ADDIS ABABAUNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

DEPARTMENT OF PREVENTIVE MEDICINE

FAMILIAL CORRELATES OF ADOLESCENCE OBESITY AMONG PRIMARY SCHOOL ADOLESCENTS IN HAWASSA TOWN, SOUTHERN ETHIOPIA: SCHOOL BASED CASE CONTROL STUDY

BY

MEDHIN GETA (BSc)

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN PUBLIC HEALTH EPIDEMIOLOGY AND BIOSTATISTICS

OCTOBER, 2017

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STATEMENT OF THE AUTHOR

I hereby declare that this thesis is my original work and that all sources of materials used for this thesis and all people and institution who gave support during this thesis work have been duly acknowledged. This thesis has been submitted in partial fulfillment of the requirements for MPH degree at Addis Ababa University and is deposited at the University Library to be made available to borrowers under the rules of the library. I earnestly declare that this thesis is not submitted to any other institution anywhere for the award of any academic degree, diploma, or certificate.

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ACRONYMS

AAU ---------- Addis Ababa University

CFP ---------- Child Feeding Practice

CFPQ ---------- Child Feeding Practice Questionnaire

CI ---------- Confidence Interval

CSA ---------- Central Statics Agency

CVD ---------- Cardiovascular Disease

ECHO ---------- Ending Childhood Obesity

EDHS ---------- Ethiopian Demographic Health Survey

IOTF ---------- International Obesity Task Force

IQR ---------- Inter-Quartile Range

MVPA ---------- Moderate to Vigorous Physical Activity

AOR ---------- Adjusted Odds Ratio

PA ---------- Physical Activity

PPS ---------- Probability Proportional to Size

SD ---------- Standard Deviation

SPSS ---------- Statistical Package for Social Sciences

TSFT ---------- Triceps Skin Fold

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Abstract

Background: Obesity epidemic and its consequences are now rapidly spreading in the developing countries including Ethiopia, especially in the affluent urban population. Obesity significantly elevates the risk of CVD, diabetes, insulin resistance and other metabolic disorders. There is a research gap on association between family based factors and obesity among primary school adolescents in Ethiopia.

Objective: the main objective of the study was to assess familial correlates with obesity among primary school adolescent in Hawassa town.

Methods: Institution based case control study was conducted from August, 2016 to November 2017 among 300 primary school adolescents aged 12–15 years in Hawassa town, southern Ethiopia. Study participants were selected using stratified multistage sampling from the schools by ownership as public and private primary schools. Parents were approached through their children. Body mass index was assessed to identify the cases (obeses) and controls (non obeses) using standardized techniques and WHO 2007 BMI-for-age classification. Interviewer administered structured questionnaire was used to collect the respondent‟s exposure to several familial risk factors. Bivariate and multivariate logistic regression analyses were conducted by using STATA version 14 statistical software. Odds ratio with 95% confidence interval was calculated to assess the strength of associations.

Results: A total of 100 cases and 200 controls were included in the analysis. After adjusting for potential confounders, children from overweight parents were about 13 times more likely to be obese compared to children with normal weight parents[AOR of 13.27, 95%CI (3.67-47.9)] and children from obese parents were about 32.4 times more likely to be obese compared to children with normal weight parents [AOR of 32.4, CI (8.1-130.4)]. In addition, income with corresponding AOR of 3.48, 95%CI (1.39 – 8.74), fathers‟ age (AOR of 0.14, 95%CI (0.03 – 0.79), mothers‟ education (AOR of 0.22, 95%CI (0.08 – 0.61), home availability of vegetables [AOR of 4.45, CI (1.67 – 11.89)], family meals frequency [AOR of 4.09 CI (1.64-10.2)], number of TV in the home[AOR of 22.34, CI (7.75 – 64.43], child feeding responsibility and monitoring level of the parents‟ were independently associated with childhood obesity.

Conclusion: The current study findings showed that parental obesity history, parent child feeding practices, family home environment and parental role modeling behaviour are the most important determinants for adolescent obesity in this population. In the schools and family based

health education program to increase awareness on these risk factors, parents should be taught about what a healthy weight is and a right body image for their children and correct use of growth charts or any valid charts helping monitoring child weight status in schools and different settings should be encouraged in order to reduce the future burden of obesity-associated chronic diseases.

1. Introduction

1.1. Background of the study

Obesity is defined as a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health may be impaired(1, 2). The World Health Organization (WHO) classifies overweight/obesity as the fifth leading cause of global mortality, and one of the greatest health challenges and determinants for various chronic diseases such as heart disease, hypertension, diabetes, and psychosocial problems, in the 21st century (3). It is predicted that, by 2020, more than 60% of diseases and their related mortality and morbidity in the developing countries will be due to non-communicable diseases, for many of which obesity is a potential risk factor (4). As the World Health Organization reference 2007 definition, adolescents‟ overweight is defined as a BMI-for-age z-score greater than+1SD and obesity BMI-for-age z-score greater than +2SD. Childhood and adolescent obesity poses a major public health problem in so far as adult diseases manifest themselves already during childhood. However, most low- to middle income countries are subjected to both excesses and deficiencies of nutrients, obesity prevalence has escalated rapidly in almost all counties that would put populations of most countries at risk of developing non-communicable diseases(2). The worldwide obesity epidemic and the ensuing co-morbidities not only threaten individual health and longevity, but also burden insurances and public budget (1). Along this trend, obesity among children increased sharply both in developed and developing countries.

1.2. Statement of the problem

School children and adolescent obesity epidemic and its consequences are now rapidly penetrating the developing countries including Ethiopia, especially in the affluent urban population. The increasing prevalence of childhood obesity poses a major threat to public health. Childhood and adolescence obesity is the major risk factor for several chronic non-communicable diseases which are the leading causes of premature morbidity and mortality. About 2.8% of deaths worldwide are associated/ attributed with overweight and obesity(1, 5).

In Ethiopia major cities, prevalence of obesity in primary school children reaches a particularly high level. A study conducted in Addis Ababa in 2016 reported that the overall prevalence rates of overweight/obesity is 13.9% with overweight and obesity being 9.7% and 4.2% respectively(6) and in 2014, among high school adolescents, the prevalence of overweight and obesity was 9.4% and 7.2%, respectively (7). In Adama town in 2016**,** the study found that the overall prevalence of overweight and/or obesity was 10.3%, with 8.5% overweight and 2.3% obese; underweight was 19% (8, 9).

The study conducted in 2013 among high school adolescents in urban communities of Hawassa, Southern Ethiopia showed that the prevalence of overweight children was 12.9% and the prevalence of obesity was 2.7% based on age and sex specific BMI classification; while based on TSFT it was 11.0% and 3.8% respectively(10); and another study in 2014 showed the combined prevalence of 10.7%, with the specific prevalence being 7.3% and 3.4%, respectively(11). Study conducted in Bahir Dar city, in 2015, indicated the combined prevalence of 16.7% and the magnitude of overweight and obesity were 12.3% and 4.4%, respectively, with underweight being 8.6% (12). Study done in Gondar town in 2013 revealed that the overall prevalence of overweight and obesity was 5.4% and 0.5%, respectively and from private schools was 10.1% and was higher than government schools (4%) (13).

However, obesity is not an immediately lethal disease itself, but has a significant risk factor associated with a range of serious non-communicable diseases in any age level. Hypertension, hypercholesterolemia, type-2 diabetes mellitus, gall bladder disease, non-alcoholic fatty liver diseases, renal disease, asthma, mental health concerns and orthopaedic disorders have been linked to obesity. Obesity also contributes to psychosocial stigma, low self-esteem and low school performance in children. Half of the overweight and obese Central European children studied did show adverse cardiovascular risk factors before or at onset of puberty, at a mean age of 12.6±2.8 years (6**).**

Obesity in school children is associated with multiple factors. It mainly influenced by individual‟s lifestyle factors like dietary habit, physical activity. It is commonly agreed that diet and physical activity are two major factors contributing to weight gain in both adults and children. In children, feeding patterns also play a role in weight gain. Many dietary patterns and eating behaviors such as food choice and eating patterns of children appear to be a function of individual, environmental, and social influences, including influences from parents, schools,

mass media, and cultural norms are identified as risk factors that influence the energy intake and promote obesity development.

In Ethiopia, nearly 41% of children < 5 years are suffering from malnutrition(14). However, in recent years, multiple factors such as rapid urbanization, continually decreasing number of play grounds, increasing purchasing power, and easy access to new technological devices such as hand-held computer and phones probably have led to less physical activity and more sedentary activity, and thereby have attributed to an emerging overweight and obesity problem among young children in urban settings, especially among affluent families in main cities like Hawassa (10, 11, 15). Though there is a dramatic increase of prevalence of obesity among children in urban affluent communities of major cities in Ethiopia, this is the first study which focuses on the parental determinants of childhood obesity in relation to child‟s family environment and child feeding attitudes & practices of the parents among primary school children.

Based on a literature review, several aspects were identified through which parents may exert impact on children‟s eating behavior and weight status. High parental concerns about their child‟s weight can lead to controlling feeding strategies which, as some research has suggested, may interfere with the child‟s self-regulation strategies. Therefore, such practices may increase risk of overweight in children. Physical activity and food environment at home created by parents also can be seen as reflections of parents‟ child feeding strategies, have strong influence on children‟s eating and weight status. The food environment at home should be assessed along with parents‟ child feeding attitudes and modeling behaviors. In addition, parental control of their children‟s eating with appropriate discussion about eating and weight issues can yield positive influence on children‟s energy intake and their weight status.

Studies conducted to assess parental influence on children‟s eating behavior and adiposity mainly focuses on Western populations. There is little known among African populations, especially among Ethiopian. With a rapid social and environmental change in Ethiopia, family and parental influence on children‟s eating needs to be examined in detail. What role do parents play in shaping their child‟s eating? Is there any relationship among parents‟ child feeding attitude & practices and children‟s weight status? What is the influence of the home food environment created by parents on their children‟s weight? These are unanswered problems need to be revealed in order to combat the obesity epidemic among Ethiopian children.

1.3. Significance of the study

Recently there has been some disagreement about the role of controlling practices in the development of overweight (18), with some studies finding either no association (17) or a protective relationship between controlling practices and overweight (19). The majority of this research however has relied on cross-sectional or infrequent longitudinal assessment and has not been able to assess whether monitoring or control is a cause of or response to child size (20). However, longitudinal studies with comparison groups provide the strongest evidence for causality, comparison group designs in which normal weight children are included, shed light on obesity-specific challenges. Studies that include a normal weight comparison group contribute to the understanding of how the domains of family life contribute to child and adolescent obesity over and above the normative challenge of raising children. Ethical challenges in conducting the study targeted at obese children only, and the possibility of causing psychosocial stigmas by such an approach is also minimized by including a normal weight comparison group. Studying variables that have consistently produced mixed results across existing studies and variables not easily assessed accurately through self-report, such as interpersonal dynamics and bi-directional associations may be more assessable through direct observational methods. Identifying causal pathways will also provide a stronger evidence-base for building obesity prevention and treatment programs targeting childhood and adolescent obesity.

Examining the effects of different familial factors that would be associated with adolescent obesity, is important to ascertain which practices should be recommended to parents to prevent adolescent obesity. It has been claimed that there is an urgent need to know whether the effects of parenting practices are similar across different groups of children (21). The cultural effect, the knowledge on healthy dietary habit, attitudes and child feeding practices of the parents may influence children‟s weight status more than individual factors in Africa, particularly in Ethiopia. If such factors as parents‟ child feeding practices that seem to be relevant in western countries would be relevant in developing countries with different socio-cultural structures, such as Ethiopia. There is research gap which focused on the influence of family (parents) based factors on adolescent obesity by using comparison groups in Sub Sahara Africa, including Ethiopia. High prevalence in the study area indicates that it is an emerging problem given the rapidly increasing urbanization and changes in lifestyles and dietary habits.

1.4. Justification of the study

Genetic factors, socioeconomic and macro environmental factors are the focus of most current studies of childhood obesity. Parental role modeling and family home environment related to child healthy eating and exercise have not been adequately researched. Though an increasing body of research focuses on parents‟ child feeding styles and obesity development among children, relationships between children‟s weight status and parents‟ child feeding strategies are inconclusive. Yet, it seems evident that parents, as a key agent in the family, have profound influence on children‟s health in various ways. Parents shape children‟s food preference and eating behaviors through their own attitudes, practices, behaviors and family home environment they create. Yet, those aspects have not been well understood, especially in many developing countries like Ethiopia. To curb the rising obesity epidemic in Ethiopia before it is too advanced, factors contributing to the problem need to be better understood. Factors related to eating behavior and energy intake have been identified within the family. However, little data are available for analysis of family influence on children, especially, primary school children in developing countries. Primary School children and early adolescents are in a transition to autonomy. However, their foods are primarily prepared and provided by their parents and their eating behaviors mainly take place within the family. Parents‟ influence on their eating remains strong during childhood and early adolescence. It is also not known if factors such as parents‟ child-feeding practices that seem to be relevant in western countries are relevant in developing countries with different ethnic and socio-cultural structures, such as Ethiopia.

