, 2016).

3. METHODOLOGY AND DESIGN OF THE STUDY

3.1 Study Design

Institutional based cross sectional design was employed to asses under nutrition and associated factors in adolescent girls attending high schools at Layarmachiho District.

3.2. Study Area

The study was conducted in lay armachiho district high schools which are found in the north Gondar zone and the center of district known as *Tikle dengay* town which is located 24 km from Gondar town. In the district there are 59 elementary schools and 3 High Schools .From the three High Schools in 2017GC, 2125 male and 2520 female total 4645 students found (District education office). The district has a total area of 129,272 hectares with 26 *Kebeles* and the average total population is 140,417 out of these males are 69,506 and females are 70,911(District administration office).The area is tropical high land situated at 1500-2700m above sea level. Almost all *kebeles* are rural and source of income is agriculture. Cereal crops are the most common source of foods. The center of the district has one Health center and Health post. The study was conducted from February to march, 2018.

3.3. Population

3.3.1. Source of Population

All adolescent girls age (11-19) attending high schools in the Layarmachiho district was the source population.

3.3.2. Study Population

All selected adolescent girls age (11-19) attending their secondary education in the selected high school of Layarmachiho district was considered as the study population.

3.4. Inclusion and Exclusion Criteria

3.4.1. Inclusion Criteria

Adolescent girls who are in the age of (11-19) years attending high schools in the Layarmachiho district were included in the study.

3.4.2. Exclusion Criteria

Adolescent girls who have abnormal spinal curvature.

3.5. Sample Size Determination

A single population proportion formula was used to determine the sample size. Prevalence of stunting and thinness in adolescents girls were 31.5% and 13.6% respectively (Wassie et al., 2015), Confidence level of 95 %, 5% margin error used.

$$n = (z\alpha/2)^2 p (1-p)/d^2$$

Table 2:1 Sample Size Determination

Specific	Assumption					
	p	d	Z	n	n_{total}	Reference
Objective1(stunting)	0.315	0.05	1.96	332	366	Wassie,*et al.*,2015
Objective2(wasting)	0.136	0.05	1.96	181	199	Wassie,*et al.*,2015

$n_{total}=$ total sample size after adding 10% non-response rate, comparing two objectives 366 is taken as final sample size.

3.6. Sampling Technique/Procedure

The study was conducted in Layarmachiho district high schools adolescent girls. From the three governmental High Schools, one is secondary School (9-10) and two Preparatory and Secondary Schools (9-12). Total number of female students were identify through viewing registers in the district education office and director office of each school.

A proportional allocation formula was used to estimate the total number of participants each school. Final samples were drawn using systematic sampling technique. Selection of female students from the three high schools of each grade level (9, 10, 11, and 12) was done by the following allocation proportionate formula.

$$ni = \frac{n * Ni}{N}$$

Where ni = is sample size required by each schools

n= total sample size needed for the study.

Ni= total female students of each high schools.

N= $N_1+N_2+N_3$ is the total female students in the three high school.

Lay armachiho district

Total- 3-high schools, total students 4645, total Female 2520

Woyinochi high schools=665female Selected 96

Chachikuna high schools=95 female, selected 14

Limatberpreparatory& highschools=1760 female selected 256

G. 9= 324 slct =47

G. 10= 214 slct= 31

G. 11= 71 Slct = 10

G. 12= 56 slc =8

G. 9= 39 slc t= 6

G. 10= 56 Slct = 8

G. 9= 791 Slct 115

G. 10= 473 Slct =69

G. 11= 304 Slct = 44

G. 12 = 192 Slc t= 28

366

Figure 3:1 Sampling Procedure

3.7. Study Variable

3.7.1. Dependent Variable

Wasting and stunting among adolescent girls

3.7.2. Independent Variable

1.Socio-demographic factors includes Age, Marital status of parents, Religion, Educational status, Place of residence, Family size, occupational status of parents , school type, grade level of students.

2 .Behavior related characteristics includes alcohol intake, cigarette smoking

3. Dietary factors such as, meal diversity, dietary pattern.

4. Household environment characteristics (water source, toilet availability, garden availability.

5. Medical and Menstrual history.

6. Health and nutrition information characteristics (mass media exposure or not.

3.8. Data Collection Procedure and tools

3.8.1 Data Collection Tools

A structured interview and pretested questionnaire designed by reviewing EDHS report and different literatures were used to collect data. The questioner include socio-demographic characters, nutritional status, behavior related characteristics, household environment, health and nutrition information characteristics, medical and menstrual history. The questionnaire was organizing first in English and then converts to Amharic by high school language teachers.

3.8.2. Data Collection Procedure

The data were collected using interview administer questioner and anthropometric measurement. There are two data collectors who were *biology teachers* and one BSc nurse as supervisor. Two days training was given to data collectors on how to collect data including interview, fill questionnaire and how to make anthropometric measurements, pre-test of questionnaires and data entry issue. The questionnaire

was pretested in related site out of sample schools by take 5% of total sample size and comments and suggestion identify in the pretest was incorporate in the final description. Anthropometric measurement was used to measure weight and height of adolescent girls. Height was measured once with a Portable Height Scale to the nearest 0.1 cm. The subject should take out her shoes, stand straightforward and looking straight in a vertical plane with feet together and knees straight. The heels, buttocks, shoulder blades and the back of the head touch against the barrier. Body weight was measure using the platform weighing Scale to the nearest 0.1 kg that has the ability to measure 0-140 kg. The scale pointer was adjusted at zero before take measurement. Subjects were informed to take off shoes and heavy closes.

The standardized dietary diversity tool with 24-hrs recall was used to assess the dietary intake of adolescent girls. Adolescent girls were interviewed to list the food items they consume the previous 24 hrs, earlier the date of study. Then it was grouped in to nine different food groups. The food items are grains or other starchy roots and tubers, Vitamin A rich fruits and vegetables, Dark Green Leafy Vegetables, Organ Meat, Flesh foods, other fruits and vegetables, Legumes and nuts, egg and diary product. Dietary diversity score of adolescents was measured to indicate poor score < 4 food groups, medium score 4-5 and high score for ≥ 6 food group.

3.8.3 Data Quality Control

Qualities of data were maintained by training the data collectors and supervisors. Pretest was done on 5 % (18.3) of the questioner. The completeness of the questionnaire was checked before data entry every day. Anthropometric measurements of subjects done by trained data collectors using standard procedures (The WHO growth reference). Dietary diversity information was collected by asking the adolescent girls consumed a particular type of food in the previous 24 hrs.

3.8.4. Method of Data Analysis

The Data was first entered into EPI-INFO and transferred to SPSS after collected information. Then the data analysis was done by using SPSS Version20 and WHO Anthroplus software .Descriptive statistics used to show description of the results. Anthropometric measurement was converted in to height for age Z- score and BMI

for age Z- score using WHO Anthroplus software. Then nutritional status of respondents were classified as stunted (HAZ <-2SD) and wasting (BAZ-2SD).Binary logistic regression analysis was done to identify factors associated with under nutrition. Bivariate analysis was done and variables with p- value < 0.2 were passed to multivariate logistic regression analysis in order to show the predictors of under nutrition. An Odds Ratio with a 95% Confidence Interval was used to show the strength of association. Finally, significance was stated at $p \leq 0.05$.

3.9. Ethical Consideration

Ethical clearance was gain from Bahirdar Energy center, Department of Applied Human Nutrition Bahir Dar University. Formal letter was gain from Department of Applied Human Nutrition Bahir Dar University. The allowed letter was written to Layarmachiho woreda education office, all secondary schools and concerned bodies in the district.

After receiving permission from the schools, the principal investigator set dates and times of data collections. Students and their parents were informed and description was given about the purposes, the procedure and all the confidentiality issues. Participants also reported to that participation was done on voluntary basis and that they could withdraw at any time if they are not happy. Names or personal identifiers should not include in the data to maintain participant's confidentiality.

3.10. Dissemination of result

The final result was presented as partial fulfillment of the degree of Master of public health to department of applied human nutrition.

3.11. Operational Definition

Good dietary diversity…… …………… Adolescent girls with dietary diversity score of the median and above the median values (≥4 food groups) from nine food group.

Improved water source………….. Including like tap water, public tap and protected well.

High mass media exposure……................. Adolescent girls who had listened radio or watched television or read newspaper/magazines at least once a week.

Improved toilet……………….Include flush toilet and pit toilet with slab.

