NUTRITIONAL KNOWLEDGE ATTITUDE AND PRACTICES AND ASSOCIATED FACTORS AMONG PRIMARY SCHOOL ADOLESCENTS IN ANLEMO DISTRICT, HADIYA ZONE, SOUTHERN ETHIOPIA

BY: GEZEHAGN ASSEFA (BSc)

THESIS SUBMITTED TO THE DEPARTMENT OF HUMAN NUTRITION AND DIETETICS, COLLEGE OF HEALTH SCIENCES, JIMMA UNIVERSITY FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT FOR MASTER OF SCIENCE DEGREE IN HUMAN NUTRITION

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JIMMA UNIVERSITY
INSTITUTE OF HEALTH SCIENCE AND DEPARTMENT
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Abstract

Introduction: Dietary intake is a critical component contributing to human health and well-being, and dietary knowledge, attitudes, and practices (KAP). In addition, the family and community play an important role in the gaining of dietary knowledge and dietary-related practices. **Objective:** This study aimed to assess dietary knowledge attitudes and practices and associated factors among primary school adolescents. **Methods:** A Cross-sectional study was conducted from May 15- June 20/2021 in Anlemo District, Hadiya Zone. A total of 596 schools adolescent 10-19year were selected using Stratified random sampling techniques. Data was collected through face-to-face interviews using a structured questioner. Data were entered into Epi data version 4.6 and exported to SPSS for windows version 21 software for further analysis. Descriptive statistics, bivariable, and multivariable logistic regression analyses were done. Both crude odds ratio (COR) and adjusted odds ratio (AOR) with the corresponding 95% confidence interval (CI) were calculated to show the strength of association. The variables having a $p< 0.25$ in the bivariate logistic regression analysis were considered as candidate variables for multivariable logistic regression. P<0.05 was considered statistically significant. **Results:** A total of 596 students aged between 10 and 19 years old were included in the study with a 100% response rate. Analysis revealed that (63.8%, [95% CI=59.7, 67.5]) of the adolescent had good knowledge, (62.2%, [95% CI=59.2, 66.6] had good practices and (65.3%, [95%CI=61.4, 69.1]) had favorale attitude. Females were 1.5 times more likely to good knowledgeable (AOR: 1.5, [95%CI=1.02, 2.51]) when compared to males. Urban residences were 9.4times knowledgeable (AOR: 9.4, [95%CI=4.88, 16.28]) when compared to rural residences. Grade eight students were 1.9 times more likely to have good nutritional practice (AOR: 1.9, [95% CI=1.14, 3.28]) when compared to grade five. Females were 1.9 times more likely to have favorable dietary attitudes (AOR: 1.9, [95% CI= 1.28, 2.72]) when compared to males. Grade seven students were 2.6 times more likely to have favorable dietary attitude (AOR: 2.6, [95% CI=1.56, 4.64]) when compared to grade five. **Conclusion:** Adolescents had a good knowledge attitude and practice. Knowledge had no association with practices. However, attitude significantly influenced practices. **Recommendation**: the findings imply that need for creating knowledge on the effect of poor practices on overweight and obesity and associated to health risks. This should aim at improving knowledge, positive attitudes, and practices among adolescent.

Keywords: Nutrition Knowledge Attitude and practice, Adolescent

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Abbreviation

AOR: Adjusted Odds Ratio

BMI: Body Mass index

CI: Confidence Interval

COR: Crude Odds Ratio

CSA: Central Statistics Agency

CVD: Cardio Vascular Disease

EDHS: Ethiopian Demographic Health Survey

EFSA: European Food Safety Authority

FV: Fruit And Vegetable

HBSC: Health Behavior in School-aged Children Study

KAP: Knowledge Attitude and Practice

KNAPP: Kenya National Nutrition Action Plan

LMIC: Lower and Middle-income countries

NCD: Non-Communicable Disease

NHANES: National Health and Nutrition Examination Survey

NK: Nutritional Knowledge

SNP: School Nutrition Programm

PS: Primary School

SPSS: Statistical Package for Social Sciences

TNK: Total Nutritional Knowledge

UAE: United Arabi Emirate

UNICEF: United Nation International Emergency Fund

USA: United State Of America

USDA: United States Department of Agriculture

USDHHS: United States Department of Health and Human Services

WHO: World Health Organization

Chapter One: Introduction

1.1 Background

Adolescence is a period of transition between childhood and adulthood that demands extra nutrients and energy rich food. It is a very dynamic and active period of life and is a period of growth and life stress. Since the period demands high level of activity and growth, dietary requirements both quantitatively as well as qualitatively are of great importance. A failure to consume an adequate diet during adolescence can potentially retard growth and the over consumption of some nutrients can put the adolescents at increased risk for chronic disease(1).

Adolescents are described by the World Health Organization (WHO) as young people aged 10 to 19. Adolescence was a transition from childhood to adulthood (2,3). There are 1.2 billion adolescents in the world, with 90% of them living in low- and middle-income countries (LMICs), where they account for 19% of the population (4).

Adolescents were going through similar developmental milestones as they move to transition from infancy to adulthood. Rapid physical growth, physiological changes, sexual development, new and complex feelings, an increase in intellectual abilities, moral development, and changing relationships with peers and families were only a few examples, (5). Dietary intake was a critical component contributing to human health and well-being, and dietary consumption had a direct impact on children's health due to their physical and mental growth as well as cognitive development and long-term effects on general health status through the creation of life children's long term eating habits (6).

Adolescents eating behavior and food choices it's important and to briefly understand eating habit from an ecological perspective,(N., S,2010). Since the 1990s, research in the USA had shown that a commercial on children's television shows is often the prescribed diet, (7). In a2015 school-based survey of students aged 13 to17, the world health organization found that showed 21.8 percent of students were underweight with boys (28.0%) having a much higher prevalence than girls (16.3%), (8). Nutrition education in the Ghana School Feeding Programmed uses posters and songs promoting healthy eating habits and the meal planner tool enabled participants to learn about the nutritional value of locally available foods, (9).

Dietary consumption habits and obesity were linked with a variety of immediate and long-term complications, cardiovascular diseases, diabetes, high blood pressure, stroke, cancer, dental caries, asthma, and other psychological disorders such as depression were some of the consequences, and inadequate nutrition in adolescence can potentially retard growth and sexual maturation, although these are likely consequences of chronic malnutrition in early infancy and childhood (3,10). The importance of enhancing dietary awareness through nutrition education to affect healthier food decisions positively, (11). Knowledge of nutritious food options could be a factor in deciding to follow a healthy diet, (12,13). Even though educational interventions targeted towards school children had the potential to improve over the years, the ongoing global nutrition their knowledge and habits, (14).

1.2. Statement of the problem

Health problems arising from an excessive intake of calorie-dense foods which lead to obesity and/or nutritional deficiencies as a result of limited intake or poor choice of foods are common in adolescence. In the adolescent population, rates of obesity have more than quadrupled over the past 30 years,(15–17). Global nutrition transition has shifted dietary habits, particularly in urban settings. Market systems had been infiltrated by modernized convenient food culture leading to consumption of imported and processed foods some were highly refined, high in sugar, fats, and salts. High consumption of these foods coupled with less physical activity greatly contributes to rising lifestyle chronic diseases even among young adults, (18).

According to the World Health Organization, lifestyle and dietary factors account for 80% of the burden of chronic disease. Nutrition-related health issues, such as diabetes, obesity, cardiovascular diseases, and cancer, were often diagnosed and found to have a major effect on human health, (19). Iran, like many developing countries, is facing an increase in the prevalence of risk factors for non-communicable diseases due to lifestyle changes, especially nutritional habits while several studies indicate the relationship between nutrition and various diseases that might be due to poor knowledge and poor practices in nutritional habits. Some studies conducted in this region show that malnutrition and obesity have increased due to unhealthy dietary habits, (20).

In South Africa, the prevalence of overweight and obesity are more common in children and adolescent in primary schools. It was also becoming more common in children from rural areas, (21). Unhealthy dietary habits, such as eating nutrient-deficient food, missing meals, and failing to follow proper eating practices, have been linked to the development of diabetes, obesity, and dietary deficiencies have long-term health consequences in the population, (22). Obesity in adolescent increase the risk of heart disease, type 2 diabetes, stroke, multiple forms of cancer, and osteoarthritis, (23). It also had social and emotional consequences includes depression, stigmatization, and lower educational achievement, (24).

According to National Health and Nutrition Examination Survey (NHANES), 16.9% of children and adolescents in the United States are obese, and another 14.9% are overweight. Obesity becomes a global phenomenon. In 1980, affecting both adolescents and adults (25). In 1980, the world has witnessed an 'obesity epidemic' both among children's and adolescent. The number of obese children and adolescents (5–19years) has risen in number from 11 million in 1975 to 124 million in 2016, (26). There is evidence that the prevalence of overweight and obesity growing in lower middle income countries, (26).

School-age children in Kenya spend more time away from their parents, so peer pressures and media have an even greater impact on the development and stabilization of their eating habits (27,28). Some of the primary nutrition areas in (KNNAP) Kenya National Nutrition Action Plan 2012-2017, where to improve and control diet-related Non Communicable Diseases, as well as awareness, attitudes, and practices in optimal nutrition by creating, and behavior change system,(29). The global nutrition change had affected children eating behaviors, with a move toward increased consumption of processed foods, sugar-sweetened drinks, diets low in fruit and vegetables, a decrease in breakfast intake, and a decreased physical activity, all leading to a rise in obesity, non-communicable diseases and micronutrient deficiencies, (14).

In Ethiopia, in contrast to boys, girls face intra-household gender discrimination and were treated unfairly in terms of food allocation, opportunity during puberty, and work burdens, which leads to more nutritional problems among in adolescent girls. National nutrition baseline survey conducted in Ethiopia reported that girls in rural areas more likely to be stunted with the prevalence of 23% and 14% of adolescent girls had a low (BMI) body mass index for age (thin)

(30). Increasing awareness of healthy dietary habits was complex. But studies that access and analyze people's nutrition-related knowledge, attitudes, and practices are a useful method, (20).

Ethiopia government incorporated the concern of overweight/obesity into the national nutrition program, school feeding program and launched an initiative to promote physical activity in the population. Previously no study was conducted in the study area. To assess nutritional knowledge and dietary practices and adolescents in some selected primary schools in the Anlemo district. The findings served as baseline information for the development of health and nutrition intervention programs which helped to address (29).

1.3. Significances of study

Nutritional deficiencies and poor dietary practices established during adolescence can have long-term consequences, including delayed sexual maturation, loss of final adult height, osteoporosis, hyperlipidemia, and obesity. Based on this background, this study aimed to determine the current state of nutrition knowledge's, attitudes, and practices, and associated factors among seven primary schools in the Anlemo District. As a result, this evaluation of school adolescents was used to avoid nutritional status in the future by improving life and lowering the burden of non-communicable disease.

Unfortunately, there were no studies on student nutrition knowledge attitude and practice in the Anlemo District, and there are insufficient details. As consequence, understanding the students' knowledge is important. Therefore, knowing the students' knowledge, practices helps find ways to enhance the nutrition of this age group which consequently led to a healthier society, as this group formed the main body of families and professionals. Furthermore, the finding of this study contributed to basic knowledge for currently ongoing nutrition intervention programs, policymakers, and school feeding programs, as well as school adolescent intervention to enhance nutritional knowledge behaviors and practices.

Chapter Two: Literature Review

2.1 Nutrition Knowledge

Nutrition knowledge is one of the most important factors in choosing a healthy and nutritious diet,(31), and concepts are linked to awareness of diet and wellness, diet and disease, foods containing major sources of nutrients, and dietary guidelines and recommendations were all part of nutrition and health according to study conducted in Burie and Korea, (23,32). The major long-term health problems associated with adolescent obesity are its persistence in adult life and its association with cardiovascular disease risk in later life. It is estimated that half of cardiovascular disease mortality is nutrition-related, as well as 33% to 50% of type-2 diabetes cases,(3). Stress that nutrition knowledge was a key element to promoting lifelong healthy eating and should start at early stages of life. Nutrition education was an accessible effective tool in the promotion of healthy nutrition in education programs with a focus on healthy eating, (33,34).

Early Dietary patterns were more likely to carry to be adulthood. Nutritional knowledge was considered to affect dietary habits and favorable attitudes. There was a scarcity of data on nutrition knowledge, attitude, and behaviors, (28). A cross-sectional study conducted in Kenya 65% had good nutrition knowledge, and also implies, proper nutrition awareness affects good nutrition status, and, dietary awareness affects their ability to lives a healthy balanced lifestyle. Consequently, women's dietary awareness was important for good health and nutrition (22). A cross-sectional study conducted in Iran, females student had higher levels of nutritional knowledge than male adolescent students, these showed that stronger nutritional knowledge's regarding to daily consumption of food meals and food groups in comparison with males,(10).