While it is generally agreed that, school-age children's dietary habits are influenced by personal and environmental factors, literature and research on associations aimed at parental factors in the family home environment are lacking in Ethiopia. This study was aimed to capture an association of adolescence obesity within a rapidly changing environment and socioeconomic & demographic background of parents. This finding will provide some picture of familial factors in a modern Ethiopian family in relation to children weight status. Such information would help better understand the role of parents and family home environment in development of children and adolescents obesity prevention and provide insights for intervention in Ethiopian population.

2. Literature Review

This chapter provides evidences of different studies on childhood obesity and its associated factors. It clearly discusses different literatures related to childhood obesity and different contributing factors associated with it.

Excessive weight gain occurs when energy intake exceeds energy expenditure. Obesity is defined as a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health may be impaired (22). As the World Health Organization reference 2007 definition, children & adolescent overweight is defined as a BMI-for-age z-score greater than +1SD and obesity BMI-for-age z-score greater than +2SD. Obesity in children poses a major public health problem in so far as adult diseases manifest themselves already during childhood(2).

2.1. Obesity Epidemic in primary school adolescents

Adolescents‟ obesity is considered a major issue because of its high prevalence and because of its severe consequences on adult health. During the last several decades, prevalence of obesity has dramatically increased among both adults and children (22). Prevalence studies carried out in many parts of the world have shown that the world is experiencing an alarming increase in prevalence of childhood overweight and obesity (23). The worldwide prevalence of childhood overweight and obesity increased dramatically from 4.2 % in 1990 to 6.7 % in 2010, (22, 24).
Globally a total of 42 million children under the age of five were estimated to be overweight or obese in 2010 and 92 million were at risk of overweight. A high proportion of this burden (35 million children) was borne by developing countries (25). The estimated prevalence of childhood overweight and obesity in Africa in 2010 was 8.5 % (26), while that of Asia was 4.9 % and Latin America and Caribbean was 6.9 %. This trend is expected to reach 9.1 % (60 million) worldwide and 12.7 % in Africa in 2020 (27).

In Ethiopia major cities, prevalence of obesity in school children reaches a particularly high level. A study conducted in Addis Ababa in 2016 reported that the overall prevalence rates of overweight/ obesity 13.9% as overweight 9.7% obesity 4.2% (6) and in 2014 among high school adolescents the prevalence of overweight and/or obesity was 9.4% and 7.2%, respectively (7). In central Ethiopia, Adama town in 2016**,**the study found that the overall prevalence of overweight and/or obesity was 10.3%, with 8.5% overweight and 2.3% obese; underweight was 19% (9).

The study conducted in 2013 among high school adolescents in urban communities of Hawassa, Southern Ethiopia showed that the prevalence of overweight was 12.9% and the prevalence of obesity was 2.7% based on age and sex specific BMI classification while based on TSFT was 11.0% and 3.8% respectively(10) and another study in 2014 showed the combined prevalence of 10.7%, with the specific prevalence being 7.3% and 3.4%, respectively(11). Another study conducted in Bahir Dar city in 2015, indicated the combined prevalence was 16.7% and the magnitude of overweight and obesity were 12.3% and 4.4%, respectively, and underweight was 8.6%(12). Study done in Gondar town in 2013 revealed that the overall prevalence of overweight and obesity was 5.4% and 0.5%, respectively and from private schools was 10.1% and was higher than government schools (4%)(13). Generally, those studies showed us the presence of high prevalence of child obesity in different part of Ethiopia.

2.2. Factors associated with adolescents obesity

Factors associated with adolescents‟ overweight/obesity are multifactorial and included those modifiable and non-modifiable risk factors. Modifiable causes include physical inactivity, sedentary life style, unhealthy eating habits, family socioeconomic status, and environmental factors (28). The common non-modifiable cause of obesity is genetics, with greater risk of obesity found in children of obese and overweight parents, even though, moderated by other factors(29).

2.2.1. Family or parents related factors

2.2.1.1. Parents socio economic & demographic background

As reported by different studies in developed countries, having parents who are both overweight is associated with an increased risk of child obesity compared with having parents who are both normal weight. The association between the mother‟s BMI and child‟s BMI was stronger than the association between the father‟s BMI and child‟s BMI (24, 30, 31). This evidence supported the hereditability of a genetic predisposition to obesity, but the lifestyle of the whole family as to what, when, and how they eat can be decisive for the onset of their children‟s overweight and obesity(28, 32, 33).

2.2.1.2. Parents' child feeding attitude & practices

Parents use a variety of strategies to influence children‟s eating habits, some of which are counterproductive. Overcontrol, restriction, pressure to eat, and a promise of rewards have negative effects on children‟s food acceptance. Parents‟ food preferences and eating behaviors provide an opportunity to model good eating habits (29, 34, 35).

Another relevant correlation was parents‟ concern about child weight as parents are increasingly aware that obesity in childhood is a risk factor for obesity in adulthood, and thus poses risk for serious health consequences later in life (29, 36), it was not surprising to find associations between parents‟ concern about their child‟s weight and the child‟s problematic obesity-related behaviors(29).

Maternal restriction can also promote overeating, especially in daughters(34, 37). However, it has not been established if restriction does in fact increase the child‟s weight (38) or if it is a logical response to the child‟s overweight. Studies with comparison groups and longitudinal prospective designs on children‟s eating behavior and parenting practices around eating are needed to further clarify this process.

2.2.1.3. Family home environment and parental role-modeling

The relation between home environment characteristics and child behavior, the study conducted by Spurrier et al correlated the habits of parents and children with physical activity and dietary quality. The development of children‟s food preferences involves a complex interplay of genetic, familial, and environmental factors. There is evidence of a strong genetic influence on appetite traits in children, but environment plays an important role in modeling children‟s eating behaviors (39).

There is evidence that the food environment that parents create at home shapes children‟s food preferences and food-acceptance patterns, such that availability and exposure to foods can affect children‟s food selections and intakes(17, 23). Concerning food habits, there was a strong positive association between the amount of fruit and vegetables available at home and higher fruit and vegetable intakes of children; in contrast, greater quantities of fruit juice and breakfast bars kept in the home were associated with lower fruit and vegetable intakes(28, 40-42).

Due to unsafe roads (traffic, crime) children are discouraged from walking or cycling to school(43). Motorized vehicles are popular and they are perceived to be quicker and safer for transport. Inadequate play areas due to lack of open spaces, both at schools and residential areas in cities like Addis Ababa, for exercise and lack of parental time and knowledge to supervise play are all part of new obesogenic lifestyles(15, 28).

The few studies that have investigated associations between such factors and fruit and vegetable consumption in preschool children found positive associations with parental fruit and vegetable intake (35) and parental role-modeling (29); and negative associations with eating in front of the television (35) and parental pressure to eat (41). However, only a minority of these studies have used both a comprehensive or validated assessment of child fruit and vegetable consumption and multivariate analyses to isolate the effect of individual variables and control for the influence of socio-demographic characteristics (23, 42).

Few associations were observed between family environment factors and the odds of girls successfully improving their physical activity, TV use or soft drink or fruit and vegetable intake. However, having a family environment that encourages television use, including girls having a television in their bedroom (odds ratio (OR) of 0.56,P= 0.036 and parents watching higher amounts of television OR of 0.53,P= 0.026, was associated with girls being less likely to decrease their television use. The large majority of the family environment factors were not associated with girls‟ successful BMI or body composition change (33).

2.2.2. Adolescents behaviour related factors

2.2.2.1. Adolescents demographic background

Feeding program of previously malnourished populations to accumulate fat more intensely in an attempt to store for future starvation (44, 45). Stunting (short height for age) in childhood may increase the risk of central obesity especially in transitional economies (46). High rate of gestational diabetes in pregnant women causing higher birth weights in babies leading to inter-generational effects of obesity in children and its attendant‟s problem (25).

2.2.2.2. Adolescents' dietary intake & activity related behaviour

Modifiable risk factors, specifically for children, include lack of regular exercise, high frequency of television viewing or computer usage, low family income, non-working parents, overconsumption of high-calorie foods, snacking while watching television or doing homework and over-exposure to advertisement of high calorie foods.

Sedentary pursuits such as TV and movie watching, video games, internet gazing and telephone gossip sessions are now important activities of children. TV also affects by heavy marketing of colas (a sweet carbonated drink) and other fatty foods (23, 28, 47, 48). The number of TV channels (particularly free satellite TV channels in this country) and telephone connections are touted as indices of development for example**,-"***Kana Wuste Newu***"**

Prolonged and exclusive breast feeding is associated with a significantly lower rate of obesity and hypertension in later life (49). It is not clear if early introduction of energy dense supplements in infancy has contributed to childhood obesity in Ethiopia.

Although not strictly a property of food itself, the extent to which a food is familiar has a strong effect on its acceptability. For many children and some adults, unfamiliarity is a reason to avoid a novel food. Children like what they know, and they eat what they like. From the very earliest age, children‟s experiences with food influence both preferences and intakes, and research suggests that the earlier and broader experiences with food are, the healthier is the child‟s diet. Giving a novel food a familiar flavor (e.g, adding tomato ketchup) can also increase a child‟s willingness to try it (16, 21).

There is an innate preference for high-energy foods; therefore, children and adults, on instinct, choose energy-dense foods that are rich in fat and low in fibers, relatively satiating, and able to give pleasant feelings of fullness that result from consuming them. The higher intake of sweetened beverages was correlated with routine home meals in front of the television, less frequent family meals, and the use of food as a reward for good behavior (18, 20, 35, 50, 51). The high glycemic index of our predominantly carbohydrate diet may be responsible for hyperinsulinism, weight gain and eventual type-2 diabetes (52-54).

2.3. Health impacts of overweight and obesity

Obesity in children & adolescents is associated with a wide range of serious health complications and an increased risk of premature onset of illnesses; including diabetes and heart disease. According to WHO/FAO (2003), 60% of children who are overweight have at least one additional risk factor for CVD, such as hypertension, or hyperinsulinemia. Obese children are at increased risk of type-2 diabetes, previously considered an adult disease. The health problems associated with obesity in adults are well known and include: diabetes, hypertension, stroke, CVD and some form of cancers. The higher the weight the greater the risk of developing any of these conditions (30, 49, 53-56).

2.4. Conceptual Frame Work

Unlike, that of most infectious diseases with single causative agent, the etiology of childhood obesity is complex and multi-factorial. Socio demographic, dietary and physical activity related behavioral factors are involved, and may serve as useful indicators of specific groups at risk of becoming overweight or obese. While each of these factors influences the development of childhood obesity, they are not necessarily dependent on each other but may be moderator of one another (Annex 1).

2.5. Research Questions

In order to examine the associations between the familial factors and weight status of primary school children, the following questions were been considered as relevant based on the literature.

1. What is the relationship between parents‟ child feeding attitude & practice and their child‟s actual weight status?
2. What is the relationship between energy balances related family home environment and children‟s weight status?
3. Which familial factor strongly associated and predicts children‟s weight status? (After taking adolescents related factors into account.)

Study Hypothesis

HO: No association between exposure to selected familial factors and adolescence obesity.

HA: There is any association between exposure to familial factors and adolescence obesity.

3. Objectives

3.1. General objective

The main objective of this study was to assess the association between parents reported energy balance related familial factors and obesity among primary school adolescents in Hawassa Town, Southern Ethiopia, 2017.

3.2. Specific objectives

- To assess the associations between dietary intakes related family environment factors and adolescents obesity.
- To investigate the associations between physical activities related family environment factors and adolescents obesity.

4. Methods and Materials

4.1. Study design and Area

Institution based unmatched case control study was conducted from August 2016 to November 2017 among public and private primary school adolescents at Hawassa city. Hawassa, a capital city of SNNPR and Sidama Zone, is 273 km south of Addis Ababa. The city administration has a total area of 157.2 sq. kms divided in to eight sub cities and 32 kebeles. In the city administration, totally there are 112 primary schools (1- 8 grade), of which 41 are governmental while the rest 71 are non-governmental schools. According to 2011 Central Statistical Agency of Ethiopia (CSA) estimates, the city has a total population of 292,533. Urban primary school children under 14 years accounted for 45%(14). Study participants‟ adolescents of age between 12 to 15 years and their parents from selected primary schools (EDHS, 2016) of Hawassa town were included in the study.