4. RESULT AND DISCUSSION

4.1 Result

4.1.1 Socio-demographic Characteristics of Study Participant

The mean age of the study participants was 16.8 years (16.8 ± 1.33 SD) range from 14 to 19 years. From a total of 366 samples, 156 (42 .6 %) were aged between (14 – 16) years and majority of them 210 (57.4 %) were aged between 17-19 years. About 144(39.3%) were living in urban area while 222(60.7%) were living in rural area. About 14 (3.8%) were Muslims, 7(2%) were protestant and 345(94.2%) were orthodox by religion. Majority of them 276 (75.4%) were grade 9-10 while 90 (24.6%) were grade 11-12. In terms of educational status of respondents' father showed 253 (69.1%) were unable to write & read, 52 (14.2 %) were able to read and write, 25(6.8%) were primary school, 13 (3.6%) were secondary school educated and 23(6.3 %) were collage and above. The occupational distribution of the students' fathers showed that 48(13 %) were Governmental employee, 286 (78 %) were farmers, 11 (3 %) were daily laboure, 21 (6%) were merchants. Educational status of the students' mother showed that almost half of the respondents were188 (51.4 %) were unable to write & read, 129 (35.2 %) were able to read and write, 18(4.9 %) were primary school educated, 13 (3.6%) were secondary school educated and 18 (4.9 %) were collage and above. The occupational distribution of the students' mothers showed that 26 (7 %) were Governmental employee, 323 (88.3 %) were house wife, 16 (4.4 %) were daily laboure, 1 (0.3 %) were merchants. About 194(53 %) of the students were living in the family size < 5 and 172 (47 %) of students were living a family size ≥ 5. About 291 (79.5 %) parents of the participants were married whereas 75 (20.5 %) were divorced as shown (Table, 4:1)

Table 4:1 Socio-demographic Characteristics of Study Participants in Lay Armachiho District, Northwest, Ethiopia, 2018.

variable	categories	Frequency	%				
					workers		
					Merchant	21	6
Age	14-16	156	42.6	Educational status of mother	Unable to read &write	188	51.4
	17-19	210	57.4		Read &write	129	35.2
Residence	urban	144	39.3		Primary school	18	4.9
	rural	222	60.7		Secondary school	13	3.6
Religion	Orthodox	345	94.2				
	Muslims	14	3.8		Collage & above	18	4.9
	protestant	7	2				
Grade level of students	9-10 section	276	75.4	Occupation of mother	House wife	323	88.3
	11-12section	90	24.6		Governmental employee	26	7
Educational status of father	Unable to read &write	253	69.1				
	Read &write	52	14.2		Dailylabouer	16	4.4
	Primary school	25	6.8		Merchant	1	0.3
	Secondary school	13	3.6	Marital status of parents	Married	291	79.5
					Divorced	75	20.5
	Collage & above	23	6.3	Family size	>=5	172	47
					< 5	194	53
Occupation of father	Farmer	286	78	Source income of parents	Trade	23	6.3
	Governmental employee	48	13		Agriculture	292	79.8
	Daily	11	3		Employment	51	13.9

4.1.2. Eating Habit of Study Participant

In terms of 24 recall times 246(67.2 %) ate their breakfast and 120 (32.8 %) did not eat their breakfast, 313(85.5%) eat their lunch and 53(14.5%) didn᾽t, 241(65.8 %) eat snack and 125(34.2 %) didn᾽t while 323(88.3%) eat dinner and 43(11.7%) didn᾽t eat as shown (Figure, 4:1).
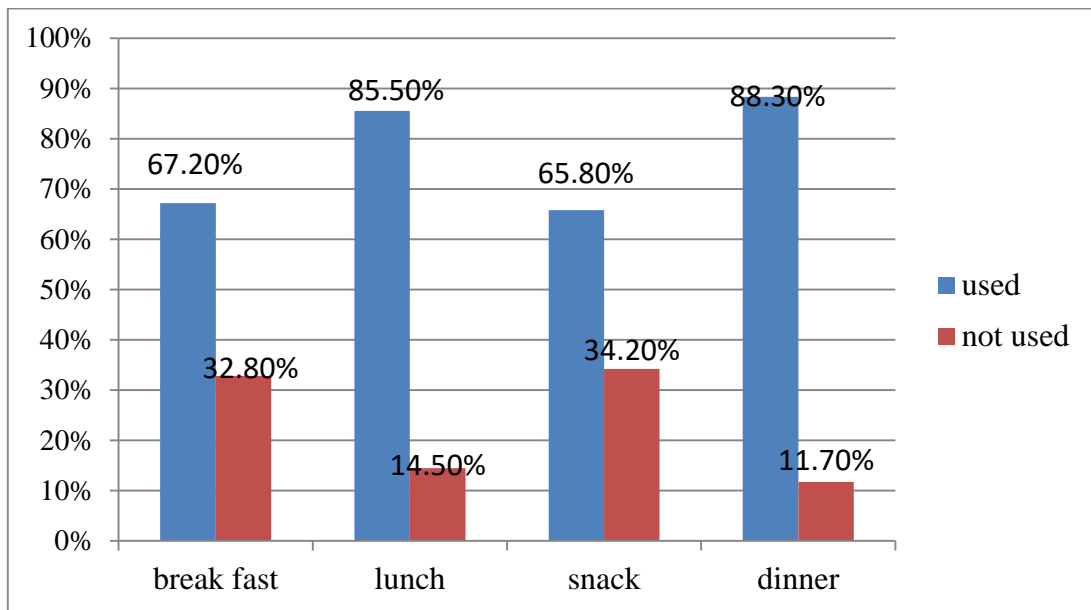
Figure 4:1 Eating Habit of Adolescent Girls in Lay Armachiho District, Northwest, Ethiopia, 2018

4.1.3. Meal Patterns of Study Participants

Most of the adolescents 256 (69.9 %) had a frequency of meal ≥ 3 times per day and 110 (30.1 %) had a frequency ≤ 3 per day. About 201 (55 %) of the students were skipped their regular meals in the previous weeks due to Shortage of food 18 (4.9 %), lack of appetite 86 (23.5%) and 97 (26.5 %) sickness. One hundred seventy nine 179(48.9) respondents ate their food separately and 187 (51.1 %) ate their food together with parents. About 165 (45.1%) ate left over foods while more than half 201(54.9 %) ate fresh foods as shown (Table, 4:2).

Table 4:2 Dietary Practices of Adolescent Girls in Lay Armachiho District, Northwest, Ethiopia, 2018

Variable	Categories	Frequency	%
Frequency of eating per day	< 3 times	110	30.1
	≥ 3 times	256	69.9
Type of meal, you usually eat	Break fast	76	20.8
	Lunch	243	66.4
	Dinner	47	12.8
Did you have to skip any regular meals in the previous week?	Yes	201	54.9
	No	165	45.1
Reason to skip regular meals in the previous week	Shortage of food	18	4.9
	Lack of appetite	86	23.5
	Sickness	97	26.5
Times to skip regular meals	< 3 times	140	38.3
	3-5 times	57	15.6
	>5 times	4	1
Do all family members eat together?	Yes	187	51.1
	No	179	48.9
Who is first served?	Mother & father	2	0.5
	father	1	0.3
	Children	176	48.1
From the children who is first served?	Female	7	1.9
	Male	19	5.2
	Together	150	41
What type of food do you eat?	Fresh	201	54.9
	left over	165	45.1

4.1.4 Dietary Diversity of Study Participants

Based on dietary diversity history 141(38.5%) were classified under poor dietary diversification (consumed <4 food item out of 9) and 225(61.5%) were good dietary diversification (consumed ≥ 4 food items out of 9 food groups) and dietary diversity score information indicate 141(38.5%) were poor (0-3) score, 100(27.3%) were medium (4-5) score and 125 (34.2%) were high (>=6) score as shown (Figure, 4:2).
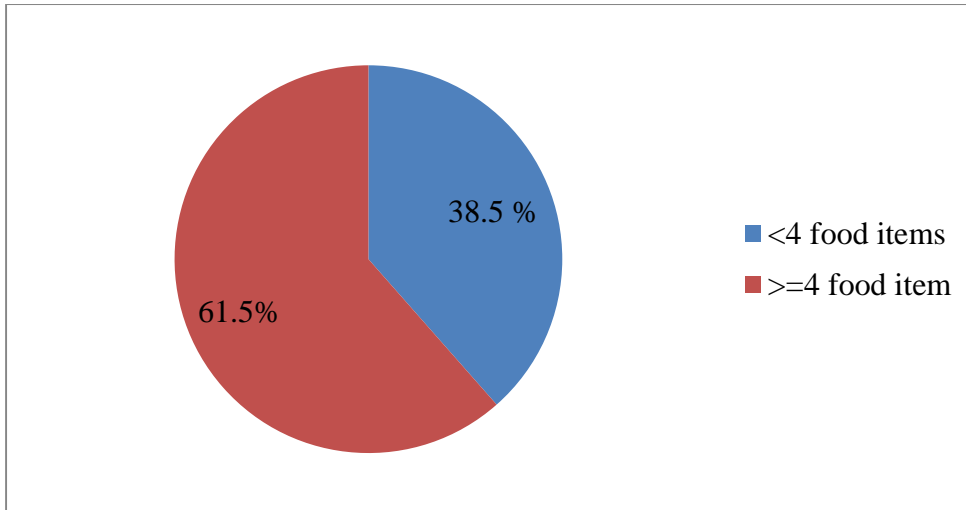
Figure 4:2 Dietary Diversity of respondents in Lay Armachiho District, Northwest, Ethiopia, 2018