Processed foods were quickly displacing organic food today. Many studies had shown that not eat a healthy diet and not knowing enough about nutrition could lead to health problems, such as overweight, and obesity, (35). A study conducted in eleven developing countries shows that the prevalence of stunting among Kenyan adolescent school girls was 12.1%, Nigerian adolescents was 67.3% of boys; 57.8% of girls were stunted and 64.2% of rural Tanzanian adolescents were stunted, (30). A cross-sectional study conducted in Metropolitan Prudent One's adolescents found that they lack nutritional knowledge because 85% of girls and 68% of boys had gains information from younger siblings. The adherence to the Rebels trend was lower, which was

around 4.0-times higher in children of mothers with primary education, 2.4 times higher in students with inadequate nutritional awareness, and 1.9 times higher in students from a family with more than four members, (36). Awareness concerning the level of consumers' nutritional knowledge is useful for promoting dietary practices and teaching good eating practices lead to reduced disease and treatment costs(16)

According to a cross-sectional study conducted in Indonesia, 99% of students had sufficient knowledge of healthy eating,(37), a similar study conducted in Tegede District,(34%) good dietary knowledge (38), and a similar study conducted in Burie District had good nutritional knowledge 62.3%,(23), high-grade students were six times more likely to have good nutritional knowledge when it compared to lower grade students, and a similar study conducted on Kenya, and, QwaQwa, South Africa among primary school students in had 72%,71% respectively,(23,28), Generally, 71% of the students performed well. Good nutrition knowledge among school students in rural QwaQwa, South Africa had also been reported by,(39).

Females had higher TNK score as compared with males. This showed that the students were sufficient in knowledge and understanding of the facts about energy and nutritive values of foods. Similar study findings were revealed in Slovenia school adolescents. The study also identified a gap in learners' knowledge of the functions of food groups in the body and further found that learners have inadequate nutrition knowledge despite the high indication of school lessons (12,40). Sex was a significant determinant of the adherence to the identified patterns, and metropolitan girls were more likely to avoid nutrition mistakes. This was confirmed a strong association of the female gender with the most healthy pattern and the male gender with the most unhealthy pattern(36).

2.2 Dietary practices:

Dietary habits were food that people choices to eat on regular basis. They vary from one person to the next. Fruits, vegetables, cereals, water; low-fat dairy products are all part of a healthy diet. Dietary habits were the choices that a person or a community makes regularly about what foods to consume, (23). Poor dietary habits were a major factor in the development of chronic non-communicable diseases. The majority of chronic diseases in the adult were caused by dietary habits that were developed primarily during childhood,(41,42).

A cross-sectional study conducted by Burie District 56.2 %, (23), found that females were 1.5 times more likely than males to have good dietary practice and that there was a difference in the role of different food groups in diet. A cross-sectional study conducted in Nepalese adolescents on the Prevalence overweight was 17.7%, (43), and a similar study conducted in Jimma adolescent girls on the Prevalence low dietary practice 61.3%, (31).

Breakfast intake was related to lower-level body fat content and a stronger cardiovascular profile. Adolescents consume half of the recommended amount of fruit and vegetables and less than two-thirds of the recommended amount of milk and milk products but consume more meat and meat products, fats, and sweets than recommended, (44). Sugar-sweetened drinks, sweetened milk, low-fat milk, and fruit juice had the most energy when it came to beverage consumption (45).

Many studies had reported that adolescents frequently consume an energy-dense diet which was poor quality in terms of essential micronutrients, (7), and contribute to factors including low meal frequency; skipping breakfast high consumption of sweetened beverages; increased consumption of energy-dense foods; increased consumption of food away from home; and skipping meals, (7,46). As the frequency of eating with the family is decreased and the number of children eating alone, or preparing a meal by themselves, was increased due to socioeconomic changes,(47). Higher parental education had 1.7times more likely to be significantly associated with eating fast food and snacks more than once a week. The urban area had 1.46 times more likely associated with ate fast food and snack, and also higher parental education 1.5 more likely were significant with fast foods more than one hour a day, (48)

According to data from national surveys conducted in 1997, Sugar-sweetened drinks remained the most common snack, with a higher frequency of consumption and smaller portion sizes, (7). Anemia, overweight, and obesity are risk factors for a teenager who consumed poorly. However, there was a scarcity of comprehensive assessment of dietary quality and habits in this population limited. Indonesia studies, 45% of girls were anemic and 17% overweight or obese. As compared to Eating 3–4 times and >4 times were correlated with a higher risk of developing Non-Communicable Disease, (49). The European Food Safety Authority (EFSA) defines sugars as ‘‘total sugars,’’ including both indigenous sugars naturally present in foods (i.e., ‘‘naturally

occurring sugars'') such as fruit, vegetables, cereals, and lactose in milk products, and added sugars. The term ''added sugars'' refers to sucrose, fructose, glucose, starch hydrolysates (glucose syrup, high-fructose syrup, isoglucose), and other isolated sugar preparations used as such, or added during food preparation and manufacturing,(50)

Large proportions of children do not fulfill the World Health Organization recommendation of eating at least 400 grams of fruit and vegetables (FV) per day. To promote an increased FV intake among children it was important to identify factors that influence their consumption,(51). In social welfare hostels, there is a high prevalence of undernutrition dental caries, and clinical anemia among adolescent girls in social, (52).

Misuse of psychoactive substances, particularly alcohol had been a growing health and social concern in Nigeria for many years. Adolescents and young adults had been listed as major groups involved in crime in Nigeria over the last decade, according to studies, (53). Gaps in adolescent girl's awareness, attitude, and practice about malnutrition pose a threat to health. Prevalence of underweight, overweight, and obesity is 15%, 8.4%, and 4.7% respectively, in a cross-sectional analysis conducted in Bahr Dar city, (54). The prevalence of thinness was found to be 10.1%, in a cross-sectional analysis conducted in Southern Ethiopia Children from urban areas were 65% less likely to be overweight, and acceptable dietary diversity was related to wealthy family status and where they lived, (55).

Malnutrition affects teenage girls and was linked to poor dietary practices and the socioeconomic status of parents. Adolescent healthy eating habits should change, with particular attention given to disadvantaged families and undernourished adolescents. Maternal anemia had become a more common decline from 27% in 2005 to 17.1% in 2016, (56). According to a cross-sectional study was conducted in Demba District 32.3% of the teenage girls had sufficient dietary diversity, (57). Habits involving regular eating patterns and vegetable intake were reported and represent practices that ought to be encouraged study show that the majority of students regularly ate three times per day, and almost 80% of students eat vegetables and fruit twice per day. These eating habits ought to be encouraged,(11).

According to a cross-sectional study conducted in Adama city of 21.3% of adolescent girls were underweight, 3.3% were overweight, 1.0% were obese and 15.6% were stunted,(58), a study just

girls have poor eating habits, according to findings. Micronutrient supplementation and health education for babies, small children, pregnant, and lactating mothers had been tried by the Ethiopian government, (57). As a consequence was important to keep track of adolescent food intake on regular basis. However, Scarcity of literature in the current study area. To that end, this study aimed to evaluate dietary awareness, attitude, and practices among primary school teenagers in the Anlemo district, Ethiopia

2.3. Sources of nutrition information

Students could be introduced to nutrition knowledge and technology in a variety of environments, including school climate, classroom curriculum, families, and communities. This data was important for advocating policies and services that encourage good health and nutrition (59,60). Mass communication was one of the most important ways of health communication. The emergence of new media has changed the way people acquire health information and then their health behaviors. However, few studies have been conducted about complicated relations between media use and health behaviors under new media conditions and further systematic explanation is needed,(61).

In Ohio, Shoaf and McClellan (1996) proposed that school physical education teacher was the primary source of nutrition knowledge. Participants who consulted healthcare professionals for nutrition information were (61%), more likely to had a high nutrition knowledge than participants who did not consult, according to a cross-sectional study conducted in Accra Metropolis of Ghana (92.7%) (62). According to a study conducted in Australia, mothers had a significant influence on their children's eating habits, whereas role as models or providers of foods,(62). Soft drink consumption by parents was found to be positively associated with younger children. Children who watched television for more than 2 hours a day were 2.3 times more likely to consume more than one, according to a Melbourne study of children and adolescents serve/day of high-energy drinks than children who watched less than or equal to 2 hours of Television per day,(62).

According to a cross-sectional study conducted in Kenya, 82 % of people consume food in front of the Television and 70% drunk sweetened drinks and 73% ate fast food. Unfavorable dietary attitudes were linked to moderate malnutrition awareness and poor dietary practices. This study

proposes activities to increase public understanding of the effect of poor dietary habits on obesity and related health risks (28).

2.4 Attitudes

Awareness was a requisite for behavior change, as knowledge increases, attitudes begin to change behavior through time, attitudes, the most liked food group was the drinks and snacks (72.9%), while the least liked food group was the fruits and vegetables (8.11%). The most frequently consumed food group was drinks and snacks (72.6%), whole fruits and vegetables were the least consumed. But, in a study conducted on primary school children in Tshwane Metropole, South Africa 78.91% of the learners displayed very good nutrition-related practice and attitudes (21).

The eating habits and behavior were games and entertainment. According to a study conducted in India variety of behavior acquired in the early years of life continues into change theories (14). Healthy eating among the girls was mainly the way food tasted, lack of appetite, and the feeling that they did not have to be concerned about what they ate since they were still young. A study conducted India Dehl among low-income, school-going adolescent girls, with similar findings were observed, (63).

Parental consumer attitudes were associated with parental educational level as well as with their children's taste preferences and food consumption patterns. According to a study conducted in turkey ascertained that the eating habits of students living far away from their parents vary; fruit and vegetable consumption decreases while fatty food consumption increases. It was a quite noteworthy point that the nutrition knowledge of students with parents who have higher education levels is lower than those of with primary school,(64). Should these associations prove to be present, this could be a pathway from low educational level to an unhealthy diet and thus offer a starting point for interventions. Parental consumer attitudes were1.2 times more likely associated with children's fat, sweet and sweaty taste preferences,(65). Consuming fast food was significantly higher among general school students, those of urban residence, those of working and highly educated mothers,(66).

2.5. Conceptual Framework

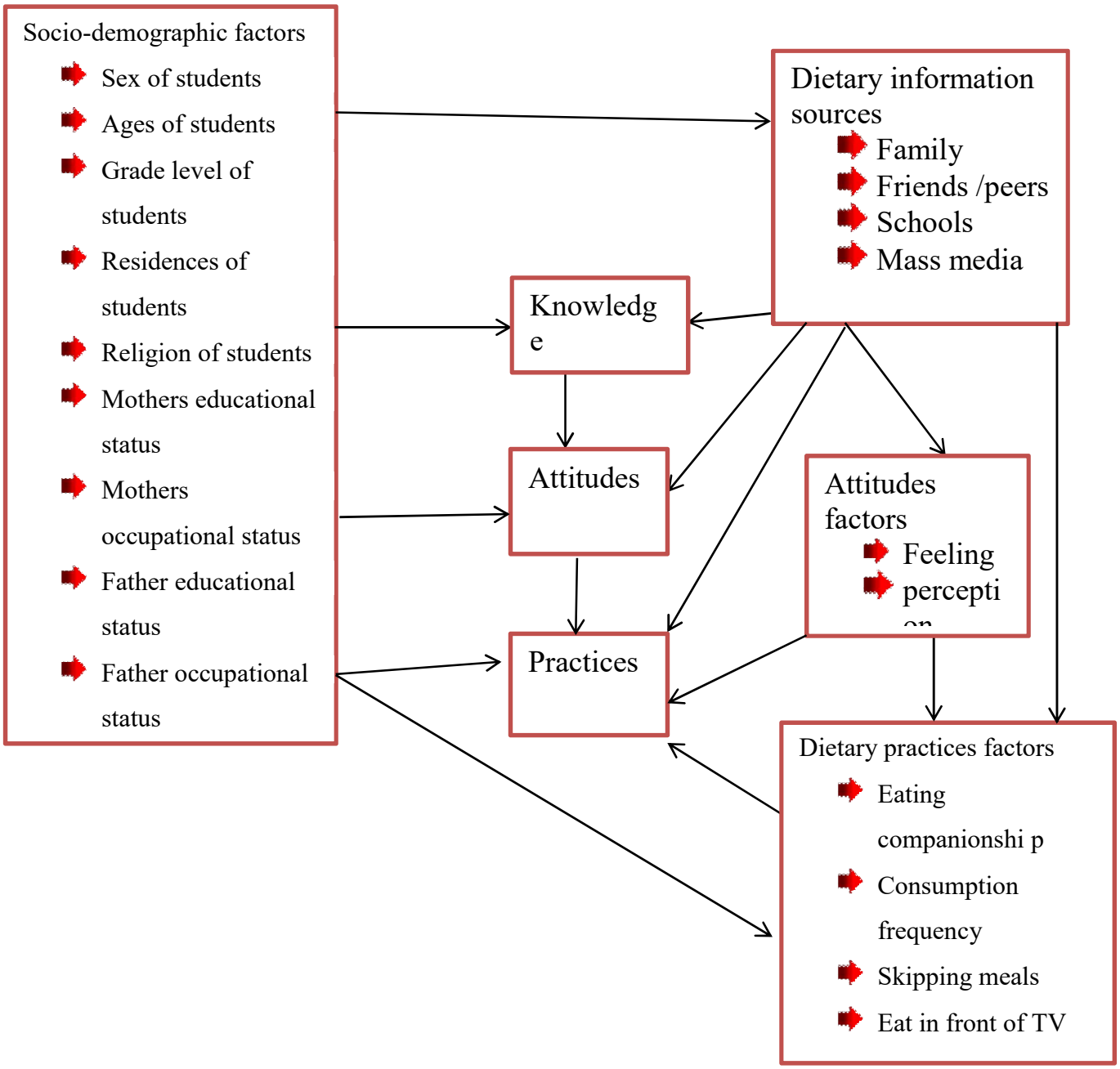

Figure 1. conceptual framework

(- Source: synthesized from different literature)

Chapter three: Objectives

3.1. General Objectives

To assess nutrition knowledge attitudes and practices and associated factors among primary school(grade5-8) adolescents in Anlemo District, Hadiya Zone Southern Ethiopia 2021.