4.2. Source population

All primary school children and their parents in the public and private primary schools of Hawassa town

4.3. Study population

Selected primary school children and their parents in Hawassa town in academic year, 2017

4.4. Study subjects

Cases (BMI–for–age above +2SD) or controls (BMI–for–age between -2SD and +1SD), based on the WHO 2007 age- and sex-specific growth standards (58)

4.5. Inclusion and Exclusion criteria

Inclusion criterion: Parents-child pairs who has permanent residence in the study area and having apparently healthy primary school adolescents from age 12-15 years old was included.

Exclusion criterion: A child with evidence of physical impairment (such as physical defects or a grossly deformed), mental impairment and edematous conditions, with any type of chronic illness in the past one year prior to this study and those coming daily from rural areas (outside the town) to attend their school were excluded from the study.

4.6. Sample Size Determination

Sample size was calculated using Epi-Info version-7 statistical software by considering two population proportion with an assumption of 95% confidence level, power of 80%, 5% level of significance (two-sided) and proportion of exposure to an important factors to be studied (BMI of mother or SES of parents) among controls of 32% and among cases 48.5% (57). To increase the precision by reducing the sampling error an additional 5% was also added for non-response and with control to cases ratio of 2:1 was used to determine the minimum sample size. Accordingly 300 participants, assumed logistically possible and reasonably large enough, based on exposure variables to detect at least 2.2 odds ratio differences between cases and controls were determined (57).

4.7. Sampling Technique

Random sampling method was adopted to select the study participants; the total 112 primary schools were first stratified in to two strata by ownership as public 41 schools, and private 71 schools. From public 15 and from private 32 schools which included 5- 8 grade level students were selected as eligible for the study. From the 15 eligible public schools five schools were selected again by using simple random sampling techniques. Also from 32 eligible private schools ten primary schools were selected again by using simple random sampling techniques.
Finally, 15 primary schools from two strata were used for the purpose of this study. Then all sections of 5 to 8 grade levels in each selected school were used. Eligible study subjects were randomly selected from 5^{th} to 8^{th} grades by the school principal and teachers at each school as initial selection. All randomly selected (1407) students on initial selection were assessed by research assistants and PI used standard procedures of anthropometry for their weight status (BMI) and classified as cases (BMI–for–age above +2SD) or controls (BMI–for–age between -2SD and +1SD), based on the WHO 2007 age- and sex-specific growth standards (58), for final study subject. Any participant falling into the underweight (BMI–for–age below -2SD) and overweight category (BMI–for–age between +1SD and +2SD) according to growth chart was excluded from the study. BMI classification was used for further analysis, as this method is the most popular and has been increasingly accepted indirect measure of adiposity in children and adolescents for survey purposes.

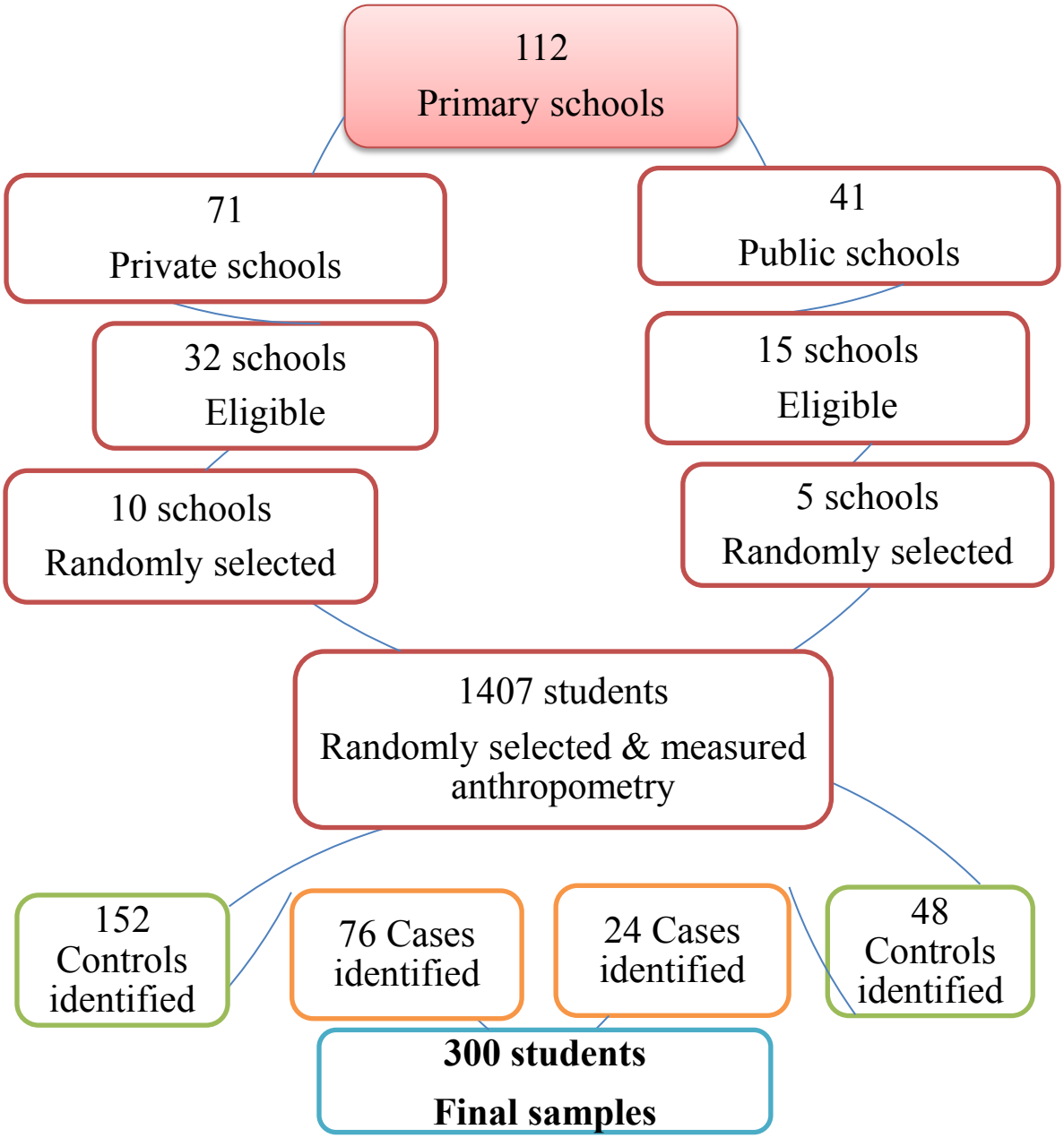

***Figure1*:- Schematic presentation of the sampling procedures and techniques in Hawassa primary school students, June 2017.**

4.8. Data collection procedure

The instrument used for this study was developed based on a published instrument and literature reviews. An interviewer administered questionnaire, adopted from different previous studies and previously validated child feeding practice questionnaire (CFPQ), Birch et al. (2001) (59) with some modifications, were developed in English and then translated in to Amharic and review made for consistency of translation of the language. Pretest and demonstration of instrument was performed on 5% of the sample, from nearby primary school which was not included in the actual study. Three females and three males with BSc in public health and two supervisors qualified with masters of public health were recruited to collect data and supervise the data collection process. Parents‟ socio-demographic characteristics, child feeding attitudes and practices, family home environment characteristics and role modeling behaviour were obtained from the parents during the interview.

Anthropometry Measurements

Body weight and height of the child and their parents were measured within the school premises and at home, in an isolated area was and have not affected the daily routine activity of the school and secured the privacy of the participants, by trained nurse data collectors using calibrated bath room weight scale and according to WHO guidelines (58), in which subjects were asked to remove shoes and empty their pockets, before body weight measurement using calibrated bath room weight scale placed on an even concrete floor accurate to the nearest 0.1 kg. Height was measured to the nearest 0.1 cm with an upright plastic portable stadiometer. The study participants stood upright on bare feet, with heels together, and buttocks and back touching the stadiometer ruler. BMI was calculated as weight in kilograms divided by height squared in meters (kg/m^2). BMI classification was used for further analysis, as this method is the most popular and has been increasingly accepted indirect measure of adiposity in children and adolescents for survey purposes. Anthropometric indicators are easy, simple and affordable tools that can be used for screening obesity and the risk of chronic non-communicable diseases in school children (15).

Parents' child feeding attitude and practices

Child feeding attitudes and practices of the parents was assessed through interviewing the parents about their perceived responsibility of feeding child when their child is at home was assessed by three Likert scale items with the five points frequency responses ranged from 1=never to 5=always. Parents were also asked to rate their child"s current weight status by single item with the five points responses; 1=markedly underweight, 2= underweight, 3=normal weight, 4=overweight and 5=markedly overweight. The extent of parental concern about their children become overweight was assessed by two Likert scale items with 5-points response options i.e. 1=unconcerned, 2=a little concerned, 3=neutral, 4=fairly concerned, 5=very concerned. Whether the parents are monitoring their child"s healthy and unhealthy food intake and activity level or not were assessed by six different Likert scale items of 5-points frequency measuring responses 1=never to 5=always. For the analysis purpose mean score/composite mean were calculated and categorized as below or above means score.

Family home environment factors

Family home environment factors were assessed to determine whether the family environment is positive (i.e. protective of child obesity development) or negative (i.e. obesogenic environment). Parents reported resources availability frequency per week such as, food environment that parents created at home, specifically availability of fruits, vegetables, soft-drinks, sweets and fried (fat) foods at home and frequency of family meals (eating together) per week was also assessed. Means score was calculated and used as cutoff point to categorize above and below means score value.

To assess physical activity related family environment, home availability of physical activity resources (six items with binary responses 1=yes, 2=no) and for media resources availability (five items with binary responses 1=yes, 2=no) were used. The mean was 3 items for physical activity resources and 3 items for media resources; used as cutoff point to categorize above and below means value. Number of TV in the home was assessed by one item with four responses; (1=no TV, 2=one TV, 3=two TV & 4= three or more TV) and dichotomized as (1=one or less TV) and (2=two or more TV).

Parental role modeling behaviour

Parental role modeling behaviour of foods intake and physical activity habit were assessed by single item for each, asking parental soft drinks intake, fruits intake and vegetables intake frequency per week at home in front of their child. Mean frequency of intake per week was used as cutoff point and dichotomized as above or below mean score value for each.

Parental role modeling behaviour for physical activity and screen time (time spent in front of TV, video or computer screen) were assessed by asking the parents hours spent on vigorous exercise, moderate exercise and mild exercise activities per week and mean hours per week was calculated to dichotomize above or below mean hours for analysis. Parental encouraging or reinforcement habit frequency per week for their child to participate in physical activity, to take healthy food and to minimize screen time was assessed by one Likert scale-item with 5-point responses; 1=never to 5=always. For analysis the responses were categorized by merging (1=never and rarely), (2=some of the times) and (3=mostly and always). Some items such as, parental concern, media resources availability, soft drink availability, sweets availability and fat foods availability in the home, were reverse coded to calculate the subscale mean score because high score for these items gives negative effects.

Adolescents' dietary habit

Information on meal frequency, patterns of meal skipping, frequency of consumption of fruits, vegetables and fast food consumption patterns were gathered from the children.

Adolescents' physical activity habit

The Global Physical Activity Questionnaire developed by WHO for physical activity surveillance was used to collect information on physical activity participation in three settings (or domains) including activity at work, travel to and from places and recreational activities and sedentary behavior. The activity level of the study participants were evaluated according to the standard WHO total physical activity calculation guide (60).

4.9. Study Variables

4.9.1. Dependent variable

- Children‟s weight status (being obese as case or normal weight as control)

(BMI-for-age z-scores of WHO 2007 reference were used to indicate their weight status)

4.9.2. Independent variables

4.9.2.1. Family related factors

- **Parents' socio economic and demographic background:–**Age, income, education level, occupation, family size, car ownership, gestational DM dx history and BMI,
- **Parents' child feeding attitude and practices:-** Parent‟s perceived child feeding responsibility, parent‟s perceived child‟s weight, parental concern about child‟s weight, monitoring of child‟s dietary intake & activity.
- **Family home environment factors:-** Home availability of healthy or unhealthy foods including soft drinks, family meal frequency, home availability of physical activity resources and media resources and number of televisions in the home
- **Parents' role modeling behaviour: -**Parental soft drink, fruit and vegetable intake habit, parental total moderate to vigorous physical activity, parental television or video use, family‟s child encouraging habit to healthy behaviour.

4.9.2.2. Adolescent related factors

- **Adolescents' demographic background:-** Age, sex, grade level, school type, BMI
- **Adolescents' dietary intake habit:** - Healthy & unhealthy food intake habit
- **Adolescents' activity behaviours:-** Physical activity & sedentary behaviour

4.10. Operational Definitions

Child feeding practices: **-**parental beliefs, attitudes, and strategies used regarding child feeding (59).

Child feeding strategies: **-** Means by which parents attempt to foster or shape children‟s eating behaviors toward nutritionally desirable dietary outcomes, such as encouraging or restricting children to consume a particular food (59).