4.1.5. Households environmental characteristics of study participant

From the total of 366 respondent 204 (55.7%) used drinking water from improved source and 162 (44.3 %) utilized unimproved water source. Respondents were made safe their drinking water using boiling were 83 (22.1%), using clothes were 11(3%) and chemicals were 111(30.1%) and 49(13.3%) were not done any technique due to lack of knowledge. About 112 (30.6 %) did not safe water due to lack of money and time 32(8.7%) and 80 (21.9 %) respectively. About 185 (50.5%) and 210 (57.4%) of the study subjects reported that home gardening and toilet were available in their home, respectively. Out of one hundred eighty- five, 80(21.9%) were grown fruit, 31(8.5%) were grown vegetable and 74(20.2%) were grown both fruit and vegetable for the purpose of home consumption 95(26%), sales 13 (3.5%) and both home consumption and sales 77(21 %).Out of two hundred ten, 176 (48.1 %) had improved toilet and 34(9.3%) had unimproved toilet kind. Out of one hundred fifty six, 135(36.9 %) used open field and 21 (5.7 %) used public toilet. During the last two week 144 (39.3%) were washed their hand with soup for < 5 days while 222 (60.7 %) were washed their hand for 5 ≥ days as shown (Table, 4:3).

Table 4:3 Household Environment Characteristics of Adolescent Girls in Lay Armachiho District Northwest, Ethiopia, 2018

Variable	Categories	Frequency	%
Source of water	Improve	204	55.7
	Unimproved	162	44.3
Do you do to make water safe?	Yes	205	56
	No	112	30.6
	Do not know	49	13.4
Method to safe water for drink	Boiling	83	22.6
	Chemicals	111	30.3
	Using clothes	11	3.1
Why you do not treat water?	Not enough time	80	21.9
	Not enough money	32	8.7
Do you have home garden?	Yes	185	50.5
	No	181	49.5
What do you grow on it?	Fruit	80	21.9
	Vegetable	31	8.5
	Fruit and vegetable	74	20.2
purpose of vegetable	home consumption	95	26
	For sales	13	3.6
	For sales& home	77	21
Do you have toilet in your home?	Yes	210	57.4
	No	156	42.6
kind of toilet facility	Improve	176	48.1
	Unimproved	34	9.3
Where do you use toilet?	Open field	135	36.9
	Public toilet	21	5.7
Last week, times bath with soup?	<5 times	144	39.3
	≥5 times	222	60.7

4.1.5. Health and nutrition information and menstrual histories of study participant

From the total of 366 respondent 170(46.4%) have information on nutrition and 196(53.6%) have no information on nutrition. From those who have information on nutrition, 92(25.1%) have got information from radio, 78 (21.3 %) were from TV for 1-3 days 116(31.7 %), 21 (5.7%) for 3-5 days and 33 (9 %) > 5 days. Among the adolescents about 136 (37.2%) experienced disease in the last two weeks and majority 230 (62.8 %) were not exposed with disease in the last two weeks. In the menstrual history majority 298 (81.4%) had begun at the age of <12yrs 16(4.6%), 12-14yrs 197 (53.8%) and >15yrs 85(23.2%) while few 68(18.6%) had not started as shown (Table 4:4).

Table 4:4 Health and Nutrition Information and Menstrual Histories of Adolescent's Girls in Lay Armachiho District, Northwest, Ethiopia, 2018.

Variable	categories	Frequency	%
Do you attend mass media?	Yes	170	46.4
	No	196	53.6
kind of mass media	Radio	92	25.1
	television	78	21.3
Time attend mass media	1-3times	116	31.9
	3-5times	21	5.7
	>5times	33	9
Do you suffer from disease in the last week?	Yes	136	37.2
	No	230	62.8
Disease you had in the last week	Respiratory infection	41	11.2
	Diarrhea/vomit	51	13.9
	Ear infections	44	12.1
Time illness stay	< 3days	55	15.1
	3-5 days	30	8.2
	>5days	51	13.9
Have you begun menstruation?	Yes	298	81.4
	NO	68	18.6
Age you see your first menstruation?	<12yrs	16	4.6
	12-14yrs	197	53.8
	>15yrs	85	23.2
Are you a member of youth association?	Yes	30	8.2
	No	336	91.8

4.1.6. Food items of Study Participants

Among the participants 328 (89.6 %) of them consumed grains or other starchy roots and tubers (staples), followed by other vegetables 279 (76.2 %), vitamin A 203(55.5%), legumes199 (54.4%), green vegetable 185(50.5%) and consumption of animal source were relatively low shown egg 139(38 %), 136(37.2 %) flesh meat, 135(36.9 %) dairy product and organ meat were relatively low that was 99 (27 %) compare to other animal source as shown (Figure, 4:3)
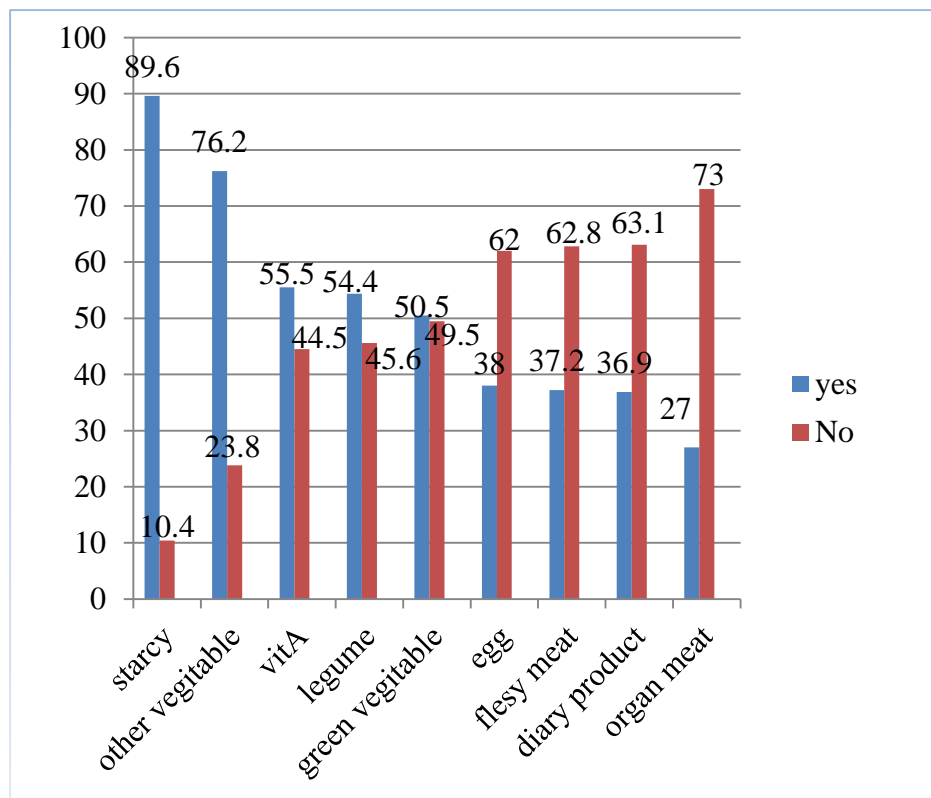
Figure 4:3, 24 hrs Dietary Diversity recalls of Adolescent Girls in Lay Armachiho District, Northwest, Ethiopia, 2018.

4.1.7. Factors Associated with Wasting of Study Participants

Among socio-demographic and economic factors age, religion, residence, marital status, their school, Grade level of students, occupation of their parents, Educational status of their parents and source income of parents were not associated factors at binary logistic regression analysis (p values > 0.2) while skip meals, hand washing practice, family size, source of water and dietary diversity histories were associated factors at binary logistic regression p value (< 0.2) and passed for multivariable logistic regression analysis.

In multivariable logistic regression analysis family size, water source and dietary diversity histories were significantly associated with wasting. Adolescent girls whose family size < 5 were less likely to be wasting compared to those adolescent girls whose family size ≥ 5 (AOR=0.45, 95%, CI: 0.21 - 0.93). Adolescent girls who had low DDS were more likely to be wasting (AOR: 2.1, 95% CI: (1.02, 4.31) than those adolescents girls with high DDS. Adolescent girls who used drinking water from improve water source were less likely to be wasting as compared to adolescent girls who used drinking water from un improve water source (AOR= 0.39, 95% CI: (0.19, 0.84) as shown (Table 4:5).