3.2. Specific Objective

- To determine nutritional knowledge among primary school adolescents in Anlemo district, Hadiya Zone Southern Ethiopia.
- To determine nutritional practices among primary school adolescents in Anlemo district, Hadiya Zone Southern Ethiopia.
- To determine attitudes related to good nutrition among primary school adolescents in Anlemo district, Hadiya Zone Southern Ethiopia.
- To identify factors associated with nutrition-related knowledge among primary school students in Anlemo district, Hadiya Zone Southern Ethiopia
- To identify factors associated with nutrition-related attitudes among primary school students in Anlemo district, Hadiya Zone Southern Ethiopia
- To identify factors associated with nutrition-related practices among primary school students in Anlemo district, Hadiya Zone Southern Ethiopia

Chapter Four: Method and Materials

4.1 Study area and period

The study area Anlemo District was one of the 17 districts of Hadiya Zone, Southern Ethiopia. The district was located 224 km far from Addis Ababa in the southwest and 232km from Hawassa. It has 29 kebeles which were bordered by the Sileta zone in the north, Shashogo district in the east, Lemo district in the south & west direction. It had a climatic condition of 9.8% highland and 90.1 % midland.

According to the 2007(CSA) Central Statistics Agency report, the Woreda had a total population of 95,179 of which 47,304 (49.8%) were males and 48,875 (50.2%) were females. In the district, there were about 24 primary schools out of which 4 were found to be urban and the rest were found in rural. The total number of students attending primary schools in the area was 14,988, out of which 7,715 were males and the rest 7,273 were female students (sources: Anlemo Woreda administration of education office).

Hadiya Zone was one of the major areas for kocho production, processing, marketing, and consumption. Kocho in the Hadiya zone was a major food in most communities and increasingly plays a major role in improving farmer's livelihoods by providing a source of income and valuable source of employment especially for smallholder farmers. Kocho was the main product of the enset crop consumed after making a pancake-like food. According to a study conducted in Hadiya, more than 20 million people concentrated in the highlands of southern Ethiopia depend upon kocho for human food and sell,(67). The study period was from May 15- June 20/2021.

Figure 2. Study area maps

(- Source: Anlemo Woreda administration office)

4.2 Study design

A school-based cross-sectional study design was conducted among adolescents aged 10–19 years from seven randomly selected day governmental primary schools at Anlemo Districts to assess nutrition knowledge attitude and practices and associated factors among primary school adolescents**.**

4.3. Sources and Study Population

4.3.1. Sources Population

The sources populations were all adolescents living in the districts.

4.3.2. Study Population

Adolescent students in the randomly selected primary school and who were selected to participate in the study

4.3.3. Inclusion Criteria

All adolescent students who lived in the study area.

4.3.4. Exclusion Criteria

Adolescents who were non-voluntary to participate in a study

4.4 Sample size determination and sampling Procedure

4.4.1. Sample size determination

The sample size was determined using single population proportion formula by using the following parameters. The sample size was calculated for four variables independently from various studies and finally, the variable with maximum sample size was used.

Table 1. Sample size determination by using different Prevalence of studies.

S/n	**Variables**	**Confidence level**	**Margin of error**	**Expected Prevalence in %**	**Sample size**	**Design Effect**	**Reference**
1	Knowledge	95%	5%	62.3	361	541	(23)
2	Attitudes	95%	5%	72.9	304	456	(21)
3	Practice	95%	5%	56.2	379	568	(23)

4	Sources of information	95%	5%	61.2	365	547	(62)

Where: - $\mathbf{n = \frac{(z_{\alpha/2})^2 p(1-P)}{d^2}}$ **n**=minimum possible sample size

DE= design effect (1.5)

$\mathbf{Z_{\alpha/2}}$ = standard score value for 95 % confidence level =$Z_{\alpha/2}$ = 1.96

P= by using Prevalence of dietary practice= 0.562(56.2%)(23)

D= margin of error (5%)

Finally sample size, by adding 5% non-response rate, then final sample size were= 596

4.4.2 Sampling Procedure

The school-based cross-sectional study was conducted among primary school adolescents attending their education. Existing schools were divided into two categories: urban and rural. In the district, there were about 24 primary schools out of which 4 were found to be urban and the 20 were found in rural. A computer-generating system was used to choose three primary schools from urban areas and four primary schools from rural areas. 596 adolescent students were chosen using a random sampling technique by computer generating procedure. The number of students from selected schools was determined using the proportionate sampling approach. Finally, from grades 5-8, adolescents aged 10 to 19 years old were selected from both urban and rural primary schools (Figure 3).

The respective number of adolescent students was selected randomly from grades 5, 6, 7, and 8. Each class's data was gathered via a questionnaire presented to the students. The proportionate sample method was used to ascertain the number of students from each school.

4.4.3 Schematic frame of the sampling procedure

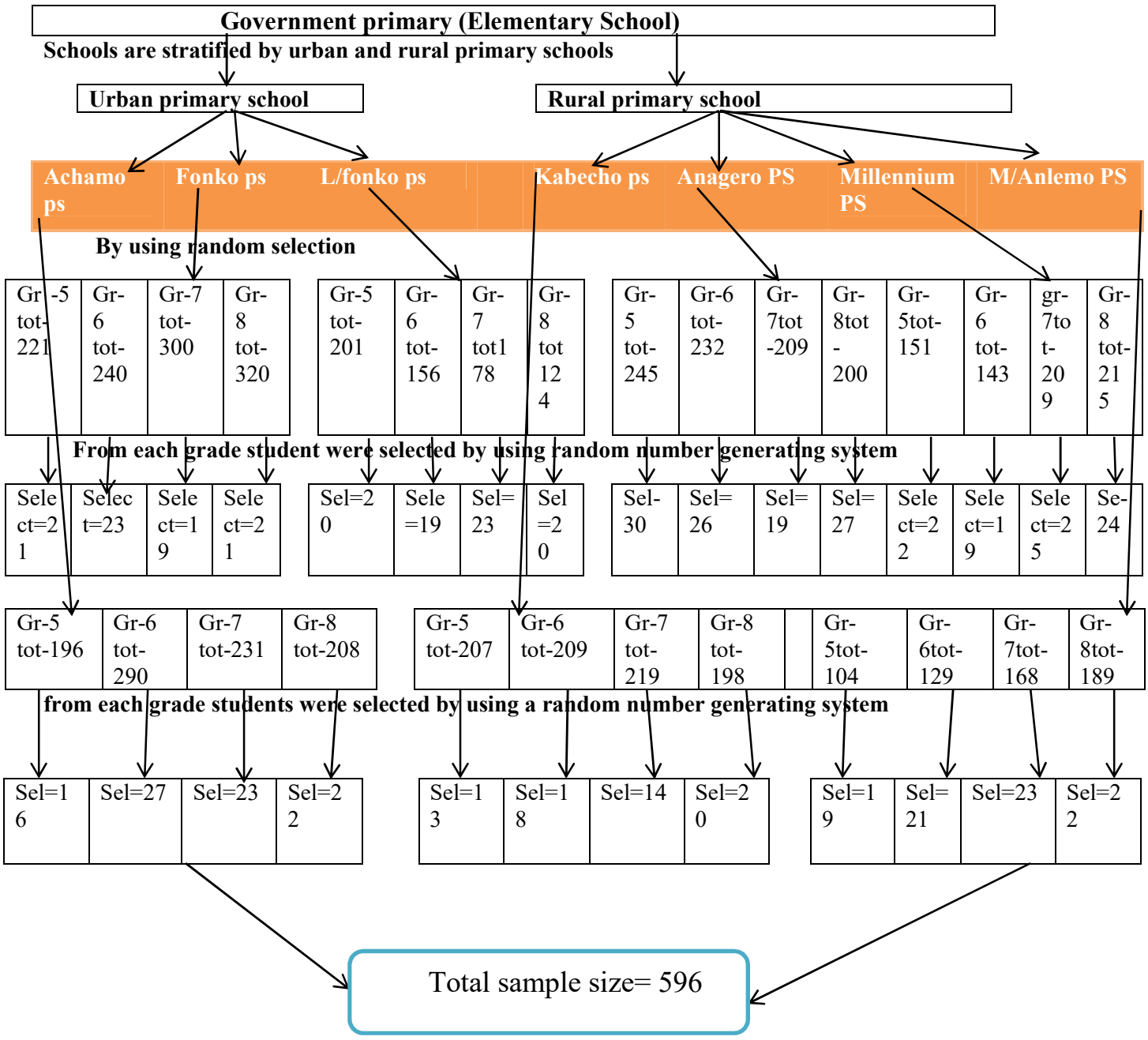

Figure 3 .sampling procedure

4.4.4. Data Collectors and Data Collection Procedures

A quantitative cross-sectional study design was used. The data collection tool was a structured questionnaire. The questionnaire was initially developed in English, and then translated into Amharic and back to English by professionals to ensure consistency. The first segment consisted of ten (×10) questions, each of which was aimed to assess the background characteristics of respondents. Sex, age, and grade level, and other background information were all factors to consider.

The second component, which consists of 16 (sixteen) closed-ended question items, was assessed to nutritional knowledge questions. The overall nutritional knowledge score was determined by adding the responses; each correct answer received '1' point, while the incorrect response received '0' points. For knowledge, the maximum and minimum scores were 16, and 0, respectively. That is, values above the mean were recorded as '1', which indicates good nutritional knowledge, and values below the mean were coded as '0,' which indicates poor nutritional knowledge. Dietary awareness was determined from the food group on what they know adapted from a similar study conducted in Jimma, Kenya, Malaysia, and Western Australians,(68)(69)(28)(31).

Dietary practice items consisted of six (6) questions that assessed respondents' dietary practices. The overall dietary practice score was computed by adding the responses; each correct answer received a "1," while the incorrect answer received a "0." The practice had a maximum and minimum score of 6, and 0 respectively. Similarly, higher scores indicated good dietary practices; that is, values above the mean were coded as "1," indicating good dietary practices, and values below the mean were recorded as "0," indicating poor dietary practices. Dietary practices were determined from the frequency of food consumption, habitual patterns on what they ate adapted from a similar study conducted in Jimma and Kuwait,(31)(70). The students' attitudes were measured using a five-point Likert scale ranging from 5=Strongly Agree, 4=Agree, 3=Undecided, 2=Disagree, and 1=Strongly Disagree. The student completed all of the questions in less than 20 minutes. Then, utilizing compute variables, responses were recorded to various variables, dichotomizing strongly agree and agree as "positive attitude," and strongly disagree and disagree as "negative attitude." Unfortunately, respondents were unable to select undecided/neutral responses; conversely, statements that did not favor teenagers were unable to

do so. The overall dietary attitude score was determined by summing the responses; each correct answer received a "1," while the incorrect answer received a "0." Attitude had a maximum and minimum score of 19 and a score of 0 correspondingly. 10.4 was the average mean result. Similarly, higher scores indicated positive dietary attitude, with values above the mean categorized as "1" and values below the mean coded as "0," indicating negative dietary attitude. Dietary attitudes were determined from perception and feeling of food consumption, on what they ate adapted from a similar study conducted in India (42). Then we may check the data that was normally distributed and got mean values. The final question was to determine where they obtained about nutritional information sources.

4.5 Variables

4.5.1 Dependent variables

Nutritional knowledge attitudes and practices

4.5.2 Independent variables

4.5.2.1 Socio-demographic variables

- ✓ Student's age
- ✓ Residence
- ✓ Religion
- ✓ Grade level of students
- ✓ The educational level of mothers
- ✓ Occupational status of mothers
- ✓ The educational level of the father and Occupation of the father is considered as independent variables

4.5.2.2 Dietary practice factors

Eating companionship

Consumption frequency

Meal skipping

Eat-in front of TV

4.5.2.3 Dietary Information source

Family

Friends

School

Mass media

4.6 Operational Definitions

Adolescent: - The chronological time between10 and 19 years of age.