Perceived feeding responsibility**:** Three Likert scale items (with 5-points frequency responses ranged from; 1=never to 5=always) assess perception of parents‟ responsibility: for feeding their child (1 item), determining the adolescents‟ portion sizes (1 item), and ensuring consumption of the „„right kind of food‟‟ (1 item). For the analysis purpose means score/composite mean were calculated and categorized as below or above means score.

Perceived child‟s current weight status**:** One Likert scale item (with 5-point response options; 1=markedly underweight, 2=underweight, 3=normal weight, 4=overweight and 5=markedly overweight) assesses parental perception of their child‟s current weight status (1 item).

Parental concern about child weight: Three Likert scale items (with 5-points response options; 1=unconcerned, 2=a little concerned, 3=neutral, 4=fairly concerned, 5=very concerned) assess parents‟ concerns about their child‟s weight: eating too much when the parent was not around (1 item), needing to diet to maintain a desirable weight (1 item), and becoming overweight (1 item). For the analysis purpose means score/composite mean were calculated and categorized as below or above means score.

Monitoring*:* Six Likert scale items (of 5-points frequency measuring response options; 1=never to 5=always) assess the extent to which parents oversee their child's intake of fruits (1 item), vegetables (1 item), sweets (1 item), soft drinks (1 item), fried foods (1 item) and activity (1 item). For the analysis means score/composite mean was calculated and categorized as above or below means score.

Family home environment: The home food environment and home activity environment are considered to include events (meals/family meals), objects (household availability of foods and activity equipment) and parental role modeling experienced by children and parents in the family context, based on previous definitions (*Bjelland.et al.)*

Food availability at home: Five items assess food or drinks at the home that may promote or reduce the risk of obesity development (1 item for each). These items focus on fruits, vegetables, soft or sugar-sweetened beverages, sweets, and fried food. Items for unhealthy foods were coded in reverse to indicate a positive family food environment. Mean value (days/week) was calculated and used as cutoff point to dichotomize as: above and below means score value.

***Family meals frequency*:** One item in this domain aim to assess family eating patterns including how often the family eats together at home as family meals per week (1 item). Means score was calculated and used as cutoff point to dichotomize as: above and below means score value.

Home availability of PA resources: Six items with binary responses; (1=yes, 2=no) used. The mean was 3 items as physical activity resources; mean used as cutoff point to dichotomize above and below mean items.

Home availability media resources: Five items with binary responses; (1=yes, 2=no) used. The mean was 3 items for media resources; mean used as cutoff point to dichotomize: above or below mean value.

Number of TV in the home*:* One item with response options; (1=No TV), (2=One TV), (3=Two TV) & (4=Three or more TV) & based on literatures dichotomized as (1=One or less TV) and (2=Two or more TV).

Parental role modeling behaviour: Three items assess food or drinks intake habit of the parents at home in front of their child as role model (1 item for each). These items focus on fruits, vegetables, and soft or sugar-sweetened beverages per week. Items for unhealthy foods role modeling were coded in reverse to indicate a positive family food environment. Mean value (days/week) used as cutoff point and dichotomized as above or below mean score value for each.

Activity role modeling: Three items assess physical activity habit of the parents at home in front of their children as role model (1 item for each). These items focus on hours spent on vigorous exercise, moderate exercise and on mild exercise per week. For analysis mean hours per week was calculated to dichotomize as, above or below mean hours/week (=active or inactive).

Parental encouraging habit: One item (response options; 1=never to 5=always) assesses how often the family encourages their child for healthy behaviour per week. For analysis the responses were categorized by merging (1=never and rarely), (2=some of the times) and (3=mostly and always).

4.11. Data analysis

The data was checked for completeness, coded and entered in to Epi-Info version 7 and then cleaned for statistical analysis using STATA statistical software version 14. Descriptive statistics was derived to determine the distribution of demographic information among case and control groups. The WHO 2007 age- and sex- specific BMI cut-offs developed to classify children overweight and obesity was used for the children in this study (Annexed). The normal weight group included those between the underweight and the overweight as classified by the recommended criteria for children(10, 61). BMI cutoffs for adults was used to classify overweight and obesity for parents: „overweight" is defined as BMI ≥ 28 kg/m^2, and „obesity" BMI ≥ 30 kg/m^2, while the underweight cut off of BMI for adults was 18.5 kg/m^2 based on the recommendation from WHO, 2007(WHO, 2007). Response rates, means and standard deviations were calculated for individual items in the survey. The composite/mean scores were calculated for each subscale by using formula; $\check{X}\ \frac{wx}{w}$. Higher scores indicated greater parental concern, about the child"s weight, greater parental control over the child eating, and a more positive food environment at home. Some items in subscales of food availability and family eating patterns were reverse-coded, so that higher scores consistently reflected more positive family food environment. Bivariate analysis was done to compare child obesity with each independent variable. The Odds ratio (OR) and its 95% confidence interval (CI) were computed for each categorical factor which shows significant effect on the response using binary logistic regression. The stepwise regression model was used to test the determinant predictor of adolescent obesity. To evaluate the association between a single independent variable with dependent variable crude odds ratio was used and those variable that had p-value less than 0.25 were included in the multivariable analysis. Multivariate logistic regression analyses were used to identify which familial factor is the strongest predictors of children"s weight (BMI for-age z-scores). A factor with an OR significantly ($p < 0.05$) higher than 1.00 was taken as a risk factor of obesity, while OR significantly ($p < 0.05$) less than 1.00 was regarded as a protective factor. The adjusted odds ratio was used to determine the strength of association and corresponding 95% CI was used to decide statistically significant association between the explanatory variable and outcome variable.

4.12. Data Quality Management

To maintain quality of data, pre-tested and structured questionnaires were used for data collection, two days training was given to data collectors on the objective of the study, measurement procedures and ethical issues prior to the pre-test and additional one day training was given with the final version of the questionnaire before the actual data collection. Also supervision of data collection processes was held and 5 % of the questionnaires were rechecked every day. The collected data was checked for completeness and consistencies by the supervisors and the principal investigator. The scales were regularly checked and adjusted to zero after each measurement. Meanwhile, the collected data was entered into Epi Info version 7 prepared templates by the data clerk. 10% of the data sets were double entered, and missing values and outliers were checked using statistical software for the accuracy of the data.

4.13. Ethical Considerations

Ethical clearance and official letter for this study was obtained from the ethical review board of Addis Ababa University. Permission was obtained from Hawassa city administration education office. After getting permission from the schools to participate in the study, assent was obtained from children‟s family for those participants and verbal consent was obtained for willingness from children. The students‟ privacy during the interview and anthropometric measurement was maintained by conducting in a private place with interviewer of the same sex. They were informed that there is no incentives and harm for their participation in this study and also the data obtained from them were kept confidential by not writing participant`s name in the questionnaire and during interview. Obese children and their parents were advised on lifestyle change and to attend the nearby health facility to checkup for any of obesity related problems.

4.14. Dissemination of the results

The final result of this research will be presented to the community of SPH AAU and will be submitted to Addis Ababa University, School of Public Health, to the school library and will disseminated to participated primary schools of Hawassa town and city administration. Finally, it will be proposed to produce a publication in reputable journals on the main outcome from the study, Familial Correlates of Adolescence Obesity among Primary School Adolescents in Hawassa Town, Southern Ethiopia.

5. Results

In general, three hundred pairs of primary school children and their parents were involved in this study (response rate 100% for students and 98% for parents).

5.1. Socio economic and demographic characteristics

Socio demographic characteristics of the respondents were shown on table: 1 and 2. In general, 100 cases and 200 controls and their parents, between age 12 – 15 years with mean age 13.35 (1.07) and males accounted 129(43%) were participated. Among them, 228(76.0%) (Cases =25% and controls =51%) were from private schools and 105(46.05%) of them were males. Two hundred control groups were included from the same sex, grade level, sections and with the age nearest to $\pm$ 2 years difference from the schools where their counterpart cases were identified.

Three hundred parents of the children were interviewed for the information about their socio demography, child feeding practices and family home environment characteristics they have created for their children. Most of the parents interviewed 293(98.3%) were indicated that the mothers were responsible for supplying, purchasing and preparing family meal in both groups. The age range of the mothers was 23 – 52 with mean age 36.6 (SD: 4.5). The age range of the fathers was 27 - 58 with mean age 41.9 (SD: 5.2). According to the parents response data segregated monthly family income (sum of both parents any kind of monthly income) range was 1,200 – 20,000 Birr. The mean monthly family income was 8252.3 (SD. 4129.7) and the median was 8,000 eth birr. In the model, income was re-coded as above/below mean category. The parents highest completed education level for 179 (59.7%) of the mothers and 239 (79.7%) of fathers were more than secondary school education. Based on the parents‟ response, 120 (40%) of mothers and 175 (58.3%) of fathers were government employee by their occupation while 67 (22.3%) of mothers was housewife and 2 (0.7%) of fathers were farmer. The participant household family size ranged from 3 – 10 with mean value 4.9 (SD: 1.4). Overall, 37 (12.3%) of the households owned car as family transport means and 10 (3.3%) of the mothers reported “Yes” for the pregnancy related diabetes mellitus diagnosis history. Objectively measured anthropometric measurement, weight in kg and height in meter, showed that the parent weight ranged from 55kg to 108kg (mean=70.8, SD: 9.7) for mothers whereas 64kg to 101kg (mean=74.5, SD: 7.8) for fathers.

The parents‟ height in meter also ranged from 1.55 – 1.76 meter (mean= 1.62, SD: 0.07) for mothers, and 1.66 – 1.86 meters (mean= 1.69, SD: 0.05) for fathers. Over all, among mothers‟ 1(0.3%) was underweight, 117(39%) normal, 110 (36.67%) overweight and 71 (24%) were obese, whereas among fathers 1(0.3%) was underweight, 115(38.5%) normal, 159(53.2%) overweight and 24(8.0%) were obese.

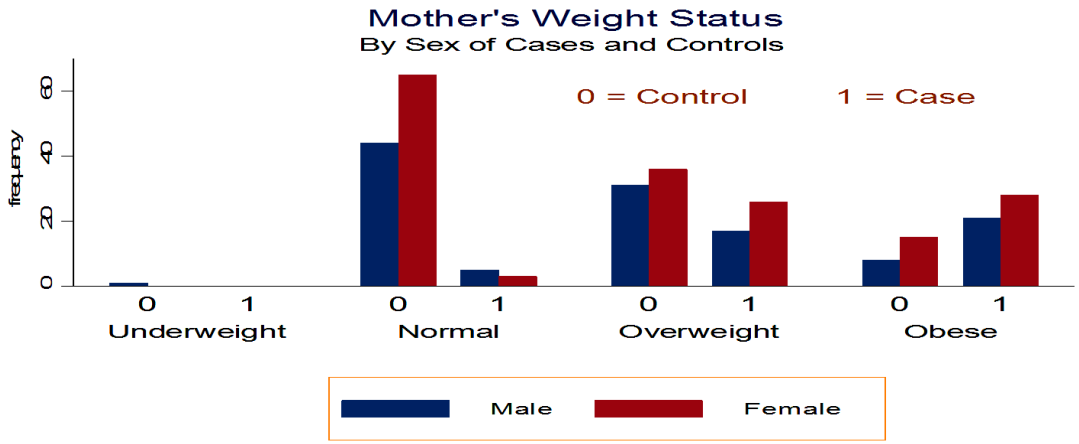

Figure -2: **Parents weight status in relation to child's sex and BMI category.**

Table 1: Socio demographic characteristics of participant primary school children in Hawassa town southern Ethiopia, 2017

Explanatory variables	Total n=300 (%)	Child Weight status		p-value
		Obese n (%)	Normal weight n (%)	
Sex (N, %)				0.869
Male	129 (43.0)	43 (14.3)	86 (28.7)	
Female	171 (57.0)	57 (19.0)	114 (38.0)	
Age (in years) (N, %)				0.630
12	83 (27.7)	32 (10.7)	51 (17.0)	
13	86 (28.7)	26 (8.7)	60 (20.0)	
14	77 (25.7)	26 (8.7)	51(17.0)	
15	54 (18.0)	16 (5.3)	38 (12.7)	
Grade level (N, %)				0.994
5^{th}	42 (14.0)	14 (4.7)	28 (9.3)	
6^{th}	105 (35.0)	35 (11.7)	70 (23.3)	
7^{th}	72 (24.0)	24 (8.0)	48 (16.0)	
8^{th}	81 (27.0)	27 (9.0)	54 (18.0)	
School type (N, %)				1.00
Public	72 (24.0)	24 (8.0)	48 (16.0)	
Private	228 (76.0)	76 (25.0)	152 (51.0)	