Table 4:5 Binary and Multivariate Logistic Regression Model of Factors Associated with Wasting among Adolescent's Girls in Lay Armachiho District, Northwest, Ethiopia, 2018

variable	Wasting		COR (95 % Cl)	AOR (95 % Cl)
	yes	No		
Family size				
≥ 5	25	147	0.42 (0.21 ,0.85)*	0.45 (0.21 ,0.93)*
< 5	13	181	1	1
Skip meal				
Yes	26	175	1.89(0.92,3.88)	1.53 (0.72 , 3.25)
No	12	153	1	1
Hand washing practice				
< 5 days/week	21	123	2.06(1.05 ,4.13)	1.7 (0.84 ,3.46)
$\geq$ days /week	17	205	1	1
Dietary Diversity				
< 4	23	118	2.73 (1.37 ,5.43)*	2.1 (1.02 ,4.31)*
≥ 4	15	210	1	1
water source				
improve water source	12	192	1	1
Unimproved water source	26	136	0.33(0.16 ,0.67)*	0.39(0.19,0.84)*

AOR=adjusted odd ratio, COR= crude odd ratio, CI=confidence interval, *= significant associated factors.

4.1.8. Factors associated with stunting of study participant

Among socio-demographic and economic factors residence, marital status ,source income of parents, meal frequency, disease exposed histories and menstrual histories were associated factors at binary logistic regression analysis (p values< 0.2) for stunting. Among those marital status, meal frequency, residence and disease histories were significant at binary logistic regression analysis. In multivariable logistic regression analysis marital status, meal frequency, residence and disease were

significantly associated with stunting. Adolescent girls who came from urban were more likely to develop stunting compared to those who came from rural (AOR=1.87, 95% CI=1.08-3.23). Adolescent girls consumed their diet less than three times per days (AOR=2.2, 95%, CI: 1.27 - 3.81) were more likely to develop stunting than those who consumed more than three times per days. Adolescent girls who came from divorced parents (AOR=2.19, 95% CI=1.21-3.97) were more likely to develop stunting compared to those who came from marriage. Adolescent girls who were exposed with disease last two weeks were more likely to be stunting (AOR: 1.78, 95% CI: (1.06, 2.98) than those adolescents girls did not exposed with disease in the last two weeks as shown (Table,4:6).

Table 4: 6 Binary and Multivariate Logistic Regression Model of Factors Associated with Stunting among Adolescents Girls in Lay Armachiho District, Northwest, Ethiopia, 2018.

variable	Stunting		COR (95 %Cl)	AOR (95 % Cl)
	Yes	No		
Residence				
Urban	42	102	1.71 (1.05 , 2.79)*	1.87 (1.08 , 3.23)*
Rural	43	179	1	1
Marital status				
Divorced	27	48	2.26 (1.3 ,3.93)*	2.19 (1.21 ,3.97)*
Married	58	233	1	1
Meal frequency				
< 3 times /days	33	77	1.68(1.01,2.79)*	2.2 (1.27 ,3.81)*
≥ 3 times /days	52	204	1	1
Source income of parents				
Salary	16	35	1.57(0.82,3.01)	1.42(0.69,2.9)
Agriculture	66	226	3.05(0.79,11.76)	3.36(0.83,13.56)
Trade	3	20	1	1
Disease exposed histories				
Yes	41	95	1.82(1.12 ,2.98)*	1.78(1.06 , 2.98)*
N0	44	186	1	1
Menstrual histories				
Yes	63	235	1	1
N0	22	46	0.56(0.31 ,1.01)	0.59(0.32,1.09)

AOR=adjusted odd ratio, COR= crude odd ratio, CI=confidence interval *= significant associated factors.

4.1.8. Nutritional Status of Adolescent Girls

Wasting (body mass index for age Z score <-2) was observed among 10.4 % respondent, while 23.2 % of them were stunted.
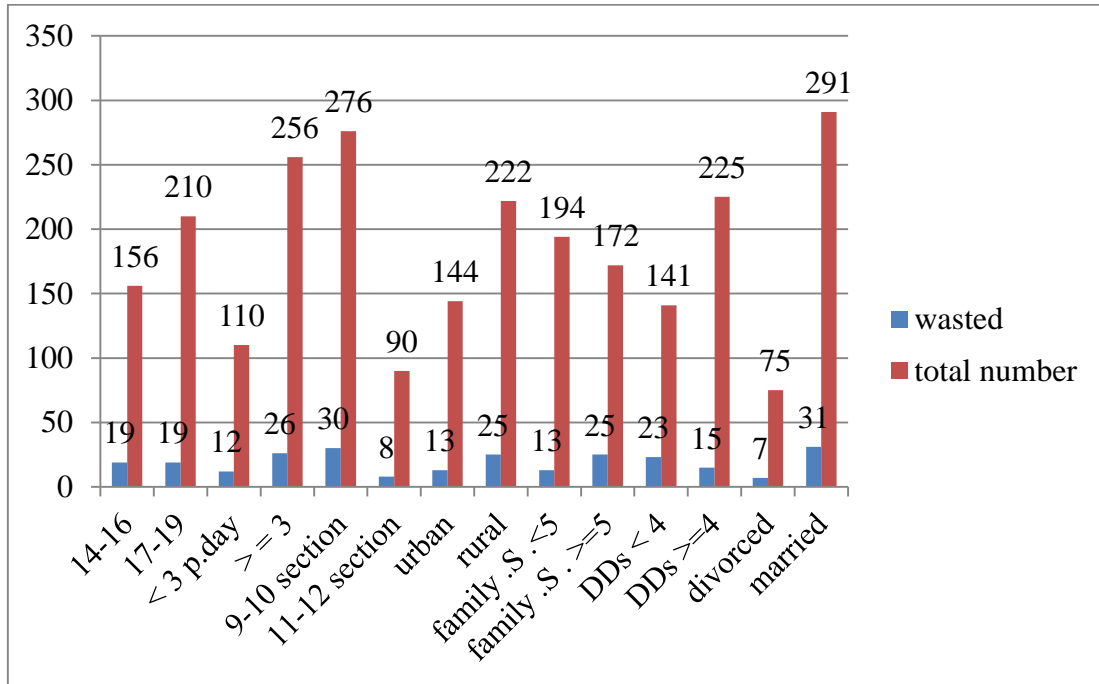
Figure 4:4 Nutritional Statuses of Adolescent Girls in Lay Armachiho District, Northwest, Ethiopia, 2018

4.2 Discussion

This study indicated that (38) 10.4 % of the adolescents were wasted and (85) 23.2 % of them were stunted. The predictors of under-nutrition among adolescent girls were family size, dietary diversity, water source, meal frequency, marital status, disease exposed histories and residence. The result of wasting in this study is lower than the study conducted in West Bengal India 49% thinness (Amitava et al., 2017), 26% thinness in rural Bangladeshi (Nurul et al., 2010), 13% thinness in Ouagadougou (Daboné et al., 2011), 15.6% thinness in Kenya (Leenstra et al., 2005) this might be socio economic factors variation and study setting. In Ethiopia the result of thinness in this study was lower than 37.8% wasted in Tigray region (Gebremariam et al., (2015) , 21.4% thinness in Adwa town(Tsgehana et al., 2016),13.68% thinness in bale zone Oromia region (Ahmed ,Y. et al., 2015),14.8% thinness in Arsi zone Oromia region (Yayehyirad,et al., 2017),13.6 % thinness in Amhara region (Wassie et al., 2015), 14 % thinness in Ethiopia nutrition baseline report (2009/10).

The result of stunting in this study is lower than the study in Malaysia India stunt 64% (C.Y.Wong et al., 2015), 54% stunting in West Bengal India (Amitava et al., 2017), 32% stunting in rural Bangladeshi (Nurul et al., 2010) and 31.5% stunting in Amhara region (Wassie, et al., 2015). The result of stunting in this study is higher than the study in Ouagadougou 8.8% stunting (Daboné et al., 2011), 12.1% stunting in Kenya (Leenstra,et al., 2005), 12.2% stunting in Adwa town (Tsgehana, G. et al., 2016) and 15.6% stunt in Adama city central Ethiopia (Roba et al.,2016) and 20.2 % stunting in Arsi zone Oromia region (Yayehyirad et al.,2017). The result of stunt in this study is similar with the study in Ethiopian nutrition baseline report 23 % stunted (2009 /10). These findings indicated that under-nutrition is a major public health problem in majority of Ethiopian communities including urban and rural adolescents. The cause of prevalence difference might be associated with the socio demographic characteristics of household and some of the research community based while this study is school based.