Early adolescent 10-13 years of age

Middle Adolescent 14-16 years

Late adolescent 17-19 years old (WHO)

Attitude: Strongly disagree "1", disagree "2", don't know"3", agree "4", and strongly agree "5" were used to score attitude statement on a five-point Likert scale (1 to 5). The mean score for each attitude statement was used to be categorized into two groups. That instance, strongly agreeing and agreeing were seen as **positive attitudes** and coded as "1," whereas strongly disagreeing and disagreeing were regarded as **negative attitudes** and coded as "0." Scores less than the mean were regarded as **unfavorable attitudes**, while scores higher than the mean were considered **favorable attitudes** (47,71)(72)

Good knowledge: By adding the responses and scoring one for each correct answer and zero for each incorrect answer, a total dietary knowledge score was calculated. A correct response received a one-point score, while incorrect responses received a zero-point score. Greater than the mean score was considered **good** knowledge by an aggregate score and less than the mean score was considered **poor** knowledge by an aggregate score (31,73)

Good practice: The practice score was divided into two categories. Scores above the mean were deemed **good** practice, while, and scores below the mean were deemed **poor** practice. (71,74)

Meal frequency: just means how many times a day you eat, and it's measured by one time, two times, three times four times,(31)

Eating companionship: just means eating together, it's creating an experience and his/her family and friends. (75)

4.7. Data Quality Assurance

To assure data quality, the questionnaire was written in English and then translated into Amharic. 7(seven) trainers of data collectors and one supervisor would receive intensive training for one day on the study's goal, the contents of the questionnaire, and how to safeguard the study subjects' confidentiality and privacy. The principal investigator checked the collected data for accuracy any discrepancy and/or incompleteness. Logical checking techniques were used to identify any errors and missing values during data cleaning

4.8 Ethical Consideration

Ethical approval was received by Jimma University's Institutional Review Board before data collection. The Anlemo Woreda Education Office also granted permission. Before administering the surveys, permission was requested from all of the selected schools' principals/guardians. After an explanation of why they were participating in the study, each study subject gave their informed consent. The study forms included an informed consent statement. Class teachers and school directors gave verbal informed consent for the child to participate in the study. Furthermore, all information gathered from each study participant was kept confidential and private during the research procedure.

4.9.DataProcessingandAnalysis

The completed questionnaire was first assigned a code, after which the data was entered into Epidata 4.6 version and analyzed using the SPSS for Windows version 21 statistical program, with $P<0.05$ considered significant for all statistical tests. Data cleaning was carried out to ensure accuracy, consistency, and the absence of any missing values. Any inaccuracy detected was fixed. Frequencies, proportions, and summary data were used to displays descriptive results.

A binary logistic regression model was fitted to identify factors associated with nutritional knowledge, attitudes, and practices. The three outcome variables were coded as "1" for good knowledge and "0" for poor knowledge, as well as "1" for good practice and "0" for poor practice. Similarly, favorable and unfavorable attitudes were coded as "1" for favorable and "0" for unfavorable. Variables to consider as candidates for multivariable logistic regression were variables with a $p< 0.25$ in bivariate logistic regression analysis.

To screen independent predictors of dietary knowledge and practices, bivariate analysis was done, and variables with p< 0.25 in the bivariate analysis were exported to multivariable logistic regression analysis. The multi-co-linearity test was checked to see the correlation between independent variables by using standard error. The goodness of fit test was checked by Hosmer-Lemeshow's test was found to be significant, which indicates the model was fitted. The degrees of association between the independent variable and the outcome variable was quantified using the odds ratio and the corresponding 95 percent confidence intervals.

4.10 Plan for dissemination of the study

The study's findings will be sent to Jimma University's Institute of Health Sciences' Department of Human Nutrition and Dietetics, as well as Jimma University's Institutes of Health Sciences, Hadiya Zone's health department, Anlemo Woreda's health office, and Anlemo Woreda's Education Offices. It will also be presented at conferences, with a manuscript being submitted for peer-reviewed journals for publication.

5. RESULTS

5.1. Socio-Demographic Characteristics of the Respondents

A total of 596 school adolescents aged between 10 and 19 years old were included in the study with a 100% response rate. Boys account for 55.9% and the rest was girls. The mean (±SD) age of participants was 14.3 (± 2.6) years. Among this 146(24.5%) were early adolescents, and the majority 356(59.7%) were middle adolescents while 94(15.8%) of them were late adolescence. Urban residents account for 234(39.3%) and the rest from 362(60.7%) students are from rural areas. Baseline characteristic data were demonstrated in (Table 1)

Table 2 Distribution of socio-demographic characteristics of adolescent students in Anlemo district, Hadiya Zone, Southern Ethiopia, (n=596)

Variables	Characteristics	Frequency	percent
Sex	Male	333	55.9
	Female	263	44.1
Age group/years	10-13	146	24.5
	14-16	356	59.7
	17-19	94	15.8
Residence	Urban	255	42.8
	Rural	341	57.2
School place	Urban	255	42.8
	Rural	341	57.2
Grade	Grade 5	141	23.7
	Grade 6	153	25.7
	Grade 7	146	24.5
	Grade 8	156	26.2
Religion	Protestant	323	54.2
	Muslim	160	26.8
	Orthodox	70	12.6
	Catholic	30	5.0
	Others	8	1.3

Educational status of the mother	No formal education	201	33.7
	Can read and write	164	27.5
	Primary school	106	17.8
	Secondary school	23	3.8
	Above secondary	71	11.9
	Above diploma	31	5.2
Occupational status of mothers	Housewife	379	63.6
	Government employee	54	9.1
	private organization	25	4.2
	Merchant	132	22.1
	Other	6	1.0
Occupational status of the father	Farmer	294	49.5
	Government employee	147	24.7
	Private organization	46	7.7
	Merchant	84	14.1
	Other	20	4.0
Educational status of the father	No formal education	174	29.2
	Can read and write	147	24.7
	Primary school	106	17.8
	Secondary school	28	4.7
	Above secondary	141	23.7

5.2. Nutritional Knowledge among Adolescents in Anlemo District, Hadiya Zone Southern Ethiopia

The majority of the adolescents 380(63.8%) had good nutritional knowledge with a mean score of 10.2±2.17 SD. The remaining 216 (36.2%) had poor nutritional knowledge.

5.2.1 Knowledge of Dietary sources among school adolescents in Anlemo district, Hadiya Zone southern Ethiopia.

Adolescents who responded to consume the least, slightly less than half of the adolescence 242(40.6%) correctly indicated that fats, oils, and sweets group should be consumed the least. Similarly, more than half of the adolescence 354(59.4%) respond that Bread, grains, rice, and pasta group should be consumed frequently. The majority of the adolescents 401(67.3%) responds that fat-free foods always do not mean energy-free. When asked about nutrient sources slightly the majority of 501(86.2%) of the adolescent students knew the sources of carbohydrate, and a majority of 451(75.5%) of adolescents knew fat sources.

5.2.2 Knowledge of Diet Related Disease Relationships among school adolescent in Anlemo district, Hadiya Zone southern Ethiopia

Knowledge's of diet-disease relationship 214(35.9%) of adolescents aware of the fact that eating lots of sugary, sweets and sweet foods is not good for healths. Similarly 469(78.7%) of the respondents were aware that consumption of too much fat can make someone become fat. Two hundred eight two (47.3%) of the adolescents were aware of the problems of low intake of fruits and vegetables while 213(35.7%) of the adolescent respond that they were not aware of problems in low intake of fibrous food.

5.2.3. Distribution of Nutritional Knowledge in Grade Level of Students in Anlemo district, Hadiya Zone southern Ethiopia

Table 3. Distribution of nutritional knowledge in grade level of adolescents (n=596)

Nutritional knowledge item	**Correct answer %)**	**Grade5(%**	**Grade 6 (%)**	**Grade 7(%**	**Grade8(%**
Foods to be consumed the least	354(59.3	76(12.7)	61(10.2)	106(17.7)	111(18.6)
Foods should be consumed the most	262(44)	72(12)	69(11.5)	62(10.8)	59(9.8)
Fat-free foods always mean energy	401(67.2)	74(12.4)	105(17.6	92(15.4)	130(21.8

free			)		)
Know dietary sources of carbohydrate	452(75.8)	123(20.6)	121(20.3)	131(21.9)	139(23.3)
Knows the dietary sources of fats	451(75.6)	102(17.1)	141(23.6)	108(18.1)	100(16.7)
Knows the dietary sources of fibers	424(71)	96(16)	104(17)	108(18)	116(19)
Know the dietary sources of vitamin C	382(64)	90(15)	90(15)	107(17.9)	95(16)
Knows the dietary sources of proteins	340(57)	76(12.7)	90(15)	97(16.2)	77(12.9)
Diet disease relationship					
Eating a lot of sugar, sweets and sweet food can make fat?	320(54)	87(14.5)	81(13.50	69(11.5)	83(13.9)
Eat too much fat you can become fat	469(78.6)	108(18)	120(20)	116(19)	125(21)
Low intake of fruits and vegetables	282(47.3)	70(11.7)	71(11.9)	69(11.5)	72(12)
Low intake of fiber	383(64.2)	92(15.4)	105(17.6)	89(14.9)	97(16.2)
Much consumption of salt	382(64)	100(16.7)	106(17.7)	85(14.2)	91(15.2)
Amount of fat people eat	402(67.4)	97(16.2)	99(16.6)	97(16.2)	109(18.2)
Eating fruits and vegetables every day	385(64.5)	83(13.9)	86(14.4)	104(17.4)	112(18.7)

5.2.4. Nutritional knowledge and its associated factors among school adolescents in Anlemo district, Hadiya Zone Southern Ethiopia

Among Adolescents in bi-variable analysis variables like sex, residence, grade level, educational status of the adolescent father, mothers occupation, and educational status of mothers were associated with good nutritional knowledge ($p<0.25$). After fitting all these variables into the multivariable logistic regression, sex and grade level of the adolescents, residences, and occupation of a mother were predictors with nutrition knowledge ($P<0.05$).

The multivariate analyses showed that females were 1.5 times more likely to be knowledgeable (AOR: 1.5,[95%CI=1.00, 2.5]) when compared to adolescent males. Grade 8 adolescent students were 1.8 times more likely to be knowledgeable (AOR: 1.8, [95%CI =1.04, 3.3]) when to compared with grade 5 students. Similarly, urban residences student were 9.4 times more likely to have nutritional knowledge (AOR: 9.4, [95% CI =4.88, 16.28]) when compared to rural

students. Similarly, government employer mothers were.433 times less likely to have nutritional knowledge (AOR: .433, [95% CI =.24, .75]) when compared to housewives. The analysis was presented in the table below

Table 4. Nutritional knowledge and its associated factors among school adolescents in Anlemo district, Hadiya Zone Southern Ethiopia

Variables	knowledge				
	Poor (%	Good (%)	COR 95%CI	AOR 95%CI	P-value
Sex male	137	196	1	1	
female	79	184	1.6(1.15,2.29)	1.5(1.00,2.25	.049
Residences rural	193	169	1	1	
Urban	11	211	10.4(6.5,16.8)	9.4(4.8,16.2)	< .001
Grade 5^{th}	58	83	1	1	
6^{th}	62	91	1.02(.64,1.63)	1.19(.68,2.08)	.528
7^{th}	43	103	1.6(1.02, 2.73)	1.5(.84,2.69)	.163
8^{th}	53	103	1.3(.84 ,2.17)	1.8(1.04,3.30)	.034
Mother educational status					
No formal education	104	97	1	1	
Can read and write	53	111	2(1.46, 3.4)	1.17(.69,2.01)	.548
Primary school	40	66	1.7(1.09, 2.86)	.95(.52,1.74)	.876
Secondary school	23	10	5(1.67, 15.00)	1.7(.48, 6.13)	.396
Above secondary	15	87	6(3.61, 10.44)	2(.916, 4.52)	.081
Mother occupational status					
Housewife	149	230	1		
Gov't employer	8	46	3.7(1.71 ,8.11)	.43(.24, .75)	< .001
merchants	47	85	1.1(.77, 1.76)	.53(.18,1.54)	.247
Private employer	9	16	1.15(.46, 2.67)	.92(.150,5.67)	.930

Other	3	3	.64(.12, 3.25)	1.17(.41,3.33)	.760
Father educational status					
No formal education	51	77	1	1	
Can read and write	51	97	2(1.50 ,3.72)	1.9(1.11 ,3.40)	.119
Primary school	38	68	2(1.37 ,3.70)	1.46(.77 ,2.75)	.239
Secondary school	6	22	4(1.78,11.95)	1.47(.44 ,4.88)	.526
Above secondary	24	117	6(3.61,10.4)	1.7(.49 ,6.14)	.389
Father occupational status					
Farmer	144	151	1	1	
Gov't employer	27	120	4(2.63 ,6.82)	1.01(.305,3.34)	.987
merchants	26	58	2(1.27 ,3.56)	1.3(.67 ,2.58)	.423
Private employer	6	40	6(2.61 ,15.44)	2(.726, 5.86)	.174
Other	11	13	.807(.35 ,1.85)	.926(.371 ,2.31)	.869

5.3. Dietary Practices among adolescents in Anlemo District, Hadiya Zone Southern Ethiopia

The dietary practices of the school adolescents were assessed by the use of multiple choice questions. Among the respondents, 374(62.75%) had good nutritional practices and 222(37.24%) had poor nutritional practice's with a mean score of 2.78±1.6 SD.