**** P-value for X^2 test;***

Table 2: Results of the distribution of each variables relating to parent's socio demographic characteristics among obese and normal weight primary school adolescents, Hawassa town, southern Ethiopia, 2017

Exposure variables	Total n=300 (%)	Child Weight status		P-value
		Obese (N=100)	Non obese (N=200)	
Mother's age (*Mean, SD*)	**36.6 (4.5)**	**37.24(4.11)**	**36.23(4.66)**	0.111
< 30	35	6 (2)	29 (9.7)	
30 - 39	189(63.0)	66 (22)	123 (41)	
40 - 49	74	28(9.3)	46 (15.3)	
> 49	2	0(0.0)	2 (0.7)	
Father's age (*Mean, SD)*	**41.9 (5.2)**	**42.77(5.5)**	**41.54(4.96)**	<0.008
< 30	2	0 (0.0)	2 (0.7)	
30 - 39	87	23 (7.7)	64 (21.3)	
40 - 49	189(63.0)	63 (21)	126 (42)	
> 49	22	14 (4.7)	8 (2.7)	
Mother's education (N, %)				0.118
No formal education	4	0(0)	4(1.3)	
Primary education	32	7(2.3)	25(8.3)	
Secondary education	107(35.7)	33(11.0)	74(24.7)	
Higher education	157(52.3)	60(20.0)	97(32.3)	
Father's education (N, %)				0.158
No formal education	2	1(0.3)	1(0.3)	
Primary education	8	0(0.0)	8 (2.7)	
Secondary education	67(22.3)	26(8.7)	41(13.7)	
Higher education	223(74.3)	73(24.3)	150 (50)	
Mother's occupation (N, %)				< 0.011
Housewife	67(22.3)	14 (4.7)	53(17.7)	
Employed	120(40.0)	45 (15.0)	75(25.0)	
Private business	105	41(13.7)	64(21.3)	
Others	8	0(0.0)	8(2.7)	
Father's occupation (N, %)				0.289
Jobless	1(0.3)	0(0.0)	1(0.3)	
Employed	175(58.3)	53(17.7)	122(40.7)	
Private business	102	41(13,7)	61(20.3)	
Others	22	6(2.0)	16(5.3)	
Mother's BMI (*Mean, SD*)	**26.8 (4.37)**	**29.92**	**25.27**	<0.000
Normal	117	8 (2.7)	109 (36.3)	
Overweight	110	43 (14.3)	67 (22.3)	
Obese	72	49 (16.3)	23 (7.7)	
Father's BMI (*Mean, SD*)	**25.92 (2.8)**	**27.16**	**25.31**	<0.000
Normal	115	19 (6.4)	96 (32.1)	
Overweight	159	67 (22.4)	92 (30.8)	
Obese	24	13 (4.4)	11 (3.7)	

Table 2:- ……Continued…..

Monthly Income(*Mean*)				< 0.000
< 8,000 eth. birr	175	34 (11.3)	141 (47.0)	
≥ 8,000 eth. birr	125	66 (22.0)	59 (19.7)	
Family Size (*Mean, SD*)	**4.9 (1.4)**	**5.2 (1.4)**	**4.8 (1.4)**	< 0.002
< 5	201	58 (19.3)	143 (47.7)	
≥ 5	99	42 (14.0)	57 (19.0)	
GDM Diagnosis Hx. (N, %)				0.069
Yes	10	6 (2.0)	4 (1.3)	
No	290	94 (31.3)	196 (65.3)	
Car Ownership (N, %)				< 0.004
Yes	37	20 (6.7)	17 (5.7)	
No	263	80 (26.7)	183 (61.0)	

**** P-value for X^2 test; **** *GDM= gestational diabetes mellitus history, SD= standared deviation*

Regarding the adolescents‟ characteristics, there was a significant difference in the BMI kg/m^2 between the cases and controls, where the controls were having a lower BMI compared to the cases. There was no significant difference in the adolescents‟ age and grade level between the cases and control.

Parents of the obese and control groups showed significant differences in terms of fathers age (P>0.05). However, no significant difference in the level of education were observed between the parents of case and control; there were a significant different in mothers‟ occupation between case and control group (p=<0.035), but there was no significant difference in fathers occupation (p=0.285). Mean body mass index (BMI) category for mothers‟ in the cases group was 29.9 (SD=3.5) and for fathers is 27.2 (SD=2.4) and for their counterpart controls were (Mean =25.3, SD: 3.9) and 25.3 (SD: 2.8), respectively. There were significantly higher rates of overweight and obesity among parents of cases than controls, higher body mass index (BMI) were observed in mothers of obese group. Particularly, for parents in the obese group significantly higher level of mean monthly household income (M=9898, SD: 3994.8) than controls (M=7399, SD: 3841) (p<0.001). Prevalence of car ownership in household and pregnancy related diabetes mellitus diagnosis history shows significant difference among parents, higher in the parents of obese children than in controls (p<0.004). An obese group has on average significantly higher family size (M=5.2, SD: 1.4) compared to non-obese control groups (M=4.8, SD: 1.4) (P< 0.01).

5.2. Familial correlates of adolescent obesity

5.2.1. Parents' child feeding attitude and practices

The parents‟ responses frequency, means (SD), mean score and subscale summary results on child feeding attitudes and practices are presented in tables 3a to 3d.

Five percent of parents answered never, 29.3% rarely and 22% responded as they perceived that they are sometimes responsible for preparing their child‟s meal while 44% of the respondents indicated that they were responsible for preparing their child‟s meal most of the time and always. 41% of the respondents indicated that they were responsible most of the time or always for making decisions regarding the right foods for their child, while 35.3% of parents never or rarely and 23.7% indicated that they were responsible to make decisions. However, more than half (51.6% of) the respondents never or rarely responsible to determined their child‟s portion size but only 28.7% of the respondents indicated that they determined their child‟s portion size most of the time or always. Parental responsibility level for child feeding, for deciding child‟s portion size, deciding right kind foods were significantly lower in parents‟ of obese (mean score = 2.56) than those of healthy controls (mean score = 3.20).

Table 3a: Parents' response on their perceived responsibility of child feeding (N=300)

Items	Childs weight status	Parents‟ Response n (%)						
		1	2	3	4	5	M	SD
When your child is at home, how often are you responsible for preparing his/her meals?	Obese	4 (1.3)	49 (16.3)	14 (4.7)	21 (7.0)	12 (4.0)	2.88	0.12
	Normal	11 (3.7)	39 (13.0)	52 (17.3)	50 (16.7)	48 (16.0)	3.43	0.09
How often are you responsible for deciding what your child's portion sizes?	Obese	30 (10.0)	36 (12.0)	14 (4.7)	9 (3.0)	11 (3.7)	2.35	0.13
	Normal	43 (14.3)	46 (15.3)	45 (15.0)	42 (14.0)	24 (8.0)	2.79	0.09
How often you are responsible for deciding your child's has eaten the right kind of foods?	Obese	16 (5.0)	45 (15.0)	21 (7.0)	14 (4.7)	4 (1.3)	2.45	0.10
	Normal	7 (2.0)	40 (13.3)	49 (16.3)	75 (25.0)	29 (9.7)	3.39	0.08
Mean score for Cases group = 2.56 < for Controls group = 3.20 **Subscale summary** = 2.99								

Response option: 1=never, 2=rarely, 3=half of the time, 4=most of the time, 5=always

Parents were asked to rate their child"s current weight status and the results are presented in Table 3b. However, based on their objectively measured BMI data the actual proportion of normal weight 200(67%) and obese children was 100(33%); the parents thought their child was markedly underweight, underweight or overweight. Overall, 141(47% of) the parent"s (135 (45%) of controls and 6(2%) of cases were) classified their child"s weight status correctly whereas 159 (53% of) the parents (65 (21.7%) of controls and 94(31.3%) of cases) were classified their child"s current weight status incorrectly. Among 159 (53% of) incorrectly classified parents 41(13.7%) were overestimated (all were parents of controls) whereas 118(39.3% of) the parents (24 (8% of) controls and 94 (31.3% of) cases) were underestimated their child"s weight status. The majority (39.3%) of the parents underestimated their child"s weight status were in the parents of the cases. Parents" perceptions of their children as obese were very close in both case and control groups, 6(2%) vs. 5(1.7%) respectively. Overall, parents" perception of children"s weight had a significant association with children"s actual BMI. To simplify the representation of the correspondence between parents" perceptions and children"s actual weight status, „markedly underweight" and „underweight" were combined, as „underweight" and „markedly overweight" was combined with „obese".

Table 3b: Comparison between correct and incorrect classification of child's body weight by their parents in relation to actual weight status

Child actual weight status	Parental perception of their child"s weight n = 300		χ2 test	
	Correct n (%)	Incorrect n (%)	χ2 value	p-value
Obese (n=100)	6 (2.0)	94 (31.3)	101.22	0.0000
Normal weight (n=200)	135 (45.0)	65 (21.7)		
Total (n=300)	141 (47.0)	159 (53.0)		

Table: 3b1 Parents Perceived Child Weight status and Child"s Actual Weight Status (***N=300***)*

Item		Objectively measured Child"s actual BMI category based on WHO 2007 reference			
		Underweight n=0	Normal ***n=200***	Overweight n=0	Obese ***n=100***
Parents' Perceived child's current weight status	Parents" of Obese	5 (1.7%)	33 (11.0%)	56 (18.7%)	6 (2.0%)
	Parents" of Normal wt.	24 (8.0%)	135 (45.0%)	36 (12.0%)	5 (1.7%)
Total	***300***	***29 (9.7%)***	***168 (56.0%)***	***92 (30.7%)***	***11(3.7%)***

**** Results based on responses to "parents perceived child weight status"; responses of „underweight" and „markedly underweight" were combined into „Underweight", and responses of „markedly overweight" were categorized as „Obese".***

The response to parental concern about child‟s eating and weight is shown in table: 3c. About 95(31.7%) respondents indicated that they were concerned, 25(8.3%) fairly concerned and 17(5.7%) were very concerned about their child eating too much when the parent wasn‟t there, while 91(30.3%) unconcerned and 72(24%) shown a little concern. Only 56(18.7%) of the parents said that they are unconcerned and 76(25.3%) a little concerned about their child‟s having to diet to maintain a desirable weight or becoming overweight while a considerable proportion 111(37%) of respondents indicated that they were concerned, 28(9.3%) fairly concerned and 29(9.7%) very concerned about their child having to diet to maintain a desirable weight or becoming overweight.

Table 3c: Parents' extent of concern regarding their child's weight status (N=300)

Items	Childs weight status	Parents‟ Response n (%)						
		1	2	3	4	5		
How concerned are you about your child eating too much when you are not around him/her?	Obese	26 (8.7)	25 (8.3)	33 (11.0)	13 (4.3)	3 (1.0)		
	Normal	65 (21.7)	47 (15.7)	62 (20.7)	12 (4.0)	14 (4.7)		
How concerned are you about your child having to diet to maintain a desirable weight or becoming overweight?	Obese	16 (5.3)	21 (7.0)	38 (12.7)	16 (5.3)	9 (3.0)		
	Normal	40 (13.3)	55 (18.3)	73 (24.3)	12 (4.0)	20 (6.7)		
Mean score of Cases group =2.62 > Mean score of Control group = 2.45 Subscale summary = 2.51								

**** Response option:*** *1=unconcerned, 2=a little concerned, 3=concerned, 4=fairly concerned, 5=very concerned.*

Respondents indicated that they did keep track of their child‟s intake of energy-dense foods to some extent. The percentages of those who indicated they paid attention most of the time or always on their child‟s intake of sweet foods was (28.3%), fats or fried foods (26.7%), soft drinks (17.7%), fruits and vegetables (27%), TV or video (39%) and exercise were (13.3%). Parental monitoring level on keeping track of intake for unhealthy and healthy foods, screen time and physical activity were significantly lower in parents‟ of obese (mean score=2.15) than those of healthy controls (mean score =2.90). The parents‟ responses; frequency, mean (SD), mean score and subscale summary results on Parental monitoring level on keeping track off are shown below in table: 3d.