Adolescent girls whose family size < 5 was 55 % less likely to be thin as compared to those whose family size ≥ 5. This finding is similar with the finding from Adwa town (Tsgehana et al., 2016). This might be due to having less family members which leads to less sharing of available food in respondent house and not cause inadequate

consumption of food to be thin. Adolescent girls whose dietary diversity score < 4 had 2.1 times more likely to be thin as compared to Adolescent girls whose dietary diversity score ≥ 4. This finding is similar with Amhara region (Wassie e t ., 2015), Bale zone Oromia region (Ahmed et al. 2015), Adama city (Roba et al.,2016).This might be due to the fact that poor dietary diversity causes inadequate energy accumulation and lack of other essential nutrient that support growth and development. Adolescent girls who used drinking water from improve water source were 61% less likely to be thin as compared to adolescent girls who used drinking water from unimproved water source. This finding is similar with the finding from Adwa town (Tsgehana et al., 2016). This might be the fact improve water is not the reservoirs of pathogen compare to unimproved water source therefore infection with pathogen reduced and not leads to poor nutritional status.

Adolescent girls whose meal frequency less than three times per day had 2.2 times more likely to be short as compared to Adolescent girls whose meal frequency ≥ 3 times per days. This finding is similar with Bale zone Oromia region (Ahmed et al., 2015), Arsi zone Oromia region (Yayehyirad et al., 2017). This might be linked with skipping meals and causes inadequate intake of food which leads to being short. Adolescent girls who came from urban were 1.87 times more likely to develop stunting compared to those who came from rural. So rural is negatively associated with stunting. This finding is similar with Jimma zone; southwest Ethiopia (huruy et al., 2015). The observed urban-rural difference could be an indication of low access and use of health services in the rural areas as compared with urban areas. Adolescent girls who came from divorced parents were 2.19 times more likely to develop stunting compared to those who came from marriage. This might be linked with low income and difficult to satisfy requirements and also may cause psychological problem. This condition leads poor growth .Adolescent girls who were exposed with disease in the last two weeks were 1.78 more likely to be stunt than those adolescents girls who did not exposed with disease in the last two weeks. This finding is similar with Jimma zone; southwest Ethiopia (huruy et al., 2015). This is the fact that repeated infections leads to weak immunity system and create opportunity to other infections that leads to poor growth.

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

Thinness and stunting problem was found in this study area. Dietary diversity history, water source and family size were significantly associated with thinness among the respondents. Meal frequency per day, marital status, residence and disease exposed histories were significantly associated with stunting among respondents. This result helps to understand the degrees of the problem in the study area.

5.2. Recommendation

Based on the information of the factors that significantly associated with under nutrition of adolescents girls in this study, the following recommendation should be applied.

1. District health office should be refined the community about adolescent feeding Practice and transmit message for each school to established club that can describe about nutritional information.
2. District health office & health extension workers should be strength education on health care benefit in school and community.
3. In general District health office combined with mass media owner to transmit message about adolescent under nutrition and its consequences in the next generation.

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ANNEXES

Annex 1: English Form of Participant's Consent and Information Sheet

Annex 1.1 Information Sheet.

Title of the research project: under nutrition and associated factors among adolescent girls, at l/armachiho district high schools, North West Ethiopia.

Name of the organization: Bahrdar University, Department of Applied Human Nutrition, Bahirdar Energy center.

Sponsor: Self

Introduction

My name is Alemtsehay Taye and training at university of Bahrdar for master degree. I am doing research on adolescent girls' nutritional status. I am going to contribute you information and invite you to be part of this research. Before you agree to be part of the research you can talk to anyone you feel comfortable with about the research. If there is any word that you don't recognize, you can ask me and I will clarify.

Purpose of Research Project: The purpose of this investigation is to assessing factors associated with under nutrition among adolescent girls at L/Armachiho district high schools. The study should help to promote and provide confirmation for the health system and different participants who are working on nutrition, to plan applicable and the most effective nutrition intervention in the study setting and also used as a baseline for subsequent studies.

Procedure: In order to collect the data, we call you to take part in our project. If you are willing, you need to realize and sign the consent form.

Risk/ Discomfort: By participating in this research project you may feel some discomfort especially on sacrifice your time otherwise no risk in participating in this study.

Benefits: If you are participating in this research project, the productivity of the study will have both direct and indirect profit to you, as well as your family and the community at great will get appropriate education and services in the future on nutritional status of adolescent girls.

Incentives: You will not be delivered any payment to take part in this project.

Confidentiality: The information collected from this research project will preserved confidential and information about you that will be collected by this study will be kept in a file, without your name, but a code number assigned to it.

Right to refuse or withdraw:

You have full right to reject from participating in this research.

Persons to contact: If you want to recognize more information you can exchange;

Investigator: ALEMTSEHAY TAYE

University of Bahrdar, Department of Applied Human Nutrition, School of chemical and food engineering,

Phone number, +251918808248, Email address alemtaye01@gmail.com

Annex 1.2- Consent Form

University of Bahir Dar on adolescent under nutrition and associated factors, at Lay Armachiho District high schools, North Gondar, Ethiopia, 2017.

Good mooring/Good afternoon, my name is_____. Iam the supporter of the team for the study guiding by Alemtsehay Taye as partial fulfillment for the requirement of Applied Human Nutrition, under the University of Bahir Dar, Department of Applied Human Nutrition, School of chemical and food engineering

The main target of this study is to assessing factors associated with under nutrition among adolescent girls. Your name will not be written and all the information you will give to me will be kept trustworthy, your participation is voluntary based and you are not obliged to answer any question if you do not want to answer it. If you have any question, you can ask freely at any time. The interview will not take more than 30 minutes.

Do I have your permission to continue? If yes thanks and continue.

Name of the respondent _____

Investigator/Data collector name _____

Signature_____

Code No _____

Date of interview _____

Supervisor name_____ Signature _____

Annex 2: English Form of the Questionnaire.
Part I: Socio Demographic Questions

Name of the school _____ Student's code / Identification number _____ Date of Data of collection_____

S.N	Socio demographic information	Response	code
101	age	1----------------	
102	Residence	1.urbon 2.rural	
103	Grade level of the student	1.9 2.10 3.11 4.12	
104	School type	1.Governmental	
105	Religion	1. Orthodox	
		2. Muslim	
		3. Protista	
106	Educational status of father	1Unable to read and write	
		2.Read And Write	
		3.Primary School9(1-8)	
		4.Secondary School	
		5.College And Above	
107	Occupation of father	1.Governmenta employee	
		2. Farmer	
		3.Daily Labourer	
		4.Merchant	
108	Educational status of mother	1.Unable to read and write	
		2.Read And Write	
		3.Primary School(1-8)	
		4.Secondary School	
		5.College And Above	
109	Occupation of mother	1.Housewife	
		2.Government Employee	
		3.Daily Labourer	
		4.Merchant	
110	Marital status of parents	1. single	
		2. married	
		3. .divorced	
111	Family size	1. < 3 individuals	
		2.3-5 individual	
		3. ≥ 5 individuals	
112	Source of income	1. Employment	
		2.Trade	
		3.Agricalture	

Part II. Meal pattern

	Question	Response	Skip
201	How many times do you eat per day?	1. One times	
		2. Two times	
		3. Three times	
		4 and above	
202	In the past 24 hours did you eat your breakfast?	1.yes	
		2.NO	
203	In the past 24 hours did you eat your lunch?	1.Yes	
		2.No	
204	In the past 24 hours did you eat your snack?	1.Yes	
		2.No	
205	In the past 24 hours did you eat your dinner?	1.Yes	
		2.No	
206	What were the meals you usually Ate?	1.Breakfast	
		2.Lunch	
		3.Dinner	
207	During the previous week, did you have to skip any regular meals any day, That is, breakfast, dinner snack, lunch	1.Yes	If2 skip, to 210
		2.No	
208	Breakfast, lunch or dinner? What were the reasons you had to Skip regular meals on some days during the previous weeks?	1.Shortage Of Food	
		2.Lack of appetite	
		3.Sickness	
209	How many times did you skip the regular meals in the previous week?	1.<3 times	
		2.3-5 times	
		3.> 5 times	
210	Do all family members eat together?	1.Yes	If 1 skip to 213
		2.No	
211	Who is first served?	1.Father 2.mother	
		3.Fatherand mother	
		4. Children	
212	From the children who is first served?	1.Females	
		2. male	
		3. together	
213	What type of food do you eat?	1.Left over	
		2.Fresh food	

Part. 3. Medical history

S.N	Question	Response	skip
301	Did you suffer from any disease in the last two weeks?	1.Yes	If 2,skip ,304
		2.No	
302	What were the diseases you had in the last two weeks?	1.respiratory infection	
		2.diarrhea/vomiting	
		3.ear infections	
		4.Others(specify	
303	For how many days did the illness stay?	1. Less than 3 days	
		2. 3-5 days	
		3. >5 days	
304	During the last week, how many days did you bathe with soap?	Number of days……	