5.3.1 Dietary practice response among adolescents in Anlemo District, Hadiya Zone Southern Ethiopia

One-third of adolescents 193(32.4 %) always ate food in front of the TV at home (Table 6). The majority 365(61.2%) of the respondents indicated that they often ate at the table with their family members. Another 70(11.7 %) indicated that they often ate alone (ate their food in the absence of their parent), and 161(27.0%) reported that they often ate with their peers or friends. The majority of students 428(71.8 %) respond that skipped meals would reduce weight. Concerning the average number of cooked meals usually consumed per day; the majority of these students ate three and more meals a day (54.5 %) while 271(45.5 %) ate less than three meals a day.

Regarding consumption of breakfast, the majority of the respondents (65.1%) indicated that they usually ate breakfast served at home before going to school. While 208(34.9%) of the student skipped breakfast before going to school; the common reason given by (37.0%) of the students who skipped breakfast was fasting day. Another (43.3%) indicated that they skipped breakfast because of the fear of getting to school late. Some (6.7%) also reported that breakfast was not usually prepared at home in the morning. The remaining 27(13.0%) skipped breakfast because of the fear of getting to weight gains.

Table 5. Nutritional practice factors frequency among school adolescents in Anlemo District, Hadiya Zone Southern Ethiopia

Variables	**Response**	**frequency**	**percent**
Ate in front of the TV	Yes	193	32.4
	Sometimes	294	49.3
	never	109	18.1
Meal consumption frequency	More than three times	325	54.5
	Less than three times	271	45.5
Eating companionship	Eating with a family member	365	61.2
	Eating with friends/peers	161	27.0
	Often eat alone	70	11.7
breakfast before going to school	Yes	388	65.1
	No	208	39.9
The reason attributed no to eat breakfast before school	Breakfast not prepared at home	14	6.7
	Fear of being late to school	90	43.3
	Fear of weight gain	27	13.0
	Other	77	37.0

skip the meal to lose weight	Yes	428	71.8
	No	168	28.2

5.3.3. Dietary practice and its associated factors among school adolescents in Anlemo district, Hadiya Zone Southern Ethiopia

In bi-variable analysis variables like age, sex, residence, grade level of students, occupational status of adolescent father and mother and father education were associated with good dietary practices ($p<0.25$). After fitting all these variables into the multivariable logistic regression, sex, residences, grade level of the adolescents, mother occupation, and knowledge and attitude factors were predictors with dietary practices ($P<0.05$).

Multivariate analysis revealed that females were 1.4 times more likely to have good dietary practice (AOR: 1.4, [95% CI= 1.01, 2.05]) when compared to adolescent males. Grade eight students were 1.9 times more likely (AOR: 1.9, [95% CI= 1.14, 3.28]) to have dietary practice when compared to grade five students. Analysis revealed that being urban residences were 1.6 times more likely to have dietary practice (AOR: 1.6, [95% CI=1.17, 2.32]) when compared to rural students. Private employee mothers were Odds of 3.5times more likely to have dietary practice (AOR: 3.5, [95% CI=1.29, 9.79]) when compared to housewives. Analysis revealed adolescents who prefer meat were 2.3 times more likely (AOR: 2.3, [95%CI=1.57, 3.23]) favorable attitudes when compared to fruit and vegetable eaters.

Table 6. Association of the variable with dietary practices of school adolescent in Anlemo District, Hadiya Zone Southern Ethiopia

Variables		Practices		Crude value	Adjusted value	P-value
		Poor (%	Good (%)	COR 95%CI	AOR 95%CI	
Age	10-13	52	77	1	1	
	14-16	111	181	1.10(.72, 1.68)	.89(.55 ,1.43)	.644
	17-19	59	116	1.3(.82, 2.12)	.87(.50, 1.49)	.623
	Sex male	134	199	1	1	
	female	88	175	1.3(.95, 1.87)	1.4(1.01, 2.05)	.041
Residences	rural	118	244	1	1	
	Urban	104	130	.605(.43,.84)	1.6(1.17, 2.32)	< .001
Grade	5^{th}	62	79	1	1	
	6^{th}	65	88	1.06(.66, 1.68)	1.09(.67, 1.79)	.708
	7^{th}	49	97	1.5(.96, 2.50)	1.7(1.02, 2.82)	.141
	8^{th}	46	110	1.8(1.163, 3.02)	1.9(1.14, 3.28)	.014

Mother occupational status					
Housewife	149	230	1		
Gov't employer	20	34	1.1(.61, 1.98)	1.29(.66, .2.54)	.448
merchants	45	87	1.2(.82, 1.89)	1.7(1.08, 2.74)	.052
Private employer	8	23	2(.80, 5.25)	3.5(1.29, 9.79)	.014
Other	3	3	1.2(.23, 7.16)	1.5(.24 , 9.37)	.656
Father educational status					
No formal education	58	116	1	1	
Can read and write	56	91	.81(.514, 1.28)	.89(.54, 1.46)	.661
Primary school	43	62	.72(.43, 1.18)	.91(.51, 1.61)	.760
Secondary school	10	18	.90(.39, 2.07)	1.3(.49, 3.43)	.587
Above secondary	55	27	.79(.49, 1.25)	1.19(.42, 3.37)	.742
Father occupational status					
Farmer	97	198	1	1	
Gov't employer	55	92	.81(.54, 1.23)	.74(.26, 2.07)	.572
merchants	37	47	.62(.38, 1.02)	.60(.33, 1.10)	.102
Private employer	24	22	.44(.24, .84)	.45(.21, .96)	.074
Other	9	15	.81(.34, 1.93)	.69(.28, 1.69)	.426
Practice with knowledge					
Fat free food	195	401	1.7(1.19,2.40)	1.6(1.16, 2.36)	.051
Source of fiber	424	172	.72(.49,1.05)	.89(.56,1.41)	.632
Sources of vitamin	382	214	.64(.45, 92)	.69(.44, 1.60)	.093
Consequence of low intake of fiber	383	213	.79(.55, 1.12)	.72(.42, 1.06)	.085
Eating fruit and vegetable everyday	211	385	1.2(.86,1.72)	1.2(81, 1.69)	.379
Eating a lot sugar and sweet	382	214	.81(.57, 1.14)	.70(.49, 1.02)	.065
Practice with attitudes					
Should eat many kind of food if possible	242	342	.73(.50, 1.07)	.69(.46, 1.05)	.085
I don't like cleaning school compound	185	411	1.2(.88,1.80)	1.1(.74, 1.63)	.620
All unfamiliar food are unhealthy food	74	522	1.7(1.04,2.05)	1.6(.92, 2.87)	.094
I don't worry about nutrition b/ces Iam young	289	307	.62(.44 ,87)	.56(.39,79)	.081
Prefer meat from vegetable	211	385	2(1.50,3.01)	2.3(1.57, 3.23)	< .001
Breakfast very important to me	273	323	1.3(.96,1.88)	1.2(.91, 1.84)	.140
Disposed rubbish any where	285	311	1.3(.97, 1.90)	1.4(.90, 1.96)	.078
I feel good when drink	247	349	1.5(1.04, 2.05)	1.3(.88, 1.81)	.198

boiled water

5.4 Sources of Nutrition Information

School adolescents were 352(59.1%) got nutrition-related information from health professionals followed by TV and radio 183(30.7%), family and friends 61 (10.2%) table (8)

Table 7. Sources nutritional information among school adolescents in Anlemo district, Hadiya Zone southern Ethiopia (n=596)

	Adolescent responses	
variable	Yes	No
Health professionals	352(59.1)	244(40.9)
Mass media	183(30.7)	413(69.3)
Family and friends	61(10.2)	535(89.7)

5.4.1 Ranking of sources of nutrition information

Sources of nutrition information were ranked according to sources that provided the most nutrition information to the students. The findings showed that families were ranked as the first source (66.9 %) they were followed closely by lessons taught by a health professional (22%) and by media (11.1%). This implies that the nutrition messages passed through the media should be well packaged to provide adequate and reliable nutrition information.

5.5 Adolescents' attitudes towards nutrition

The dietary practices of the school adolescents were assessed by the use of a 5-point Likert scale. Among the respondents, 389(65.27%) had favorable nutritional attitudes and 206.9(34.73%) had an unfavorable nutritional attitude with a mean score of 10.4± 2.74 SD.

5.5.1 Attitudes towards food choices, preparation, and food consumption

The statement "cooking is an enjoyable task" was meant to determine the learners' attitude towards food preparation. Whereas slightly more than one-fifth of the respondents 215 (36.1%) agreed with the statement 230 (38.6%) strongly disagreed and 149(25.0) disagree.

Similarly, 16.1% and 13.8% respectively strongly disagreed and disagreed with the statement that the taste of food was more important than its nutrient content. A similarly the statement that I do not have to worry about the kind of food I take because am still young as 25.3% strongly disagreed and 36.4% disagreed. In addition, 14.3% and 24.0 % strongly agreed and agreed respectively, that fruits are a healthy snack. The statement that all nutritious foods are expensive was to determine the opinion of respondents towards the cost of nutritious meal 20.6% strongly disagreed with the statement, 15.8% disagreed, and 12.8 % strongly agreed with the statement while most respondents 50.8% agreed with the statement. About 21.8% strongly agreed with the statement that breakfast is an important meal. (See on Annex-3)

5.5.2 Attitudes towards learning nutrition

When asked if learning about food and nutrition is enjoyable, more than half of the respondents were in agreement with this statement. About more than half of respondents, 68% and 16% strongly agreed and agreed respectively with this statement. (See on annex-3)

5.5.3 Hygiene and sanitation

The statement "We can dispose of rubbish anywhere as long as the teachers are not seeing us" was meant to determine the attitudes of respondents towards hygiene. One-fifth of the respondents (17.3%) and (19.0%) of the respondents strongly disagreed and disagreed with this statement respectively. The students had a positive attitude towards disposing of rubbish in the right place, which is important if a sanitary environment is to be maintained. Consistent with the findings more than half of the respondents (24.8%) strongly disagreed (14.1%) disagreed with the statement "I do not like cleaning the school compound because it makes me tired" When asked whether one can become sick if they do not wash their hands often, 20.0% strongly agreed with the statement whilst 21.6% agreed with this statement. Similarly, almost all of the respondents (91.6%) agreed with the statement "I feel good when I drink boiled water. (see in Annex-3)

5.5.4. Attitude toward nutrition and associated factors among school adolescents in Anlemo district, Hadiya Zone Southern Ethiopia

In bi-variable analysis variables like Sex, grade level of students, residence, educational status of the adolescent father, mother, mother occupation, occupational status of the father, and knowledge factors were associated with favorable nutritional attitude ($p<0.25$). After fitting all

these variables into the multivariable logistic regression sex, grade level of the adolescents, and knowledge factors were predictors of favorable nutritional attitudes (P<0.05).

Multivariate analysis revealed that females were 1.9 times more likely to have favorable nutritional attitudes (AOR: 1.9, [95% CI= 1.28, 2.72]) when compared to adolescent males. Analysis revealed that grade seven students were 2.6 times more likely to have a favorable attitude (AOR: 2.6, [95% CI= 1.51, 4.44]) when compared to grade five students. Analysis revealed that adolescents to consuming fat source food were 2.6 times more likely to have a favorable attitude (AOR: 2.6, [95%CI=1.67, 3.99]) when compared to fruits and vegetable consumption. Analysis revealed that adolescent had a consequence of much salt consumption were 1.5 times more likely have a favorable attitude (AOR: 1.5, [95%CI=1.06, 2.21]) when compared to low intake of fruit and vegetables. Our analysis revealed that adolescents had consequences of eating a lot of sugar and sweet 0.54 times less likely to have favorable attitudes (AOR: .54, [95%CI=.37, .80]) when compared to low intake of fruit and vegetables.