Table 3d: Parents' response on the extent of monitoring their child's dietary intake (N=300)

Items	Childs weight Status	Parents" Response n (%)						
		1	2	3	4	5	M	SD
How much do you keep track of the sweets that your child eats?	Obese	22 (7.3)	51 (17)	18 (6.0)	5 (1.7)	4 (1.3)	2.18	1.0
	Normal	29 (9.7)	59 (19.7)	36 (12.0)	43 (14.3)	33 (11.0)	2.96	1.3
How much do you keep track of fried foods (fried meat, fried vegetables, etc.) that your child eats?	Obese	28 (9.3)	45 (15.0)	19 (6.3)	6 (2.0)	2 (0.7)	2.09	0.9
	Normal	19 (6.3)	61 (20.3)	48 (16.0)	48 (16.0)	24 (8.0)	2.99	1.2
How much do you keep track of soft drinks that your child drinks?	Obese	33 (11.0)	45 (15.0)	14 (4.7)	7 (2.3)	1 (0.3)	1.98	0.9
	Normal	28 (9.3)	77 (25.7)	50 (16.7)	26 (8.7)	19 (6.3)	2.66	1.2
How much do you keep track of servings of fruits and vegetables your child is eating?	Obese	13 (4.3)	51 (17.0)	27 (9.0)	6 (2.0)	3 (1.0)	2.35	0.9
	Normal	14 (4.7)	49 (16.3)	65 (21.7)	47 (15.7)	25 (8.3)	3.10	1.1
How much do you keep track of the amount of TV or videos your child is watching?	Obese	14 (4.7)	36 (12.0)	32 (10.7)	16 (5.3)	2 (0.7)	2.56	1.0
	Normal	13 (4.3)	42 (14.0)	46 (15.3)	50 (16.7)	49 (16.3)	3.40	1.2
How much do you keep track of the exercise your child is getting?	Obese	54 (18.0)	33 (11.0)	5 (1.7)	1 (0.3)	7 (2.3)	1.74	1.1
	Normal	60 (20.0)	72 (24.0)	36 (12.0)	14 (4.7)	18 (6.0)	2.29	1.2
Mean score for Cases group=2.15 < for Controls group = 2.90 Subscale summary =2.65								

***Response option:** 1=never, 2=rarely, 3=half of the time, 4=most of the time, 5=always*

5.2.2. Family home environment factors

Table 4 shows responses to frequencies of certain foods and drinks available at home and eating patterns. About, 112 (37.3%) of respondents indicated that they had fruits available at home 2 days or more per week and 170 (57%) of respondents indicated that they had vegetables available at home 4 days or more per week. More than half 167 (56%) of respondents indicated that sweets were available at home 2 days or more per week and 145(48.3%) indicated that fried foods were available at home 3 days or more per week. Large proportion, 241(80.3%) of families had soft drinks available at home 2 days or more per week. Fried foods were more available at home as compared with sweets and soft drinks. Regarding home food availability, parents of cases group reported a greater mean home availability of fats, sweets and soft drinks than the controls group.

Family eating patterns (dinner as a family meal) results shown that more than fifty percent (40% of controls and 10% of cases) parents indicated that their families ate dinner together 5 days or more per week. The obese children had significantly lower family meals frequency than their counterparts.

The use of bicycle, gym and sport equipment was more prevalent in controls. The overall availability of sedentary pursuit or media resources in the family of obese groups was greater than controls. Although the majority 286 (95.3%) of the studied population did not own play stations, 11(3.7%) parents‟ of cases group reported greater exposure to household and neighbor play station games than the control groups 3(1.0%) subjects. Number of TV in the home was categorized as ($\leq$ 1) and ($\geq$ 2) and overall, 103(34.3%) of parents (23% of cases and 11.3% of controls) reported availability of two or more number of TV in their home.

5.2.3. Parental role modeling behaviour

The result of parental role modeling behaviour of dietary intake and physical activity habit assessment response is shown in table 5.

Mean frequency of intake per week was 2 times (SD=1.14) for fruits and 3times (SD=1.17) times per week for vegetables. Nearly, sixty percent of parents take fruits less than 2 times per week and vegetables less than 3 times per week. Most of parents (76%) take soft drinks at least 2 times per week in front of their child and somewhere else. Regarding diet habits, parents of cases groups reported a greater mean consumption of fats, sweets and soft drinks than the controls. They also ate significantly less fruits, vegetables and demonstrating lower role modeling healthy behaviour for their children than their counterpart controls.

Regarding the physical activity levels of the parents specifically, for the obese children, 81% of their parents were categorized as not physically active, in comparison to 62% of the parents of normal-weight children. Differences regarding the categorization of the parents according to their physical activity levels and the obesity in their children were observed (X^2=11.12; P=0.001). Parents‟ of the obese group were significantly less engaged in regular physical activity than the controls, with higher TV or video watching habit on both week days and weekend days.

About, 44.3% of parents (21.7% of cases and 22.7% of controls) never or rarely encouraged their child for healthy behaviour, while only 31.6% of parents (5.3% of cases and 26.3% of controls) encouraged their children most of times or always for healthy behaviour. The obese children had significantly lower parental encouragement (i.e. positive reinforcement for healthy behaviour) frequency than the control groups.

Unadjusted logistic regression models were used to evaluate the effect of selected familial factors on the likelihood of child obesity. As can be noted from the result of the bivariate analyses (Tables 4, 5 and 6), some of the variables did not show significant association with child obesity at a 5% level of significance. In this regard, fathers‟ occupation, parental concern, child sex, age, grade level and type of school were not significantly (p=0.25) associated with obesity excluded from further analyses. In fact, the corresponding P-values for each of these variables were greater than 0.25 levels. Any predictor variable which fulfilled the minimum requirement for further assessment were considered and variables like mother age, father BMI, father occupation, mother occupation, were removed due to their redundancy and multicolinearity. Predictor variables with a P-value of smaller than 0.25 and other variables of known clinical relevance were included (even if they are statistically insignificant, i.e. mother‟s education level) into the multivariable logistic regression model (8, 9). Consequently, the multivariable logistic regression analysis which controls the adverse effects of confounding variables was used by taking all the significant covariates (determinants of childhood obesity) into account, simultaneously. The backward stepwise regression which controls the problem of multicolinearity was employed and only ten most contributing factors remained to be significantly and independently associated with childhood obesity. The same findings were also obtained using the forward stepwise regression.

Table 4: Results from logistic regression analysis to evaluate the association of socio economic and demographic characteristics of parents with adolescence obesity among obese and normal weight primary school children, Hawassa town, southern Ethiopia, 2017

Exposure variables	Child Weight status		Bivariate analyses Crud OR with 95% CI			p-value
	Obese (N=100)	Normal (N=200)	COR	Lower	Upper	
Mother's age (*years*) (N, %)						0.064*
< 30 *R**	6 (2)	29 (9.7)	1			
30 - 39	66 (22)	123 (41)	2.59	1.02	6.56	
40 - 49	28 (9.3)	46 (15.3)	2.94	1.09	7.97	
> 49	0 (0.0)	2 (0.7)				
Father's age (*years*) N,%						0.005*
< 30 *R**	0 (0.0)	2 (0.7)	1			
30 - 39	23 (7.7)	64 (21.3)	0.21	0.08	0.55	
40 - 49	63 (21)	126 (42)	0.29	0.11	0.72	
> 49	14 (4.7)	8 (2.7)				
Mother's education (N, %)						0.138*
No formal education *R**	0(0)	4(1.3)	1			
Primary education	7(2.3)	25(8.3)	0.45	0.18	1.11	
Secondary education	33(11)	74(24.7)	0.72	0.43	1.21	
Higher education	60(20)	97(32.3)				
Father's education (N, %)						0.593
No formal education *R**	1(0.3)	1(0.3)	1			
Primary education	0(0.0)	8 (2.7)				
Secondary education	26(8.7)	41(13.7)	0.63	0.04	10.58	
Higher education	73(24.3)	150 (50)	0.49	0.03	7.89	
Mother's occupation (N, %)						0.025*
Housewife *R**	14 (4.7)	53(17.7)	1			
Employed	45 (15.0)	75(25.0)	2.27	1.13	4.55	
Private business	41(13.7)	64(21.3)	2.43	1.20	4.92	
Others	0(0.0)	8(2.7)				
Father's occupation (N, %)						0.200*
Jobless *R**	0(0.0)	1(0.3)	1			
Employed	53(17.7)	122(40.7)	1.16	0.43	3.12	
Private business	41(13,7)	61(20.3)	1.79	0.65	4.96	
Others	6(2.0)	16(5.3)				
Mother's BMI (N, %)						0.000*
Normal *R**	8 (2.7)	109 (36.3)	1			
Overweight	43 (14.3)	67 (22.3)	8.74	3.88	19.73	
Obese	49 (16.3)	23 (7.7)	29.03	12.13	69.44	
Father's BMI (N, %)						0.000*
Normal *R**	19 (6.4)	96 (32.1)	1			
Overweight	67 (22.4)	92 (30.8)	3.68	2.05	6.60	
Obese	13 (4.4)	11 (3.7)	5.97	2.33	15.31	

Table 4 :- (Continued….)						
Monthly Income (Median)						0.000*
< 8,000 [R*]	34 (11.3)	141 (47.0)	1			
≥ 8,000	66 (22.0)	59 (19.7)	4.64	2.78	7.75	
Family Size *(N, %)*						0.020*
≤ 5 [R*]	58 (19.3)	143 (47.7)	1			
> 5	42 (14.0)	57 (19.0)	1.82	1.10	3.00	
GDM Diagnosis Hx. *(N, %)*						0.079*
Yes	6 (2)	4 (1.3)	3.13	0.86	11.35	
No [R*]	94 (31.3)	196 (65.3)	1			
Car Ownership *(N, %)*						0.005*
Yes	20 (6.7)	17 (5.7)	2.69	1.34	5.41	
No [R*]	80 (26.7)	183 (61.0)	1			

**** Significant at p < 0.25 level of significance selected into the multivariable logistic regression***
**** R = reference, GDM = Gestational diabetes mellitus, Hx = history***

Table 5: Results from logistic regression analysis to evaluate the association of each explanatory variable relating to parents' child feeding attitude & practices, with adolescence obesity among obese and normal weight primary school children, Hawassa town, southern Ethiopia, 2017 (Bivariate analyses)

Explanatory variable	Child Weight status		Bivariate analysis		
	Obese (N=100)	Non obese (N=200)	COR	95% CI	p-value
Perceived responsibility (*M. score*)					0.002*
Below	74	112	2.24	1.28 – 3.95	
Above/High R*	26	88	1		
Perceived child's weight (*N, %*)					0.000*
Underweight R*	5	24	1		
Normal	33	135	1.17	0.42 – 3.31	
Overweight	56	36	7.47*	2.61 – 21.35	
Obese	6	5	5.76*	1.25 – 26.57	
Parental concern (*M. score*)					0.122*
Below R*	79	172	1		
Above/High	21	28	1.63	0.83 – 3.19	
Parental monitoring (*M. score*)					0.000*
Below	79	85	5.09	2.92 – 8.88	
Above/High R*	21	115	1		
Soft drinks intake habit (*Mean*)					0.000*
< 2 times/week R*	58	170	1		
≥ 2 times/week	42	30	4.10*	2.36 -7.15	
Fruits intake habit (*Mean*)					0.002*
< 2 times/ week	73	109	2.26*	1.34 - 3.80	
≥ 2 times/ week R*	27	91	1		
Vegetables intake habit (*Mean*)					0.010*
< 3 times/ week	70	109	2.00*	1.17 - 3.24	
≥ 3 times/ week R*	30	91	1		
Sport activity habit (*Mean*)					0.000*
Inactive	81	124	2.62*	1.47 – 4.65	
Active R*	19	76	1		
Parents' child encouraging habit					0.000*
Never or Rarely	65	68	4.72*	2.50 - 8.91	
Sometimes	19	53	1.77	0.84 - 3.75	
Mostly or Always R*	16	79	1		

**** Significant at p < 0.25 level of significance selected into the multivariable logistic regression***
**** R = reference***

Table 6: Results from logistic regression analysis to evaluate the association of each explanatory variable relating to family home food and physical activity environment, with adolescence obesity among obese and normal weight primary school children, Hawassa town, southern Ethiopia, 2017 (Bivariate analyses)

Explanatory variables	Child Weight status		Bivariate analysis		
	Obese (N=100)	Non obese (N=200)	COR	95% CI	p-value
Home fruit availability					**0.273**
< 2 times/wk.	67	121	1.33	0.80 – 2.19	
≥ 2 times/wk. *R**	33	79	1		
Home vegetable availability					**0.000***
< 4 times/wk.	59	71	2.61*	1.55 – 4.41	
≥ 4 times/wk. *R**	41	129	1		
Home soft drink availability					**0.000***
< 2 times/wk. *R**	55	163	1		
≥ 2 times/wk.	45	37	3.60*	2.12 – 6.13	
Home sweets availability					**0.000***
< 2 times/wk. *R**	25	180	1		
≥ 2 times/wk.	75	20	3.00*	1.57 – 5.73	
Home fat foods availability					**0.002***
< 3 times/wk. *R**	39	116	1		
≥ 3 times/wk.	61	84	2.16*	1.29 – 3.53	
Family meal frequency					**0.000***
< 5 times/wk.	69	81	3.27*	1.97 - 5.44	
≥ 5 times/wk. *R**	31	119	1		
Home Activity resources (M)					**0.022***
Above mean *R**	9	39	1		
Below mean	91	161	2.45*	1.14 – 5.28	
Home Media resources (M)					**0.000***
Above mean	40	40	2.67*	1.57- 4.53	
Below mean *R**	60	160	1		
Number of TV in the home					**0.000***
≤ One *R**	31	166	1		
≥ Two	69	34	10.87*	6.19 - 19.06	

***Significant at p < 0.25 level of significance selected into the multivariable logistic regression,*
R = reference

Upon completion of the bivariate analysis, variables which had significant associations with outcome variables were selected for the multivariable analysis. Any variable whose bivariate test has a p-value ≤ 0.25 was a candidate for multivariable model along with all variables of known clinical importance. The screening criterion used for variable selection, that was p-value ≤ 0.25 level, were based on the recommendation of work on logistic regression that showed the use of more traditional level (such as 0.05) often fail to identify variables known to be important. (Zoran B. and David H. 2007)

Based on aforementioned criteria almost all variables included in bivariate analysis were statistically significant ($p<0.25$) and eligible for multivariate logistic analysis, except the fathers‟ occupation and home availability of fruits. Once the variables have been identified, we begin with a model containing all of the selected variables.