4 .Household environment characteristic

S.N	Question	Response	Skip
401	Where do you get water for drinking?	1.tap water 2.public tab	
		3. Protected well	
		4. Unprotected spring	
		5.unprotected well	
402	Do you do anything to the water to make it safe for drinking?	1.Yes	if2 ,404
		2.No	
		3.Don"t know	if3,405
403	What do you usually do to make the water safer to drink?	1.Boil	
		2.Add water guard	
		3.Strain using cloth	
404	Why you don't treat water?	1.Not enough time	
		2.Not enough money	
405	How long it take to fetch water?	1.< 15 minute 2.15 minute-1hrs 3.more than 1hrs	
406	Do you have home gardening?	1.Yes	If2 skip409
		2.No	

407	What do you grow on it?	1.Fruits	
		2.Vegetables	
		3.Fruits and vegetable	
408	For what purpose do you grow the Vegetable and/or fruits?	1.For home use	
		2.For sale	
		3.For sale & home use	
		4.Other(specify)	
409	Do you have toilet in your home?	1.yes	if2, 411
		2.No	
410	What kind of toilet facility do your households own?	1.Flush toilet	
		2.Pit toilet with slab	
		3.Pit toilet without slab	
411	Where do you use toilet?	1.Openfield	
		2.Public toilet	

5. Health and Nutrition Information Characteristics.

S.N	Question	Response	skip
501	Are you member of any adolescent forum/ association?	1.Yes	If,2 skip,503
		2. No	
502	What are the Services you received from the association? More than one answer is Possible?	1.Hygiene & sickness	
		2.Education on nutrition	
503	Do you attend mass media?	1.Yes	If,2 skip 601
		2.No	
504	What kind of mass media do you?	1. Radio	
		2. Television	
		3. Newspaper	
		4. Magazine	
505	How often do you attend mass media in the last week for at least 1 hour?	1.1-3 times	
		2.3-5 times	
		3.>5 times	

6. Menstruation History

S.N	Question	Response	skip
601	Have you begun menstruation?	1.yes	If2
		2.No	skip 701
602	At what age did you see your first?menstration?	1. < 12 year	
		2. 12-14	
		3. >15 year	
603	For how many days does the menstruation stay ?	1.Less than 3 days	
		2.3-5 day	
		3.6-8 days	

7. Dietary diversity.

No	Questions	Examples	Response
701	Did you eat starchy staple in the past 24 hours?	Corn/maize, rice, wheat, sorghum or other grains or foods made from these	1.Yes
			2.No
702	Did you eat dark green leafy vegetables in the past 24 hours?	Dark green/leafy vegetables like, cabbage spinach, etc. including wild	1.Yes
			2.No
703	Did you eat other vitamin A rich fruits and vegetables in the past 24 hours?	carrots, sweet potatoes,	1.Yes
			2.No
704	Did you eat other fruits and Vegetables in the past 24 hours?	Other vegetables (e.g. Tomato ,onion , garlic) including wild one	1yes
			2.No
705	Did you eat organ meat in the Past 24 hours?	Liver, kidney, heart or other organ meat or blood- based foods	1.yes
			2.No
706	Did you eat flesh meat in the pas24hours?	Beef, pork, goat, chicken	1.yes
			2.No
707	Did you eat eggs in the past 24 hours?	Chicken, guinea fowl or any other egg	1.yes
			2.No
708	Did you eat Legumes/ nuts in the Past24 hours?	Beans, peas, lentils, nuts, seeds or foods made from it	1.yes
			2.No
709	Did you eat dairy products in the past 24 hrs?	Milk, cheese, yogurt other milk product	1.yes 2.No

8. Behavior Related Factors

S.N	Question	Response	Skip to
801	Do you a habit of Smoking?	1.Yes	If2 ,803
		2.No	
802	If your answer is yes for how long do you smoke?	1. < 6 months	
		2. > 6 months	
803	Do you drink alcohol?	1.Yes 2.No	
804	If your answer is yes for how long do you smoke?	1. < 6 months	
		2. > 6 months	

9. Anthropometric Measurement

S.N	Measurements.	Response.	Code
901	Weight	……..In Kg	
902	Height	………In cm	

Annex 3: Amharic form of Participant's Consent and Information Sheet.

Annex 3.1 .Data collection and consent form

የአማረኛ ፍቃዴ መጠየቂያ ቅጽ

የምርምሩ/የጥናቱ ርዕስ:

በላ/አራጭሆ ወረዳ ውስጥ በሚገኙ የሁለተኛ ደረጃ ሴት ተማሪዎች ላይ የአመጋገብ ስርአበተመለከተ እና በአመጋገብ ስርዓቱ ላይ ተጸዕኖ የሚያደርሱ ጉዳዮችና ተያያኝቦነታቸውን የሚገልጽ ነው ፡፡

የዋና ተመራማሪው ስም፡ አለምጸሀይ ታየ

የድርጅቱ ስም፡ ባህርዳር ዩኒቨርሲ የስርአተ-ምግብ፣ ኬሚካሌና ምግብ ምርምር ክፍል ወጪዉን የሚሸፍነው አካሌ፡በራሱ በተመራማሪው

መግቢያ:

ይህ የመረጃና የስምምነት ውል ቅፅ የተዘጋጀው **በላይ** አርማጭሆ ወረዲ ውስጥበሚገኙ የሁለተኛ ደረጃ ሴት ተማሪዎች ሊይ የአመጋገብ ስርአትን በተመለከተ እናበአመጋገብ ስርዓቱ ላይ ተጸዕኖ የሚያ□ርሱ ጉዳዮችን በተመለከተና ተያያኝቦነታቸውን የሚገልጽ ነው፡፡

ዋና ዓላማዉም ስለ ምርምሩ ዓላማ፣ ስለ መረጃ አሰባሰቡ እንዱሁም ጥናቱን ለማካሄዴ ፈቃድ ለማግኘት ከሲይ የተገለፁትን አካላት ግልፅ እንዲሆንላቸዉ ለማዬረግ ነዉ፡፡

የጥናት ፕሮጀክቱ የሚካሄዴበት ምክንያት

የጥናቱ ዓላማ :

በላይ አረማጭሆ በሚገኙ የሁለተኛ ደረጃ ሴት ተማሪዎች ላይ የአመጋገብ ስርአትን በተመለከተ እና በአመጋገብ ስርዓቱ ላይ ተጸዕኖ የሚያ□ርሱ ጉዳዮችን በተመለከተና ለሎች ተያያኝ ነገሮች ለማጥናት ታቅዶ የተዘጋጀ ነዉ ፡፡ የጥናቱ ግኝት ችግሩን ለመፍታት በተለይም ደግሞ ጥናቱ በሚካሄዴበት ቦታ ትክክለኛ የሆነ የመፍትሄ አቅጣጫ ለመቅረፅ እንደመነሻ መሠረት ያገለግላሉ፡፡

አተገባበር:

የጥናቱን አላማ ለማሳከት በላ/አረማጭሆ ወረዳ ውስጥ የሚገኙ የሁለተኛ ደረጃ ሴት ተማሪዎችን ያካትታል ፡፡ ሊገጥም የሚችል ችግር/አለመመቸት በዚህ ጥናት ሊይ ምንም የሚደርስባቸዉ ጉዳት የለም፡፡ ነገር ግን መረጃቸዉ ለጥናት በጣም አስፈሊጊ ነዉ፡፡

ጥቅሞች:

በዚህ ጥናት ተሳታፊ የሚሆኑትሴት ተማሪዎች በቀጥታ ሊያገኙት የሚችሉት ጥቅም ባይኖርም መረጃቸዉ ግን በአመጋገብ ስርዓቱ ላይ ተፅዕኖ ፋጣሪ ጉዳዮች ለማጥናት ይጠቅማል፡፡

የተሳትፎ ክፍያዎች:

በጥናቱ በመካፈልዎ የሚሰጥ ክፍያ የለም፡፡

ሚስጥር ስለመጠበቅ

በዚህ ጥናት የሚሰበሰብ መረጃ በሚስጥር ይጠበቃል፡፡ የሚሰበሰበዉ መጠይቅ የእርስዎ ለመሆኑመለያ አይኖረዉም፡፡ መረጃዉ በዋና ተመራማሪዉ ዴብቅ ፋይሌ ተደርጎ በቁልፍ የሚቀመጥ በመሆኑ ሊላ ሰዉ ሊያገኘዉ አይችልም፡፡

ሉገናኙዋቸዉ የሚችለ ሰዎች

የትኛዉም ዓይነት ጥያቄ ቢኖርዎት ከዚህ ቀጥል የተጠቀሱትን ግለሰቦች በማግኘት መጠየቅ ይችላል፡፡

አለምጸሐይ ታየ

የሞባይል ስልክ ቁጥር:+0918808248

ኢሜል alemtaye01@gmail.com

3.2 Consent form

በባህርዳር ዩኒቨርሲቲ በስነ-ምግብ፣በኬሚካሌና ምግብ ምርምር ኢንስቲትዩት በላ/አረማጭሆ ወረዳ ውስጥ በሚገኙ የሁለተኛ ደረጃ ሴት ተማሪዎች ላይ የአመጋገብ ስርአትን በተመለከተ እናበአመጋገብ ስርዓቱ ላይ ተጽዕኖ የሚያደርሱ ጉዳዮችን በተመለከትናሊሎች ተያያዥ ነገሮችን አስመሌክቶ የተዘጋጀ መጠይቅ ነዉ.