Table 8. shows the association of variables with dietary attitudes among adolescents in Anlemo District, Hadiya Zone Southern Ethiopia

Variables		**Attitudes**		**Crude value**	**Adjusted value**	**P-value**
		Unfavorable (%	Favorable (%)	COR 95%CI	AOR 95%CI	
Sex	male	71	192	1	1	
	Female	136	197	1.8(1.31, 2.64)	1.9(1.27, 2.71)	< .001
Residences	Urban	58	176	2(1.47, 3.05)	.819(.504,1.33)	.421
	Rural	62	102	1	1	
Grade	5th	63	78	1	1	
	6th	58	95	1.4(.90, 2.29)	1.4(.87, 2.45)	.140
	7th	47	109	2.7(1.62, 4.43)	2.6(1.56, 4.64)	< .001
	8th	36	110	2(1.26, 3.28)	2(1.35, 3.86)	.062
Mother educational status						
No formal education		78	123	1	1	

Can read and write	62	102	1.04(.682, .1.59)	.75(.44, 1.26)	.281
Primary school	33	73	1.4(.851, 2.31)	.82(.44, .1.50)	.523
Secondary school	7	16	1.44(.57, 3.68)	.78(.26, 2.35)	.667
Above secondary	27	75	1.7(1.04, 2.97)	.92(.44, 1.88)	.821
Mother occupational status					
Housewife	139	240	1	1	
Gov't employer	19	60	1.3(.740, 2.55)	.47(.201, 1.10)	.082
merchants	45	87	1.1(.739, 1.69)	.82(.512, 1.35)	.457
Private employer	Gov.	Gov.+	4(.1.24, 14.4)	3.2(.89, 11.83)	.074
Other	4	2	.29(.05, 1.60)	.40(.07, 2.30)	.307
Father educational status					
No formal education	80	94	1	1	
Can read and write	64	83	1.1(.710, 1.71)	.97(57, 1.65)	.914
Primary school	30	75	2(1.26, 3.57)	1.5(.85, 2.90)	.142
Secondary school	10	18	1.5(.(.66, 3.50)	.90(.33, 2.44)	.074
Above secondary	23	119	4(2.57, 7.53)	2.5(.80, 8.30)	.11
Father occupational status					
Farmer	137	158	1	1	
Gov't employer	26	121	4(2.49, 6.53)	2(.68, 6.10)	.203
merchants	24	60	2(1.28, 3.66)	1.9(1.05, 3.71)	.33
Private employer	9	37	3.5(1.66, 7.64)	2.5(1.04, 6.24)	.132
Other	11	13	10(.44, 2.36)	.95(.39 ,2.31)	.922
Attitude with knowledge's					
Low intake of fruit&vegetable	101	181	1	1	
Fat free food sources	195	401	1.3(.923, 1.89)	1.3(.93, 1.98)	.104
Sources of fat food	145	451	3(1.98, 4.27)	2.6(1.67, 3.99)	< .001
Source of fiber food	172	424	1.9(1.36, 2.4)	1.4(.91, 2.13)	.119
Sources of protein food	256	340	1.7(1.2, 2.42)	1.4(.92, 2.05)	.11
Eating a lot of sugar	320	276	.76(.54, 1.07)	.54(.37, .80)	< .001

sweet consequences					
Consequences of low intake of fiber food	213	383	.67(47, .96)	.62(.37, 80)	.085
Consequences of much salt consumption	214	382	1.7(1.19, 2.40)	1.5(1.06,2.21)	.022

6. Discussion

This study was conducted to assess the nutritional knowledge attitudes and dietary practices and associated factors of primary school adolescence because Sound nutrition was critical during adolescence; in fact, total nutrition needs are highest during this stage of life due to rapid growth. The majority of the students (63.8%, [95% CI=59.7, 67.5]) of the adolescent had good knowledge, (62.2%, [95% CI=59.2, 66.6] had good practices and (65.3%, [95%CI=61.4, 69.1]) had favorale attitude,and this is favorable in both sexes. This almost similar with other studies by Burie District, Kenya,Italy, QwaQwa, South Africa and Slovenia (62.3%,72%,62%and 71%)respectively (4,20,21,23,28,39,70,76,77). Females had significantly higher nutritional knowledge scores compared with males and this finding was similar to in the previous survey conducted in Poland, Italy, and Burie district (23,36,78). In a study conducted in Mexico and Netherlands, Iran, Kenya, Syrian, Kolkata India, and Bangladesh nutritional knowledge was a predisposing factor for eating behaviors (10,40,79–84). This might be confirming transfer of habits established in adolescence later through life. Also, it might be due to the study settings, socio-demographic characteristics of the respondents, availability, and accessibility of information due to mass media.

Urban residences had significantly higher nutritional knowledge when compared to rural residences. Our findings were similar to the previous survey in Croatian, Mansoura, Egypt Pakistan, and Bahri Dar respectively(38,48,66,85). The possible reason might be socio-demographic characteristics of respondent, study setting, implementation of urban health extension programs, accessibility and availiablity of nutritional information like social media.

Higher grades of students had higher levels of nutritional knowledge, which was mostly attributable to increased understanding of students when they were more trained and educated. This finding is agreement with the previous studies in Slovenia, Kenya, and Burnie, Finland, France, and Southern Brazil, (23,81,84,86–88). The possible reason might be educational status of respondent, ages of students, opportunity to gains information from different social media, and social interaction like peers and friends influeces.

A study conducted at the Iwo university of US and Califonia results suggest that nutrition knowledge may be controversial to practice((28,61,89–91). It might be a lack of instructional materials, a lack of research focusing on effective educational methods inadequate conceptualization and measurement of knowledge. Findings that dietary practices among adolescents were characterized by excess consumption of fast foods and sweetened beverages, an indication of unhealthy food choices and the main reason for consumption of these foods being sweet taste and easy accessibility, According to Lithuania and American population, were in agreement with other studies which found that young children from developing countries are increasingly making unhealthy food choices especially due to lack of knowledge and negative attitude (87,92–94).

In an Italian and Switzerland study, consumption of cakes and sweets was too high in about 25% of the sample, in that a dessert or cake was always consumed at each meal concerning obesity (78,87,93). In contrast to current findings, it might be socio economic status, study setting because previous study conductd in only urban setting and availiablity of information. Adolescents believed that they did not need to be concerned about what they ate as they were still young, with the majority of them being unaware that excess consumption of salt, sugar, and fat can constitute a risk factor for many diseases. They not only lacked knowledge about healthy eating habits but also about the adverse effects of an unhealthy diet, according to study findings in Egypt, France, and Germany,(63,65,95). Possible reasons were easy to access soft drinks from local vendors, easily accessible and ready to be eaten, children and adolescents were more likely to eat them,(44).

For example, in a study involving a very large (N=10,000) population-based sample of adolescents and their parents in the US, Australia, the UK, Ireland, and the Netherlands examined, the findings revealed that those who skipped breakfast most days of the week were significantly more likely to become overweight or obese than the regular breakfast Pakistan(N=1860),(48,96). Several studies consistently related the consumption of breakfast to improvements in academics (test scores and grades). For example, in a study involving e sample consisted of (N=1566) fourth and fifth-grade elementary school students (11–13 teenagers) from polish, it was reported that teenagers who skipped breakfast regularly scored lower marks compared with the regular breakfast eaters (97).

When the study participants in Nigeria, South Africa, Slovenia were asked about their dietary preferences, some indicated that they preferred a soft drink; others preferred sweet foods. (7,39,63,86). Contrary, other studies had reported that most adolescents do not usually eat fruits and vegetables daily, even though unable to meet the World Health Organization (WHO) goal of a daily intake of at least 400 grams of fruit and vegetables (51,69). The findings of this study suggest that might be, fruits are not always available to be bought and consumed by students, because of their high prices and not easily accessible, evidence from the finding that most adolescents are often not eating fruits at home. The meal frequencies observed in our study in the majority 65.1% of students was three meals per day. (71)(11), Studies were conducted in China, Japanese and South Africa 68.8%, 81%, and 87.6% respectively. The current finding was lower than than previous study. The reason for the discrepancy might be the socioeconomic status educational level of respondents and study setting. The present study shows that 45.3% of students know the foods to eat the at least according to the guidelines of United States Department of Agriculture (USDA) United States Department of Health and Human Services (USDHHS) food guide pyramid and South African. Food-Based Dietary Guidelines and Kenya(18.7% and 17.3%) respectively (98,99).

According to these findings mean values of nutritional attitudes score were higher than half of the total score of 65.3%, So it was favorable in both female and male students as a whole. Similarly finding in Malaysia and Kenya revealed high nutrition knowledge are more likely to have positive attitudes about nutrition and attitude plays a significant role in practicing a healthy diet and a positive attitude towards nutrition induce the adolescent to choose healthy food. (28,86,100). In a similar study conducted in Turkey attitudes of female students were determined to be higher than males'(64), might be this differentiation can be due to the age group, environment, socio-cultural structure, and educational factors. A study conducted in Turkey has contradicted to our findings. The reason why there is no change in nutrition knowledge and attitude depending on the number of siblings can be due to the education system, the socio economic, socio-cultural structure. It can be considered that the same kind of living conditions contributed to this result no matter if the numbers of siblings vary or not. The mothers felt that their children mostly consumed fast foods and did not like eating green leafy vegetables, pulses,

and milk. The mothers were aware of the benefits of good nutrition and its role in growth, development, and the prevention of disease,(63)

In this study, parents' occupation had significantly associated with nutritional attitudes. Similarly, other large (N=3922) studies conducted in china's and Ghana had also shown that parent occupation primary school children's eating behavior most differed by levels of parental education, with the students of parents with the lowest education eating behavior scores than students of parents with medium education level (101). The adherence to the Rebels trend was lower, which was around 4times higher in children of mothers with primary education, 2.4 times higher in students with inadequate nutritional awareness, and 1.9 times higher in students from a family. In contrast to our finding adolescent girls whose mothers had no formal education were 8 times (AOR: 7.65, 95% = 3.40, 17.19) more likely to have low dietary diversity scores when compared to adolescent girls whose mothers attended secondary school and above. Adolescent girls who had merchant fathers were 66.1% less likely (AOR: 0.28, 95%CI = 0.08, 0.95) to have a low dietary diversity score when compared to adolescent girls whose fathers were farmers. Adolescent girls who had families in low economic status were two times more likely to have a low dietary diversity score (AOR: 1.87, 95%CI = 1.04, 3.35) when compared to adolescent girls who had families with high economic status(31)

This finding revealed that females adolescent student had more likely to have a favorable attitude when compared to males. This finding aligns with the study conducted in Iwo University, Saudi Arabia, Philippines, and Frances, (46,81,89,102). This variation might be related to individual food selection,food preferences due to psychological factors related to weight gains. Dietary attitude could have an important influence on the health over the longer term. Female attitudes improved with grade level, according to recent research had indicated that adoption and adherence to basic healthy eating guidelines are associated with significantly better health outcomes, findings revealed that higher grade students had an attitude towards nutrition. This finding is consistent with a study conducted in India(103). A similar finding in the Philippines was higher grades had favorable attitudes than lower grades, generally, studies that examined the association between grade level and attitude showed a decline in students' positive attitudes toward as grades increased,(102).

Findings revealed that Parents' educational level should be considered when designing interventions to improve the nutritional attitudes and eating behavior of primary educated when compared to no formal educated. According to a study finding in Turkey were ascertained that eating habits of students living far away from their parents vary; fruit and vegetable consumption decreases while fatty food consumption increases. It is a quite noteworthy point that the nutrition knowledge of students with parents who have higher education levels were higher than those of with primary school. Similarly, analysis for nutrition attitudes and dietary behaviors depending on parents' education levels showed relatively higher nutrition attitudes and dietary behaviors as parents' education levels increased,(64,70,76,104). In contrast, which was slightly different from the studies in Korea in which father's education level did not affect nutrition attitude and dietary behavior of children,(32,85,105) The reason for the discrepancy might be associated with a difference in socioeconomic status, accessiblity,and food availiablity.

6.1. Strength and limitation of the study

The study was school-based, includes both urban and rural primary schools to generalize for the study area. The study assessed only focus quantitatively and not supported by qualitative study; hence, there might be a lack of a correct reflection of the usual dietary knowledge and practices of adolescents.

7. Conclusion And Recommendation

7.1 Conclusion

More than half of adolescent had good nutrition knowledge, favorable attitude, and good practices. Female adolescent students were favorable attitudes towards nutrition and good dietary practices. Nutrition knowledge was needed for better dietary choices. Adolescents were more autonomous and behavioral patterns were acquired during this phase of life. Adolescents had good nutrition knowledge. Knowledge had no association with practices. However, attitude significantly influenced dietary practices. This study concludes that there was a disconnection between nutrition knowledge, dietary practices. School adolescents had money and made independent decisions on what to buy while away from home.

7.2 Recommendation

Nutrition practices is one of the key factors in the prevention of risk factors associated with the early onset of chronic disease. Nutrition education is an effective tool focus on healthy eating. Based on the major findings of the study, the following recommendations have been made that school authorities should design and implement nutrition education programs such as workshops, seminars, and symposia that have the potential to increase adolescents' level of nutrition knowledge and practices.