The majority of the variables which showed significant associations with child obesity in the bivariate analyses could not persist in having such associations in the multivariable analyses. In multivariable analysis only ten variables have over all significant effect on child‟s weight status at 5% level of significant.

This study has demonstrated that father‟s age, monthly household income, mothers‟ BMI, mothers education level, parents perceived child feeding responsibility, parents perceived child‟s weight status, parental monitoring, home availability of vegetables, family meals frequency and number of television in the home were shown statistically significant association with adolescents obesity. When the analysis was performed results revealed that father‟s age, mother‟s education level, parents perceived responsibility, parental monitoring level, home availability of vegetables and family meal frequency were a protective predictors of obesity status, while parental obesity status, monthly household income, parents perceived child‟s weight status and number of television in the home have a positive effect on the likelihood of being an obese among school children in multivariate analysis (Table 7).

Study participants (adolescents) living in households with fathers‟ age range 30-39 [Adjusted Odds Ratio (AOR of 0.14, 95%CI (0.03 – 0.79) ($p<0.005$) were less likely to be obese compared to those living in households with fathers‟ age range < 30 years family members. Similarly, adolescents living in households with monthly household income above 8000 Eth. Birr (AOR of 3.48, 95%CI (1.39 – 8.74) were more likely to develop child obesity than those adolescents living in households with monthly household income below 8000 Eth. Birr. Adolescents from overweight parents were about 13.3 times more likely to be obese compared to adolescents with normal weight parents (AOR of 13.27, 95%CI (3.67– 47.93) and adolescent‟s from obese parents were about 32.4 times more likely to be obese compared to adolescents with normal weight parents (AOR of 32.4, 95%CI (8.1 – 130.4).

Adolescents whose mothers had secondary or post-secondary education were less likely to be obese compared to children whose mothers had no formal or primary school education, as school adolescents had 78% lower odds of being obese if their mothers had attained a higher (at least a secondary school) education level compared to adolescents with mothers who had no formal education or a primary education level (AOR of 0.22, 95%CI (0.08 – 0.61).

Adolescents whose parents‟ perceived low responsibility for child feeding were more likely to develop obesity than children whose parents‟ perceive more responsibility to feed their child (AOR of 3.34, 95%CI (1.19 – 9.40). In a multivariable Logistic regression analysis comparing normal weight to obese children, parents perceived child‟s current weight status were positively and significantly associated with adolescent obesity (AOR of 3.31, 95%CI (1.30 – 8.40). Adolescents whose parents‟ perceived low parental monitoring score of intake were more likely to develop obesity compared to the adolescents whose parents‟ show more monitoring score (AOR of 11.8, 95%CI (3.88 – 35.94).

Adolescents whose family home food environment with availability of vegetable < 3 times per week were more likely to be obese than adolescents whose family home food environment with availability of vegetable more than 3 times per week (AOR of 4.45, 95%CI (1.67 – 11.89) and family meals frequency less than 5 times per week were more likely to be obese compared to the adolescents whose family meal frequency more than 5 times per week (AOR of 4.09, 95%CI (1.64 – 10.17). This study revealed that the adolescents in the family home environment with 2 or more television in the home shown 22.3 times higher likelihood of being obese when compared to their counterparts with 1 or less television in their home (AOR of 22.34, 95%CI (7.75 – 64.43) (Table -7). Logistic model for child weight status Hosmer and Lemeshow goodness-of-fit test produced chi-square of 8.61with p-value (0.4039) suggests that the model fits the data reasonably well.

Table 7: Multivariate analysis results adjusted for familial factors independently associated with adolescence obesity among primary school adolescents in Hawassa town, 2017 n=294

Exposure variables	Child Weight status		Bivariate analysis Crud OR with 95% CI				Multivariable analysis Adjusted OR 95% CI			
	Obese (n=100)	Normal (n=200)	**COR**	Lower	Upper	P-value	**AOR**	Lower	Upper	P-value
Fathers Age						<0.000				
< 30 R	0 (0.0)	2 (0.7)	**1**				**1**			
30 - 39	23 (7.7)	64 (21.3)	**0.21**	0.08	0.55		**0.14***	0.03	0.79	**0.026**
40 - 49	63 (21)	126 (42)	**0.29**	0.11	0.72		**0.12***	0.02	0.62	**0.011**
Monthly income (M)						<0.000				
< 8000 Eth Birr ***R***	34(11.3)	141(47.0)	**1**				**1**			
≥ 8000 Eth Birr	66(22.0)	59(19.7)	**4.64**	2.69	8.02		**3.48***	1.39	8.74	**0.000**
Mother BMI						<0.000				
Normal ***R***			**1**				**1**			
Overweight	43 [14.3]	67 [22.3]	**8.74**	3.88	19.73		**13.27***	3.67	47.93	**0.000**
Obese	49 [16.3]	23 [7.7]	**29.03**	12.13	69.44		**32.41***	8.70	130.43	**0.000**
Mothers education						<0.138				
No formal educa **R**	0(0)	4(1.3)	**1**				**1**			
Primary school	7(2.3)	25(8.3)	**0.45**	0.18	1.11		**0.23**	0.04	1.30	0.096
Secondary school	33(11)	74(24.7)	**0.72**	0.43	1.21		**0.22***	0.08	0.61	**0.004**
Above secondary	60(20)	97(32.3)	**0.39**	0.16	0.95					
Responsibility (MS)						<0.002				
Below mean	74(24.7)	112(37.3)	**2.24***	1.32	3.79		**3.34***	1.19	9.40	**0.022**
Above mean**R**	26(8.7)	88(29.3)	**1**				**1**			
Monitoring (MS)						<0.000				
Below mean	79(26.3)	85(28.4)	**5.09***	2.92	8.88		**11.80***	3.88	35.94	**0.000**
Above mean**R**	21(7.0)	115(38.3)	**1**				**1**			
Vegetable available						<0.000				
< 3 times	59	71	**2.61**	1.59	4.27		**4.45***	1.67	11.89	**0.003**
≥ 3 times R	41	129	**1**				**1**			
Perceived child's wt.						<0.000				
Overweight	56	36	**6.36**	3.61	11.21		**3.31***	1.30	8.42	**0.005**
Obese	6	5	**4.91**	1.41	17.07		**3.01**	0.32	28.14	0.334
Family meals freque.						<0.000				
< 5 times/wk	69	81	**3.27***	1.97	5.44		**4.09***	1.64	10.17	**0.002**
≥ 5 times/wk **R**	31	119	**1**				**1**			
Nº of TV in the home						<0.000				
≤ 1 ***R***	31	166	**1**				**1**			
≥ 2	69	34	**10.87**	6.19	19.06		**22.34***	7.75	64.43	**0.000**

****** The assessment made whether the required assumptions for the application of multivariate logistic regression was fulfilled showed that this parsimonious model adequately fits the data. (by using Hosmer and Lemeshow test), **R** = reference , **MS** = mean/composite scores*

****** Significant in multivariate analysis*

*

6. Discussion

The present case control study is the first in Hawassa town to examine associations between several energy balances related familial factors and adolescence obesity among primary school adolescents. Particularly, the study assessed: 1-parents socio economic and demographic background, 2- child feeding attitudes and practices of parents, 3-family home environment in relation to food, physical activity and sedentary life and, 4-parents‟ role modeling behaviour. The study also examined child‟s background, dietary intake and physical activity behaviour.

The current study indicates children socio demographic factors including age, sex, grade level and school type shown no significant association with their weight status. Different studies revealed that overweight and obesity was higher in boys (14.9 %) than girls (14.5 %), higher in children attending private schools (27.7 %) than public schools (5.9 %). Also studies shown the prevalence of overweight and obesity increased with age, for age group 10-14 was 12.5% and 0% respectively, whereas for age group 15-19 was 12.9% and 2.8% respectively. The sex specific prevalence of overweight and obesity was not consistent in the most of previous studies both overweight and obesity was higher for females than males. Additionally the odds of overweight and obesity in non-governmental school was higher than compared with the students from governmental school (10). This lack of consistency with other studies may be attributable to the fact that most previous studies utilized samples of high school children or younger adolescents. Other explanation for this result may be the small sample size unable to detect the differences.

Among parents‟ socio economic and demographic factors included in this study, fathers‟ age, household income, mother‟s education level and mothers‟ BMI shown significant association with the childhood obesity. These results are in line with other many studies. A recent review of cross-sectional studies published between 2005 and 2014 found that SES was inversely associated with children‟s overweight or obesity in 42 % of the reviewed studies, with the rest of the studies reporting a mixture of inverse or no associations (5). The choice of SES variable obviously influenced these relationships, with the evidence being less conclusive when using family income as a possible variable explaining childhood obesity, while parental education showed the most consistent inverse relationship with children‟s obesity risk.

The present study revealed paternal but not maternal age level seemed to be an important protective factor for adolescents‟ obesity, when analyzed at both the bivariate and multivariate level. Many studies results revealed that mother‟s age was a protective predictor for both girls‟ and boys‟ overweight/obesity status. The finding that the odds of developing overweight/obesity decreases with increasing maternal age could be partly explained by the notion that individual and as a consequence family health awareness is higher in mothers of advanced age.

Monthly household income was other independent variable which was strongly associated with adolescents‟ obesity as proxy indicator of nutritional status of the family. This study showed that high income of families were associated with being obese than those from low income families. This is the normal trend seen in economies in transition as people of affluent strata have more purchasing power to buy refined, calorie dense food in contrast to developed nations where fruits and vegetables are more expensive and high sugar and fat containing foods are available at a lower price (3). Keeping with the results of the present study, high proportion of obese school children were seen among higher socio-economic group in urban India (62). Cross sectional studies conducted by Tesfalem.et.al in similar setting (10) has also reported a clear socio-economic gradient in the prevalence of overweight and obesity, where children from higher household income families were seven times more likely to be overweight or obese as compared to children whose family from the lowest household income category (AOR=7.19 [95%CI: 2.6-19.89]) (10).

The present study also demonstrates that parental obesity status seems to be a highly influential factor on adolescents‟ obesity status. Particularly, when both parents were overweight or obese the likelihood of adolescents to be overweight or obese was greater than when children had no parent overweight/obese. An influence of parental obesity has been shown in many studies (21–23) and may be explained by genetic as well as environmental and behavioural factors since parents play a direct role in shaping children‟s eating and activity habits (24,25). In a recent study performed in Greece it was also shown that parental BMI status had the greatest effect on children‟s BMI classification, as children with two obese parents had 11.6 times higher likelihood of being over-weight/obese than their peers with normal-weight parents (26). These findings were confirmed in another study of Greek school children, in which children with one obese parent had greater odds for being overweight than those with no obese parent, while the likelihood for being overweight was 2.38 times greater for children with two obese parents (27).

Children learn about eating not only through their own experiences but also by watching others, and especially their parents, who act as role models. A growing body of research demonstrates similarities between parents‟ and children‟s food acceptance, preferences and intake (15).

Similar to other findings [38, 39], this study revealed that maternal obesity was more predictive of a child being in an obese BMI category than paternal obesity. There are a number of possible explanations for this. Mothers were nominated as the primary caregiver (the person who spent most time with the study child) for 98% of children who took part in this study. This indicates that children spend more time in their mother‟s environment and thus may acquire more behaviour from their mother. A study by Hannon et al. (21) found that the eating habits of the family food preparer, 84% of whom were mothers, predicted the eating habits of their child. Birth factors including the role of the intra-uterine environment on subsequent risk of childhood obesity is a second possible explanation (63). Many studies revealed that high rate of gestational diabetes in pregnant women causing higher birth weights in babies leading to inter-generational effects of obesity in childhood and its attendant‟s problem (36). However, this study found that only 2% mothers of obese children were reported that they have gestational diabetes diagnosis history than 1.7% mothers of healthy children, although there was no significant association.