መግቢያ

ሠላም እንደምን አለቹህ? ስሜ_____እባላለሁ፡፡ከዚህ የመጣሁት ይህንን ጥናት የሚያካሂደዉ በባህርዲርዩኒቨርስቲ ስነምግብ፣ኬሚካሌና ምግብ ምርምር ተማሪ የሆኑት የአለምጸሀይ ታያ የጥናት ቡድን አባል ሆኜ ነዉ፡፡ከዚህ በመቀጠል በላይ አርማጭሆ ወረዳ ውሥጥ በሚገኙ የሁለተኛ ደረጃ ሴት ተማሪዎች ላይ የአመጋገብ ስርአትን በተመለከተ እና በአመጋገብ ስርዓቱ ላይ ተጽዕኖ የሚያደርሱ ጉዳዮችን በተመለከትና ላሎች ተያያዥ ነገሮች ሊይ የተወሰኑ ጥያቄወችን ማካሄድ ነዉ፡፡ የዚህ ምርምር ውጤት ያለዉን የአመጋገብ ሁኔታ(ችግር) ከማሳየቱ በተጨማሪ ችግሩን ለመፍታት ታላቅ ዕገዛ ይኖረዋሌ :: ለምጠይቀዉት ጥያቄዎች የዕርስዎ ትክክለኛ መልስ በጣም አስፈሊጊ ነዉ :: በጥያቄዎች ዙሪያ ጥርጣሬ ካደረብዎት ጠያቂዉን እንላገና መጠየቅ ይቻላል፡፡ ከእርስዎ የምናገኘዉን ማንኛዉንም መልስ በሚስጥር እንጠብቃለን ከዚህ ጥናት ጋር በተያያዝ በማንኛዉም ቦታ እና ጊዜ ስምዎ እንዲይመዘገብና እንደማይጠቀስ ልንገልዕልዎ እንወዳለን ::

ለጥናቱ የምንሳትፍዎ የእርስዎ ሙለ ፈቃዶኝነት ስነገኝ ብቻ ነዉ፡፡ በመጠይቁ ያለመሳተፍ ወይም በመጠየቁ ሂደት ሊመለሱት የማይፈልጉትን ጥያቄ ያለመመለስ መብትዎ የተጠበቀ ነዉ ለትብብርዎ በጣም እናመሰግናል

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Annex 3.2: Amharic form of the questionnaire.

ቃለመጠይቅ በአማርኛ

መለያ ቁጥር--------------ት/ቤት------------ቀን ----

1. ማህበራዊና ስነ-ህዝባዊ መረጃ

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶች
101	ዕድሜ	------------------ዓመት
102	መኖሪያ ቦታ	1.ከተማ 2. ገጠር
103	የተማሪውየክፍል ደረጃ	1.9 2. 10 3. 11 4. 12
104	ት/ቤት	1.መንግስታዊ ተቋም 2.መንግስታዊ ያልሆነ ተቋም
105	ሃይማኖት	1.ኦርቶዶክስ 2.ሙስሊም 3. ፕሮቴስታንት
106	የአባት የት/ት ደረጃ	1.ማንበብና መጻፍ የሚችል 2. ማንበብና መጻፍ የማይችል 3.አንደኛ ደረጃ ያጠናቀቀ 4. ሁለተኛ ደረጃ ያጠናቀቀ 5. ኮሌጃ ከዚያ በላይ
107	የአባት የስራ ሁኔታ	1.የመንግስት ሰራተኛ 2. አርሶ አደር 3. የቀን ሰራተኛ
108	የእናት የት/ት ደረጃ	1.ማንበብና መጻፍ የምትችል 2. ማንበብና መጻፍ የምትችል 3. አንደኛ ደረጃ ያጠናቀቀች 4. ሁለተኛ ደረጃ ያጠናቀቀች 5. ኮሌጅና ከዚያ በላይ
109	የእናት የስራ ሁኔታ	1. የቤት እመቤት 2.የመንግስት ሰራተኛ 3.ነጋዴ
110	የቤተሰብ ጋብቻ ሁኔታ	1. ጋብቻ የሌላቸው 2. በትዳር ያሉ 3. የተፋቱ
111	የቤተሰብ አባላት ብዛት	1. ከሶስት በታች 2. ከ3-5 3. ከ5 በላይ
112	የቤተሰብ የገቢ ምንጭ	1.የወርደመወዝ 2.ንግድ 3.የግብርና

2. የአመጋገብ ስርዓትን የተመለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄዎች	የጥያቄው ምላሽ
201	በቀን ስንት ጊዜ ትመገቢያለሽ	1. አንድ ጊዜ 2.ሁለት ጊዜ 3. ሶስት ጊዜ 4. አራትና ከዚያ በላይ
202	ባለፈው 24 ሰአት ውስጥ ቁርስሽን በልተሽ ነበር?	1. አዎ 2. አልበላሁም
203	ባለፈው24 ሰአት ውስጥ ምሳሽን በልተሽ ነበር?	1. አዎ 2. አልበላሁም
204	ባለፈው 24 ሰአት ውስጥ መክሰስሽን በልተሽ ነበር?	1.አዎ 2. አልበላሁም
205	ባለፈው 24 ሰአት ውስጥ እራትሽን በልተሽ ነበር?	1. አዎ 2. አልበላሁም
206	አዘውትረሽ የምትመገቢው የምግብ የአመጋገብ ስርዓት የትኛውን ነው?	1. ቁርስን 2. ምሳን 3. እራትን
207	ባለፈው ሳምንት ሳትመገቢ ያለፍሽው አለሽ ወይለምሳሌ ቁርስ ፤ምሳ ፤እራት	1. አዎ 2. የለም
208	ባለፈው ሳምንት ሳትመገቢ ያለፍሽው በምን ምክንያት ነው?	1.በቤት ውስጥ የአቅርቦት ችግር 2.የምግብ ፍልጎትት አለመኖር
209	ባለፈው ሳምንት ሳትመገቢ ያለፍሽው ለምን ያህል ጊዜ ነው?	1.ከ3 ጊዜ በታች 2. ከ3-5 ጊዜ 3. ከ5 ጊዜ በላይ
210	የቤተሰቡ አባል በሙሉ በአንድ ላይ አብሮ ይመገባል?	1. አዎ 2.አይመገብም
211	በምግብ አመጋገብ ስርአቱ በመጀመሪያ የሚመገበው ማነው?	1.አባት 2.እናት 3.እናት እና አባት 4. ልጆች
212	ከልጆች ውስጥ የትኛው ጾታ በመጀመሪያ ይመገባል?	1.ሴት 2.ወንድ 3.ሁለቱም በአንድ ሊይ
213	ምን አይነት ፤ምግብ ነው፤የምትመገቢው	1.ፍሬሽ ያልሆነ 2. ፍሬሽ የሆነ

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3. ጤናዎን በተመከተ የተዘጋጁ ጥያቄዎች

ተ.ቁ	ጥያቄዎች	የጥያቄው ምላሽ
301	ላለፉት ሁለት ሳምንታት ህመም ተሰምቶሽ ነበር?	1.አዎ 2. አላመመኝም
302	ለለፉት ሁለት ሳምንታት ምን አይነት ህመም ተሰምቶሻል?	1. የመተንፈሻ አካልት ህመም 2.ተቅማጥ እና ትውኪያ 3. የጆሮ ህመም
303	ህመሙ ለምን ያህል ቆየ?	ከሶስት ቀን ያላነሰ 2. ከ3-5 ቀን 3. ከ5 ቀን በላይ
304	ባለፈው ሳምንት ለምን ያህል ጊዜ በሳሙና ታጥበሻል?	የቀን ብዛት ይጥቀሱ- -