Finally, parents should be advised during parent-teacher association meetings on the need to provide nutrient-rich food and also educate their districts on the benefits and consequences of poor dietary practices. Government, policymakers, researchers, and school authorities should organize orientation programs for adolescent students to educate them on the consequences of poor dietary practices. This would provide adolescent students with the right information and advice, which will enable them. finally, Suggestions for further research other similar researches to be conducted in areas not having the same characteristics as the study area to investigate factors that influence nutrition knowledge, attitudes, and practices.

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ANNEXES

Annexes I Information sheet

Name of organization: Jimma University Institutes of Health Sciences, Department of Human Nutrition and Dietetics, JU.

Title of research: assessment of nutritional knowledge attitude and dietary practices and associated factors among primary school adolescents (grade 5-8) in Anlemo district in Southern Ethiopia.

Purpose of the research: The main purpose of this research project was to assess Nutritional knowledge attitude and practices and associated factors in primary schools. It reveals baseline data for research and to gives important information to the concerned body for dietary education intervention.

Procedures: Data was collected from primary school adolescents (grades 5-8) through structural questionnaires by data collectors. Permission was obtained from the institution and informed consent from each participant of the study and below the age of 12-17 consent was obtained from guardians. Verbal assent from participants

Benefits: the result, in the end, had direct and indirect benefits to prevent nutritional problems and non-communicable diseases in the community at large.

Risks: By participating in this study, I believe that no risk except the taking of some minutes based on your participation.

Incentives for participation: not an incentive or payment is given to participate in the research project.

Confidentiality: The information collected from this research work is kept confidentially and your name and any your personal identification would not be included in any part of this paper sheet

Right to refuse or withdraw: Your participation is voluntary. You have full right to refuse fully or partially from participating in this research and you can choose not to be responding to the questions and this does not affect you from getting any kinds of health-related services. Contact persons:-If you have any concerns about the study, please contact us….

1. Gezehagn Assefa E-mail: gezehagnassefa2020@gmail.com phone number -0916188479

ANNEXES II: Consent Form

Hello, my name is Gezehagn Assefa I am from Jimma university student of Human Nutrition and Dietetics master's degree. As part of our academic requirements, we are conducting a study of dietary knowledge attitude and practices and associated factors among primary school adolescents (grade 5-8). You are kindly requested to be included in the study which will improve the adolescent's nutritional problems and we would appreciate it if you could complete the enclosed questionnaire. Participation in this study is completely voluntary based. You have full right to decide not to participate in the study. The overall interview may take about 15-20 minutes.

May I continue

1. Yes 2.No

Interview Starting Time----------Ending time----------Date of

interviewing----------

signature----------

Annex III: English Version questionnaire

SECTION I: -questionnaires about background characteristics of the adolescents

Son	Questions	Answers	Code
1	Age	------	
2	Sex	1.male 2.female	
3	Grade	1.5th 2. 6th 3. 7th 4. 8th	
4	Residence	1.urban 2.rural	
5	School place	1. Urban 2.rural	
6	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. others	
7	Educational level of mother	1. unable to read and write 2. Read and write 3. Primary school 4. Secondary school 5. Above the secondary school	
8	mother occupation status	1. Farmer2. Government employee 3. Private 4. Merchant5. daily laborer	
9	The educational level of the father	1. No formal education 2. Read and write 3. Primary school 4. Secondary school 5. Above the secondary school	
10	Occupational status of the father	1. Farmer 2. Government employee 3. Private organization 4. Merchant 5. daily laborer	

SECTION II. Nutrition knowledge questionnaires

1. Which food group should eat the least?

(1) Vegetables and fruits

(2) Bread, Grains, Rice, Pasta, and cereals

(3) Fats, oils, and sweets

(4) Dairy and dairy products

(5) I do not know

2. Which food group should eat the most?

(1) Vegetables and fruits

(2) Bread, Grains, Rice, pasta, and cereals

(3) Fats, oils, and sweets

(4) Dairy and dairy products

(5) I do not know

3. Fat-free foods always mean energy-free?

(1) Yes (2) No

4. Do you know the dietary sources of carbohydrates? (1) Yes (2) No

if you say yes, please list its dietary sources.....

5. Do you know the dietary sources of fat? (1) Yes (2) No

if you say yes, please list its dietary sources.....

6. Do you know the dietary sources of fiber? (1) Yes (2) No

if you say yes, please list its dietary sources.....

7. Do you know the dietary sources of Vitamin C? (1) Yes (2) No

if you say yes, please list its dietary sources.....

8. Do you know the dietary sources of proteins? (1) Yes (2) No

If you say yes, please list its dietary sources …….....

9. Do you know that eating a lot of sugar, sweets and sweet food can make you fat?

(1) Yes (2) No

10. Do you know that eat too much fat you can become fat?

(1) Yes (2) No

11. Do you know a low intake of fruit and vegetables will cause a health problem?

(1) Yes (2) No

12. Do you know the health consequences of absence fiber intake?

(1) Yes (2) No

13. Do you know the health consequence of much consumption of salt?

(1) Yes (2) No

14. Do you know the health consequences of much consumption of fatty foods?

(1) Yes (2) No

15. Do you know eating fruit and vegetables everyday is good for our bodies to prevent the occurrence of a certain disease?

(1) Yes (2) No

16. Do you know that eating a lot of sugar, sweets and sweet food is not good for your health?

(1) Yes (2) No

SECTION III: **Dietary Practices question**

1. Do you usually eat your food with looking at TV and/ listening to FM radio?

(1) Usually (2) sometimes (3) I have eaten my food in front of the TV &listening to the radio

2. Who is your eating companionship?

(1) Eat with family (2) eat with peers/ friends (3) often eat alone

3. What is the average number of cooked meals usually consumed per day?

(1) 1 meal (2) 2 meal (3) 3 meal (4) ≥ 4 meal

4. Do you always eat breakfast before going to school?

(1) Yes (2) No

5. If you say No, which Reasons are attributed to missing breakfast before school?

(1) Breakfast not prepared at home (2) Fear of being late to school

6 Skipping meals is an appropriate way to lose weight?

(1) Yes (2) No

SECTION IV. Attitudes related questions

Please indicate your opinions of the following statements by putting an "X" against "SD"

(1), "D" (2), "N" (3), "A" (4), and "SA" (5) on the spaces provided after each question.

S.N	Questions	SD	D	A	N	SA
1.	We should eat as many different kinds of foods as possible					
2.	One can become sick if they do not wash their hands often					
3.	Learning about food and nutrition issues is enjoyable					

4.	I do not like cleaning the school compound because it makes me tired					
5.	Cooking is an enjoyable task					
6.	All unfamiliar or new foods are unhealthy					
7.	I feel good when I drink boiled water					
8.	I do not have to worry about the kind of foods I eat because I am still young					
9.	Fruits are a healthy snack					
10.	I like learning about nutrition because it has contributed to my knowledge of nutrition					
11.	I prefer meat to vegetables					
12.	I do not believe that frequent brushing of teeth leads to healthy teeth					
13.	Breakfast is important to me					
14.	The taste of food is more important than its nutrient content					
15.	All nutritious foods are expensive					
16.	We can dispose of rubbish anywhere in the compound as long as the teachers are not seeing us					
17.	It is hard to practice the nutrition aspects at home, so I will just study nutrition to pass the examinations					
18.	The school feeding program initiatives are good for me					
19.	Eating of healthy food is only important during illness					

SECTION V: Sources of Nutrition Information

1. From where do you receive information about nutrition issues?

1) Textbooks &Newspapers 2).health professional

3) Family members 4) Friends 5.) Television & Radio

2. Which of the sources mentioned above provide you with the most information? Rank in order of their importance)

3. Which of these three sources of nutrition information do you like most? Give reason for liking each one of them (List in order of

S.no	Source of nutrition information	Reason for liking it

THE END

Thank you very much1!!!!!!!!!

Annex IV: Amharic Version Questionnaire

ባጅማ ዩኒቨርሲቲእንስቲትዩት ኦፊ ሄልዝ የምግብ እና የስርዓተ-ምግብ ትምህርት ክፍል ይህ ወረቀት በሀድያ ዞን በአንሌሞ ወረዳ ለሚካሄድ ጥናታዊ ጽሑፍ መረጃ መሰብሰቢያ ነው።የጥናታዊ ፅሑፉ ዓላማ በወረዳ ውስጥ ባሉ አንደኛ ደረጃ ትምህርት ቤቶች ዕድሚያቸው ከ10-19ዓመት የሆኑ ተማሪዎችን የስርዓተ-ምግብ እዉቀት እና የአመጋገብ ልምድ ላይ ያላቸውን ግንዛቤ ለማ ጥናት ነው።በመጀመሪያ ለቃለመጠየቁ ስለተባበሩኝ አመሰግናለሁ።

ሰላም,ስሜ: ገዘሃኝ አሳፋ ይባላል።ከጅማ ዩኒቨርሲቲ እጩ የማስተር ተመራቂ ተማሪነኝ ። ጥናቱን የምናካሂደው የስርዓተ ምግብ እዉቀት እና የአመጋገብ ልምድን ነዉ። እርስዎ በጥናቱ እንዲሳተፉ የተደረገው መፍትሔ ለመስጠት ነው። ይህ ተሳትፎ የተወሰኑ ደቂቃዎችን(15-20) ሊወስድ ይችላል።ነገር ግን ሌላ ችግር አያመጣበዎትም። በትምህርት ቤት ውጤት ላይም ሆነ በሌላ ችግር አያመጣበዎትም። በጥያቄዎች የመሳተፍም ሆነ ያለመሳተፍ ሙሉ መብት አለዎት።ለተሳትፎዎ ምንም አይነት ክፍያ የለውም።በተሰጡት መጠይቆች ሙሉ በሙሉ ከተሳተፉ ምስገናችን ከፍ ያለ ነው።

"ልቀጥል"?

አዎን ከሆነ ቃለ መጠይቅ ማድረግህን ቀጥል ። ፊርማ----------

አይደለም ከሆነ አመሰግናለሁ እና ቃለ መጠይቅ አቁም

የጀመሩበት ሳዓት---------- የጨረሱበት ሳዓት----------ቃለመጠይቅ

የተደረገበት ቀን----------

ፊርማ----------

ክፍል I. ቅጽ በአማርኛ የተዘጋጀ

ከተጠቀሱት አማራጮች መካከል ደብዳቤውን ከመክበብ ይልቅ መልስ ለማግኘት አንድ ሣጥን መርምር።

እኔ -ስለ ጎረምሶች የኋላ ታሪክ ባህሪያት ጥያቄዎች

ተ.ቁ	ጥያቄዎች	መልሶች	መለያ ኮድ
1	ዕድሜ ------	------	
2	ፆታ	1.ወንድ 2. ሴት	
3	የመማሪያ ክፍል	1 5ኛ ክፍል 2. 6ኛ ክፍል 3. 7ኛክፍል 4. 8ኛክፍል	
4	የትምህርት ቤት ቦታ	1.ከተማ 2.ገጠር	
5	መኖሪያ ቦታ	1. ከተማ 2.ገጠር	
6	ሀይማኖት	1. ኦሪቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ከቶሊክ 5. ሌላ	
7	የእናት ትምህርት ደረጃ	1. መደበኛ ትምህርትያልተማሩ 2. መንባብና መፃፍ የሚችችል 3. የመጀመሪያ ደረጃ 4. ሁለተኛ ደረጃ 5. ከሁለተኛ ደረጃ በለይ የተማረች	
8	እናት የሥረ ሁኔታ	1. አርሶአደር 2. መንግስት ሠራታኛ 3.የቤት እማቤት 3. .የግል ድርጅት 4. ነገዴ5. ቀን ሠራታኛ 6. ሌላ ካላ------	
9	አበት ትምህርት ደረጃ	1. መደበኛ ትምህርት ያልተማረ 2.መንባብና መፃፍ የሚችል 3. የመጀመሪያ ደረጃ 4. ሁለተኛ ደረጃ 5. ከሁለተኛ ደረጃ በለይ የተማረ	
10	አበት የሥረ ሁኔታ	1 አርሶአደር 2. መንግስት ሠራታኛ 3.የግል ድርጅት 4. ነገዴ 5. ቀን ሠራታኛ 6. ሌላ ካላ-------	

ክፍል II. ቅጽ የአመጋገብ ዕውቀት ጥያቄዎች

1. ቢያንስ ከእነዚህ የትኛውን የምግብ ዓይነት/ቡድን ተመግባዋል?

(1) አትክልትና ፍራፍሬ

(2) ዳቦ፣ እህል፣ ሩዝ፣ ፓስታና ጥራጥሬ

(3) ቅባት፣ ዘይቶችና ጣፋጭ ምግቦች

(4) የወተት ተዋጽኦዎች

(5) አላውቅም

2. በብዛት መመገብ ያለበት ከእነዚህ የትኛው የምግብ ቡድን/ዓይነት ነው?