4.የቤት ውስጥ ሁኔታን የሚመለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄዎች	የጥያቄው ምላሽ
401	ለመጠጥ የምትጠቀሚው ውሃ ምን አይነት ነው?	1.የግል ቧንቧ 2. የህዝብ ቧንቧ ውሀ 3.ንዕህናውንየጠበቀ የጉድጓድ ውሀ 4.ንዕህናውንያልጠበቀ የምንጭ ውሀ 5.ንዕህናውንያልጠበቀ የጉድጓድ ውሀ
402	ለመጠጥ የምትጠቀሚው ውሀ ንዑህ እንዲሆንእድርጌሸው ታውቂያለሽ?	1. አዎ 2. አላውቅም 3. ንዑህ ስለማድረግ እውቀና የለኝም
403	ውሀው ንዑህ እንዲሆን የተጠቀምሽው የትኛውን ዘዴ ነው?	1. ውሀውን በማፍላት 2. ኬሚካል በመጨመር 3.ንዑህ በሆነ ጨርቅ በማጣራት 4.የፀሀይ ሀይልን በመጠቀም
404	ለምንድነው የምትጠቀሚው ውሀ ንዑህ እንዲሆን ያላደረግሽው?	1.በቂ የሆነ ጊዜ ስለማይኖረኝ 2. የገንዘብ እጥረት
405	ውሀውን ካለበት ወደ ቤት ለማምጣት ምን ያህ ጊዜ ይፈጅብሻል?	1.ከ15 ደቂቃ በታች 2. ከ15 ደቂቃ እስከ አንድ ሰአት 3. ከአንድ ሰአት በላይ
406	በቤታችሁ ግቢ ውስጥ የአትክልት ቦታ አለ?	1. አለ 2. የለም
407	በአትክልት ቦታው ምን አይነት አትክልት አለ?	1.ፍራፍሬ 2. ቅጠላ ቅጠል 3.ፍራፍሬና ቅጠላ ቅጠል

408	በአትክልት ቦታው ያሉትን ፍራፍሬና ቅጠላ ቅጠል ለምን አገልግሎት ታውያለሽ?	ለቤት ውስጥ ምግብነት 2. ለገቢያ ሽያጭ 3.ለቤት ውስጥ ምግብነትና ለገበያ ሽያጭ
409	በቤታቹ ግቢ ውስጥ ራሱን የቻለ ሽንት ቤት አለ?	1. አዎ
		2. የለም
410	ምን አይነት ሽንት ቤት ነው ያላችሁ?	1. ትክክለኛ የሽንት ቤት አሰራርን የተከተለ እና ንፁህ የሆነ 2. ጉድጓድ አይነት ሆኖ የእንጨት መረባርብ ያለው 3.ጉድጓድአይነትሁኖየእንጨ ትመረባርብ የሌለው
411	መፀዳጃ ቦታ የት ትጠቀሚያለሽ?	1. ውጭ ሜዳ ላይ 2.ለህዝብ አገልግሎት ከተሰራ ሽንት ቤት

5. ጤናዎን እና አመጋገብዎን በተመከተ ያለዎትን እውቀት የሚለኩ ጥያቄዎች

501	የወጣቶችንጤናእና አመጋገብንበሚመለከትክበብ አባል ነው	1.አዎ 2.አባል ሁነ	መልሱ 2 ከሆነ503 ሂጅ
502	በወጣቾች ክበብ አባል እያሉ በምን አይነት ህላፊነት ላይ ነበሩ?	1.ስለ ቆዳ የግል ንጽህና 2.ስለ አመጋገብስርአት	
503	የተለያዩ የብዙሀን መገናኛ ፕሮግራሞችንተከታትለሽ ተውቂለሽ?	1.አዎ 2.ተከታትዬ አላውቅም	መልስሽ 2 ከሆነ601 ሂጅ
504	የትኛውን የብዙሀን መገናኛ ፕሮግራም ዘዴ ትጠቀሚሰሽ?	1.ሬዲዮ 2.ቴላብዠን 3.ጋዜጣ	
505	በሳምንት ምን ያህል ጊዜ ቢያንስ ለአንድ ስአት መገናኛ ብዙሀን ትከታተያለሽ	1.ከ1-3ጊዜ 2.ከ3-5ጊዜ 3.ከ5 በላይ ጊዜ	

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6. የወር፣ አበባ ዎትን፣ በተመለከተ የተዘጋጁ ጥያቄዎች

601	የወር አበባ ኡደትን ማየት ጀምረሻል?	1. አዎ ጀመሬያለሁ 2.አልጀመርኩም	መልሰሽ2 ወደ ጥያቄ 701
602	ለመጀመሪያ ጊዜ የወር አበባ ኡደትን ማየት የጀምርሽው በስንት አመትሽ ነው?	1.ከ12አመት በታች ባለአመታት 2.ከ12-14 አመት ባለት አመታት 3.15 አመት በላይ	
603	የወር አበባሽ ስንት ቀን ይቆያል?	1.ከ3 ቀን ያነሱ ጊዜያት 2.ከ3-5ቀናት 3.ከ6-8ቀናት	

7. በ 24 ሰአታት ውስጥ የሚመገቡትን የምግብ አይነት የሚመለከቱከቱ ጥያቄዎች

ተ.ቁ	ጥያቄዎች	ምሳሌ	መልስ
701	ባለፈው 24ስአታት ውስጥ ስታርችነት ያለው ምግብ ተመግበሻል?	በቆል፣ ሩዝ፣ ስንዳ፣ ማሽላ እና ሌሎችን የጥራጥሬ አይነቶች	1.አዎ 2.አልተመገብኩም
702	ባለፈው 24 ስአታት ውስጥ አረንጓዴነት ያሊቸውን ቅጠላ ቅጠል ተመግበሻል?	ጠቆርያለ አረንጓዳነት ያለው ቅጠላ ቅጠል እንደ ጎመን እና ሌሎችንም አይነት	1.አዎ 2.አልተመገብኩም
703	ባለፈው 24 ስአታት ውስጥ በባይታሚ-ኤ-የበለጸጉ ምግቦች ተመግበሻል?	ዱባ፣ካሮት፣ስኳር ድንች፣ቃሪያ	1.አዎ 2.አልተመገብኩም
704	ባለፈው 24 ስአታት ውስጥ ሌላ አይነት ፍራፍሬ እና አትክልት ተመግበሻል?	ሌሎች የአትክሌት አይነቶች እንደ ቲማቲም፣ነጭሽንኩርት፣ ቀይሽንኩርት፣ደርላይየሚበቅ ሉ አትክልሑ እናፋረፋሪ	1.አዎ 2.አልተመገብኩም
705	ባለፈው 24 ስአታት ውስጥ አርጋን ስጋ ተመግበሻል?	ጉበት ፣ኩላሊት፣ልብ	1.አዎ 2.አልተመገብኩም
706	ባለፈው24 ስአታት ውስጥ ፍሬሽ ስጋ ተመግበሻል?	የበሬ ስጋ፣ የፍየልስጋ፣የደሮስጋ	1.አዎ 2.አልተመገብኩም
707	ባለፈው24 ስአታትውስጥ እንቁላል ተመግበሻል?	የደሮ እንቁላል	1.አዎ 2.አሌተገብኩም
708	ባለፈው 24ስአታት ውስጥ ባቂላ መሰል ጥራጥሬዎችን ተመግበሻል	ባቂላ፣አተር፣ምስር፣ለውዝ	1.አዎ 2.አልተመገብኩም
709	ባለፈው24 ስአታት ውስጥ የወተት ተዋዕጾችን ተመግበሻል?	ጥሬ ወተት፣አይብ፣እርኖ ሌሎች የወተት ውጤቶች	1.አዎ 2.አልተመገብኩም

8. ከባህሪ ጋር የተየያዙ ጥያቄዎች

ተ.ቁ.	ጥያቄዎች	አማራጭ መልሶች	ቀጣይጥያቄ
801	ሲጋራ የማጨስ ልምድ አለብዎት?	1. አላጨስም 2. አጨሳለሁ	ወድ 803 ሂጅ
802	መልስዎአጨሳ□ሁከሆነ□ምንያህሌጊ ዜአጨሲሰዋሌ?	1.ማጨስ ከጀመርኩ 6ወር አልሞላኝም 2.ማጨስ ከጀመርኩ ከ6 ወር በላይ ሆኖኛል	
803	አልኮል ይጠጣሉ ?	1. አልጠጣም 2. እጠጣለሁ	
804	መልስዎ እጠጣለሁ ከሆነ ለምን ያህል ጊዜ ጠጡ?	1.መጠጣት ከጀመረኩ 6ወር አልሞላኝም 2. መጠጣት ከጀመርኩ 6 ወር በላይ ሆኖኛል	

9. አንትሮፖ'ሜትሪክ መለኪያ

ተ.ቁ	መለኪያ	ምላሽ	ስያሜ
901	ክብደት	----------ኪ.ሎግራም	
902	ቁመት	--------- ሜትር	