(1) አትክልትና ፍራፍሬ

(2) ዳቦ፣ እህል፣ ሩዝ፣ ፓስታና ጥራጥሬ

(3) ቅባት፣ ዘይቶችና ጣፋጭ ምግቦች

(4) የወተት ተዋጽኦዎች

(5) አላውቅም

3. ስብ ነፃ ምግቦች ሁልጊዜ የኃይል ነጻ ናቸዉ ማለት ነው?

(1) አዎ (2) አይደለም

4. የአመጋገብ ምንጮችን ካርቦሃይድሬት ታውቀዋለህ? (1) አዎ (2) አይደለም

አዎ ከሆነ እባክዎን የአመጋገብ ምንጮቹን ዘርዝሩ.....

5. የስብ አመጋገብ ምንጮችን ታውቀዋለህ? (1) አዎ (2) አይደለም

አዎ ከሆነ እባክዎን የአመጋገብ ምንጮቹን ዘርዝሩ.....

6. የጮረት/Fiber/ አመጋገብ ምንጮችን ታውቃለህ? (1) አዎ (2) አይደለም

አዎ ከሆነ እባክዎን የአመጋገብ ምንጮቹን ዘርዝሩ.....

7. የቪታሚን ሲ የአመጋገብ ምንጮችን ታውቀዋለህ? (1) አዎ (2) አይደለም

አዎ ከሆነ እባክዎን የአመጋገብ ምንጮቹን ዘርዝሩ.....

8. የፕሮቲን አመጋገብ ምንጮችን ታውቃለህ? (1) አዎ (2) አይደለም

አዎ ከሆነ እባክዎን የአመጋገብ ምንጮቹን ዘርዝሩ.....

9. ብዙ ስኳር፣ ጣፋጭ ምግብና ጣፋጭ ምግብ መመገብ ስብ ሊያደርግልህ/ሺ የሚችል ይመስላሃል/ሻል?

(1) አዎ (2) አይደለም

10. ብዙ ስብ መብላት ስብ መሆን የሚችል ይመስልሃል?

(1) አዎ (2) አይደለም

11. የፍራፍሬና አትክልት መጠን አነስተኛ መሆኑ የጤና ችግር እንደሚያስከትል ታውቃለህ?

(1) አዎ (2) አይደለም

12. የፍራፍሬና አትክልት አለመኖር የሚያስከትለውን የጤና መዘዝ ታውቃለህ?

(1) አዎ (2) አይደለም

13. ብዙ ጨው መመገብ በጤና ላይ የሚያስከትለውን ውጤት/መዘዝ ታውቃለህ?

(1) አዎ (2) አይደለም

14. የቅባት ምግቦችን በብዛት መመገብ በጤና ላይ የሚያስከትለውን መዘዝ ታውቃለህ?

(1) አዎ (2) አይደለም

15. በየዕለቱ አትክልትና ፍራፍሬ በመመገብ ሰውነታችን በሽታን እንደምከለከል ታዉቃለህ?

(1) አዎ (2) አይደለም

16. ብዙ ስኳር፣ ጣፋጭ ና ጣፋጭ ምግብ መመገብ ለጤና ጠቃሚ እንዳሆነ ታዉቃለህ?

(1) አዎ (2) አይደለም

<u>ክፍል III.ቅጽ የአመጋገብ ልምዶች ጥያቄዎች</u>

1. አብዛኛውን ጊዜ ቲቪ ስትመለከትና/ ራዲዮ ስታዳምጥ ነዉ ምግብህን/ሽን የምትበላው/ይዉ?

(1) አብዛኛውን ጊዜ (2) አንዳንድ ጊዜ (3) በጭራሽ

2. ከማን ጋር ምግብ መብላት ነዉ የምትወዳዉ/ጂዉ?

(1) ከቤተሰብ ጋር (2) ከእኩዮች/ ጓደኞች ጋር (3) ብዙ ጊዜ ብቻዬን 4. ሌላ ከላ----------

3. አብዛኛውን ጊዜ በቀን የሚትመገበው ምግብ በአማካይ ምን ያህል ነው?

(1) 1 ማዕድ (2) 2ማዕድ (3) 3ማዕድ (4) ≥ 4ማዕድ

4. ወደ ትምህርት ቤት ከመሄድህ/ሽ በፊት ሁልጊዜ ቁርስ ትበላላህ/ሽ?

(1) አዎ (2) አይደለም

5. መልሶዎ አይደለም ከሆና ከትምህርት ቤት በፊት ቁርስ የጠፋባቸው ምክንያቶች የትኞቹ ናቸው?

(1) እቤት ውስጥ ቁርስ አይዘጋጅም (2) እንዳይረፈድብኝ ፈሪቼ 3). ብዙም ጠቃሚ ስላልሆነ 4). ፍላጎት ስላሌለኝ 5). ሌላ ከላ---------

6. ምግብ አለመመገብ ክብደት ለመቀነስ ጠቃሚ ዘዴ ነው ?

(1) አዎ (2) አይደለም

ክፍል IV. በአመጋገብ ላይ ያሉ አመለካከቶች

እባክዎ "SD" ላይ "X" በማስቀመጥ የሚከተሉትን መግለጫዎች አስተያየትዎን ያመላክቱ

ተ.ቁ	ጥያቄዎች	በጣም አልስማማም	አልስማማም	አይመለከተኝም	እስማማለሁ	በጣም እስማማለሁ
1	በተቻለ መጠን የተለያዩ አይነት ምግቦችን መመገብ ይኖርብናል					
2	አንድ ሰው ብዙ ጊዜ እጁን ካልታጠበ ሊታመም ይችላል					
3	ስለ ምግብ እና ስነ ምግብ ነክ ጉዳዮች መማር አስደሳች ነው					
4	ስለሚያደክመኝ የትምህርት ቤቱን ግቢ ማጽዳት አልወድም					
5	ምግብ ማብሰል አስደሳች ስራ ነው					
6	ሁሉም እንግዳ ያልሆኑ ወይም አዳዲስ ምግቦች ጤናማ ያልሆኑ ናቸው					
7	የተፈላ ውሃ ስጠጣ ደስ ይለኛል					
8	ገና ወጣት ስለሆንኩ ስለምበላው አይነት ምግብ መጨነቅ አያስፈልገኝም					

9	ፍራፍሬዎች ጤናማ ምግብ ናቸው					
10	በአመጋገብ ረገድ ያለኝን እውቀት አስተዋፅኦ ስላበረከተ ጤናማው የመማር ማስተማር ፕሮግራም አቀንቃኝ ደስ ይለኛል					
11	ከአትክልት ይልቅ ስጋን እመርጣለሁ					
12	ጥርስን በተደጋጋሚ መቦረሽ ወደ ጤናማ ጥርስ ያመራል ብዬ አላምንም					
13	ቁርስ ለእኔ በጣም አስፈላጊ ነው					
14	የምግብ ጣዕም ከንጥረ ነገር ይዘቱ ይበልጥ አስፈላጊ ነው					
15	ሁሉም ገንቢ ምግቦች ውድ ናቸው					
16	መምህራኑ የማያዩን እስከሆነ ድረስ በግቢው ውስጥ በየትኛውም ቦታ ቆሻሻ ማስወገድ እንችላለን					
17	በቤት ውስጥ የተመጣጠነ ምግብ ነክ ጉዳዮችን ለመለማመድ ይከብዳል ስለዚህ ምርመራውን ለማለፍ አመጋገብን ብቻ እያጠናለሁ					
18	የትምህርት ቤቱ የምግብ ፕሮግራም ያዘጋጀው ምሳ በቂ ነው					
19	ጤናማ ምግብ መመገብ አስፈላጊ የሚሆነው በህመም ጊዜ ብቻ ነው					

<u>ክፍል V. የተመጣጠነ ምግብ መረጃ ምንጭ</u>

1. ስለ አመጋገብ ጉዳዮች መረጃ ከየት ተጋኛላችሁ?

1) ከትምህርተ ትምህርት 2). ከጤና በለሙያ 3). ከቤተሰብ. ጓደኞች 4) ቴሌቪዥንነ ራድዮ 4. ሌላ (ግለጽ).....

2. ከላይ ከተጠቀሱት ምንጮች ውስጥ ከሁሉ የበለጠ መረጃ የሚሰጥህ የትኛው ነው? በአስፈላጊነታቸው ቅደም ተከተል ደረጃ) .....

3. ከእነዚህ ሦስት የአመጋገብ መረጃዎች ውስጥ ይበልጥ የምትወዱት የትኛውን ነው? እያንዳንዳቸውን ለመውደድ ምክንያት ስጡ (ዝርዝር ቅደም ተከተል----------

ተ.ቁ	የመረጃ ምንጭ	የወደድክባት ምክንት

Annex 3

Table 9. Attitudes towards food choice, preparation, and food consumption among primary school adolescents in Anlemo District, Hadiya Zone Southern Ethiopia(n=596)

	Grade 5					Grade 6					Grade 7					Grade 8				
Attitudes	SD%	D%	N%	A%	SA%	SD%	D%	N%	A%	SA%	SD%	D%	N%	A%	SA%	SD%	D%	N%	A%	SA%
Cooking is an enjoyable task	11.2	3.18	0	9.2	0	10.5	5.5	0	9.3	0	9.2	9	0	6.2	0	7.5	7.2	0	11.2	0
All unfamiliar or new foods are unhealthy	3.3	2.6	0	17.6	0	2.6	2.5	0	20.4	0	0	.5	0	24	.16	.3	.5	0	25.3	0
I do not have to worry about the kind of foods I eat because I am still young	7.2	8.9	0	5.8	1.6	7.3	8.7	0	6.7	2.7	6	6	0	7.3	5	5	12	0	4	5
I prefer meat to vegetables	12.4	8.3	0	2.18	.67	16.8	6.9	0	1.1	.7	15	6	0	1.5	2.3	12	9.3	0	2.18	1.8
The taste of food is more important than its nutrient content	5	4	0	10.5	0	4.5	4.4	0	15.6	0	4.3	3	0	13	0	3.5	3	0	18.2	0
Breakfast is important to m	9.3	7.3	.0	2.7	3.9	7.8	8	0	4	5.7	8.5	5.7	0	5.1	5	7.7	9	0	2.1	7.2
Eating of healthy food is only important during illness	3.9	8.5	.00	9.4	1	4.8	4.6	0	15.6	.33	6.7	5	0	11	.5	3	9.4	0	13	0
All nutritious foods are expensive	6.7	3.1	0	9	0	5.7	4.3	0	16	0	4.3	3	0	13	0	4	5.2	0	13	0

Table 10: Attitudes towards learning about nutrition among adolescent in Anlemo District, Hadiya Zone Southern Ethiopia(n=596)

	Grade 5					Grade 6					Grade 7					Grade 8				
Attitudes	SD %	D %	N %	A %	SA %	SD %	D %	N %	A %	SA %	SD %	D %	N %	A%	SA %	SD %	D %	N %	A %	SA %
Learning about food and nutrition issues is enjoyable	16.2	3.1	0	1	4	18.4	2.18	0	2.6	2.3	18.2	2.85	0	1	2.3	16.3	8.3	0	.3	1.8
It is hard to practice good nutrition at home, so I will study just to pass the examination	7.2	3.2	0	8.3	0	7.2	5.7	0	12	0	6.7	4.7	0	9.5	0	8.2	3.8	0	12	0

Table 11: Adolescent attitudes on hygiene and sanitation among adolescent in Anlemo District, Hadiya zone Southern Ethiopia (n=596)

	Grade 5					Grade 6					Grade 7					Grade 8				
Attitudes	SD %	D %	N %	A %	SA %	SD %	D %	N %	A %	SA %	SD %	D %	N %	A %	SA %	SD %	D %	N %	A %	SA %
We can dispose of rubbish anywhere in the compound as long as the teachers are not seeing us	4.5	4.8	0	9.4	0	4.4	5.4	0	16	0	4.8	3.9	0	12.2	0	3.5	4.8	0	15	0
One can become sick if they do not wash their hands often	3.5	7.2	0	6.2	4.4	6.7	6.2	0	1.2	7.9	6.2	5.6	0	7.6	4.3	4.4	8.6	0	7.8	3.5
I do not believe that frequent brushing of teeth leads to healthy teeth	11.2	9.2	0	3	0	15	7.2	0	3.5	0	14	6.2	0	3.9	0	13	8.6	0	4.3	0
I do not like cleaning the school compound because it makes me tried	7.1	3.9	0	13	0	10	3.9	0	12	0	4.4	4.5	0	15.7	0	3.6	1.8	0	21	0
I feel good when I drink boiled water	2.8	.16	0	20	0	1	1	0	24	0	.83	0.3	0	23	.16	.5	.6	0	25	0