This study found that maternal education level seemed to be an important protective factor for adolescent obesity, as school children had 78% lower odds of being obese if their mothers had attained a higher (at least a secondary school) education level compared to children with mothers who had no formal education or a primary education level. As reported in the literature, the most important socio demographic factor explaining children‟s obesity status is parental education level, which is consistently inversely associated with children‟s body weight and adiposity (5,11). Studies conducted in Brazil and Iran has reported lower educational status of mother as a risk factor for overweight and obesity in children (4). In contrast, study by Mwaikambo et.al.(2015) (27) in Tanzania found that children whose mothers had secondary or post-secondary education were more likely to be overweight or obese than children whose mothers had no formal or primary school education (COR = 3.6, 95 % CI = 2.4–5.6, p< 0. 0001). Similarly children whose fathers had secondary or post-secondary education were more likely to be overweight or obese than children whose fathers had no formal education or had primary education (COR = 2.8, 95 % CI = 1.8–4.5, p< 0.001) (27)

Another studies conducted in 12 countries supported our findings, that children from Brazil and the USA had 45% and 46% lower odds respectively of being overweight/obese if their fathers had attained a higher education level. Our results did reflect such a relationship, suggesting that the level of education of the parents is more likely to influence beliefs, knowledge on nutrition and health behaviours of the family, which in turn are involved in weight control through better nutritional and physical activity habits of the children (5, 12–14).

In opposition to our findings, results of studies conducted in 12 different countries, showed that maternal education was positively associated with childhood overweight/obesity for the Colombian and Kenyan sites. Children from Colombia and Kenya had a 1.9 and 4.8 times higher odds of being overweight/obese respectively, if their mothers had attained some college education or higher compared to children with mothers who had a lower education level. Similarly, Kenyan children had a 5.0 times higher odds of being overweight if their fathers had a higher education level, suggesting that relationships between maternal and paternal education & child weight status appear to be related to the developmental stage of different countries (30).

This contradiction between our result and other developing countries were supported by Ethiopian Demographic and Health Survey 2016, that mother‟s education and wealth quintile are both inversely related to children‟s stunting levels as well as the percentage of underweight children decreases with increasing mother‟s education (20). One hypothesis for our result that as most of respondents were selected from the private schools in middle class residential areas, more mothers were likely fall into the highly educated category (above high school).

Although parental occupation level did not seem to influence the odds for obesity in multivariate analysis, an interesting finding of this study was that maternal occupations appeared to influence the likelihood of the child being obese at the bivariate level. Study by Tolassa Wakayo.et al. (2016) in Adama supported our finding, students whose mothers were employed had 5.26 times more odds of being overweight and/or obese compared to their counter parts (AOR = 5.26 (1.09, 25.36)). One possible explanation for the finding that children whose mothers were in private business or self-employed had greater rates of obesity than children whose mother was a housewife is the possible difference in work hours. Although we did not specifically assess the hours of daily work of the parents, it could be hypothesized that self-employed and private employees in Hawassa have longer work schedules, keeping them outside the home.

This is probably associated with the time dedicated to nutritional guidance of the child, as well as both the quality and quantity of the child‟s diet (15–17).

Other socio-economic variables included in this study were not independently associated with adolescents‟ weight status. Many studies also support that socio-economic variables (maternal age, occupation of father, educational level and family size of the house hold) were not significantly associated with the outcome variable (64, 65).

Perceived responsibility score observed in this study shown statistically significant inverse association with adolescents‟ obesity. Parents may be less likely to determine their child‟s portion size and more likely to encourage them to eat. In addition, parents may be less likely to determine right kind of foods for their child‟s. This may indicate the cultural influence, ethnic variation in feeding attitudes and practices and knowledge deficiency on basic nutrition and risk of junk foods. Birch‟s study also found that responses to the perceived responsibility to child feeding items across different ethnic groups were not identical (58).

The efforts parents make to maintain the correct body weight in children indicates parental awareness of overweight and obesity related health risks. Parental perception of a child‟s body mass may, therefore, play a key role in decisions associated with the adopted lifestyle. According to our observations across the group of children who presented with confirmed normal weight and obese, as many as 53% of their parents incorrectly assessed their body mass. This study showed that 45% of normal children and 11% of obese children are perceived as having normal weight. In the group of children with normal weight-to-height proportions (BMI), 8% of the parents declared their normal weight children to be underweight, 13.7% of them also declared overweight.

Overall, parents‟ perception of their children‟s weight status had a statistically significant positive association with adolescents‟ actual BMI. This finding is consistent with the previous body of literature revealing disagreement between parental perception and their child‟s weight status (35). Most studies demonstrated that mothers scarcely perceive the nutritional status of their children, tending to under-estimate it, especially in cases of overweight and obesity (36).

Study conducted by Kaufman-Shriqui.et.al(2013) on children to native-Israeli parents and immigrants came from different country including Ethiopia and other East Africa reported, more than 82% of mothers underestimated their child‟s weight status, 74.2% of overweight/obese children were perceived as normal-weight and 8% as thin. In a multivariable logistic-regression analysis comparing normal-weight to overweight/obese children, maternal underestimation of the child‟s weight status (OR=7.5; 95%CI: 3.4–16.5, P-0.0001) were associated with overweight or obese. The finding of current study also shown the same result as 39.3% of the parents underestimated their child‟s weight status and 31.3% of these were by the parents of obese children. This fact deserves attention, since if the excess weight is not noticed, the child or adolescent will not likely be candidate for lifestyle change.

This study result shown that parental monitoring level was inversely associated with adolescents‟ BMI z-scores. Parents with normal weight children used more monitoring score than those with obese children, while parents with obese children kept less track of their eating. This result is in line with other many studies which shown the parental monitoring over a two-year period showed a reduced BMI (29).

Among obesity related parenting practices examined in this study, however there was no significant association in multivariate analysis between parents‟ concern about overweight and children‟s BMI z-scores, parents showed some concern about overweight in their children. Over 40% of parents indicated that they were concerned about the child becoming overweight or having to diet, and 37% were concerned about their child eating too much away from parents‟ observation. Several studies have examined parental cognitions, such as concern for child weight, as mediators for feeding practices (e.g., restrictive or pressuring feeding practices increase only when parents become concerned about their children‟s weights) (66). This result is in agreement with many other investigations. Faith et al. studied feeding attitudes and styles on a child‟s BMI by comparing these attitudes with obesity in high-risk families, child weight concern and perceived child weight were both positively associated with BMI. These predictive factors such as weight concern and perceived child weight showed an increased BMI while parental monitoring over a two-year period showed a reduced BMI (59).

The present study revealed only home availability of vegetables and family meal frequency remained independent predictors of child obesity in the multivariate analysis. These findings on the relationship between family food environment and children‟s weight status are consistent with previous studies (42) factors in the family environment including parental intake of soft drinks and fruit and vegetables, home availability of these foods, and frequency of family meals were associated with adolescents‟ obesity.

The family food environment assessed in this study was generally negative with regards to food availability and family eating patterns; unhealthy elements were observed in many families, such as having soft drinks, sweets and fried foods available at home most of the time and less family meal. Most families (80.3%) had soft drinks available at home 2 days or more per week. The least available food was fruit. Only, 37.3% of families had fruit available 2 days or more per week.

The current study showed that many families had unhealthy elements in their food environment. Regression analysis was conducted separately for food availability at home and eating patterns with children‟s BMI z-scores. The results did show statistically significant association of vegetable availability and family meals patterns with children‟s BMI z-scores. These findings suggest that the positive relationship observed between parents‟ intake, food availability and child‟s BMI z-scores is not merely due to the greater presence of these foods in the home because both parents and children eat them, but also that dietary behavior can be instilled in children through parental modeling of intake.

In the current study, half (50%) of families (10% from cases and 40% of controls) ate dinner together at home 5 days or more per week. Family meal frequency showed a significant inverse association with children BMI z-scores, with less than 5 family meal frequency per week increases the likelihood of obesity 4.1 times higher. This finding supports the causal effect of less family meals on children‟s overweight revealed by different studies. A growing body of research demonstrates children who eat meals with other family members consume more healthy foods and less energy dense food. Cross-sectional studies in China, Project Eating Among Teens (EAT) and other adolescent samples have reported that frequent family meals are associated with fewer skipped breakfast meals, higher intakes of fruit, vegetables, calcium-rich foods, and key nutrients (e.g. calcium and foliate); and lower intake of soft drinks (27).

Though association was observed in the cross-section analysis, the longitudinal analysis in Taveras.et al.‟s study (2005) did not reveal the relationship between the likelihood of being overweight or obese and frequency of family meal. This may be due to the mealtime policies differences in different ethnic and socio economic status of the parents.

In the current study, relationships were observed between availability of media resources in the home, especially, number of televisions in the home and adolescents‟ BMI. This study revealed that the adolescents in the family home environment with 2 or more TV in the home shown 22.3 times higher likelihood of being obese than compared their counterparts with 1 or less TV in the home. This result is in line with other studies which shown the number of media resources and televisions in the home associated with child‟s weight status because children spend more time on the computer or playing video games, if the media resources were easily accessible, at the expense of sleeping, an emerging risk factor for obesity and children with a TV in their room spend an estimated 1.5 hours more a day watching TV than do those without a set in their room (40).

7. Strengths and Limitations

7.1. Strengths

The first case control study design in country which focus on parental influence of adolescents‟ obesity by including comparison groups. Increased strength of comparison by using tow healthy study participants for each cases to compare (case to control ratio = 1: 2)

Objectively measured BMI of both parents and children were used rather than self-report. This study has been able to assess adolescents‟ actual energy intake. Previously validated questionnaire was used to measure physical activity and child feeding practices of study participants. Private and governmental schools were included to detect the differences.

7.2. Limitations

This study had some limitations, which may have influenced the findings.

During selection, it could happen that the most overweight/obese children in the class were selected as a result we suspect selection of cases might have modest impact on study outcome.

The responses were based on self-recall and some of the events may be difficult to remember and hence the effect of recall bias may exist as it is a recurring problem with any retrospective study; however, this limitation may be tolerable considering the goals of the questionnaire and previous studies support the validity of this methodology in school-aged children (67).

In the current study all data, including dietary intake, activity behavior and household income/ SES, were reported by the parents, which may have led to bias due to measured indirectly by asking some relevant questions (social disairability bias).

As a result, unmatched case control study design was used little overlap may occur between cases and controls in the distribution of the confounding variables and lead to bias estimation of odds ratio. Family composition/structure was not assessed in this study, and it may be a confounder for some parts of our results. Despite these limitations, this study provided some data on familial risk factors of primary school children and adolescents obesity.

8. Conclusions and Recommendations

8.1. Conclusions

In Hawassa, the number of obese children in urban primary schools is high. This study has attempted to investigate and come up with certain results out of which this conclusion emerged. The study demonstrated that several child behaviour and familial risk factors contribute to this phenomenon. Child‟s behaviour related factors such as limited physical exercise at home, high energy dense foods intake and high level of sedentary lifestyle were associated with obesity among urban school children in Hawassa, South Ethiopia. Many familial factors such as overweight parent, less responsible parents on decision of child‟s food portion size, and less monitoring frequency of child‟s healthy food intake were found to be the most contributing familial factors in reducing childhood obesity as well as curbing associated chronic non communicable diseases. Among the factors considered in this study parents overweight/obesity by far stands as a powerful predictor of childhood obesity.

The parents‟ perception of children‟s weight status is important and relevant to the motivation of the parents to adopt weight control behavior. Parents are more concerned about their child being underweight than being overweight. The misperception and inappropriate concern may lead to problematic child feeding practices. Accurate estimation of children‟s weight status can facilitate parents and children to make a healthy change in their diet and lifestyle. This study showed the proportion of mothers who inadequately perceived the nutritional status of their children was high, and was the most common underestimation for children with obesity. Despite the increasing prevalence of obesity in children, mothers have difficulty in properly perceiving the nutritional status of their children, which may compromise lifestyle change decision of the parents (37).

8.2. Recommendations

Based on the findings of this study, the following recommendations are made:

- Parents should encourage healthful eating habits at home by increasing the number of family meals eaten together, making healthful foods available, and reducing the availability of sugar-laden beverages & media resources and acting as role models to eating right instead of pushing their child eat certain food.
- Parents and teachers should encourage adolescents to be physically active by limiting screen time and promoting active transport to and from school to promote health and reduce obesity.
- Availability or accessibility and correct use of anthropometry measuring devices or any valid charts helping monitoring child weight status in schools should be encouraged.
- Ministry of health should develop policy and enforce its implementation to help fight the rising epidemic of obesity in children & help curb the huge economic burden of obesity.
- Ministry of education should incorporate obesity related education in school curriculum of children and adolescents.
- Adolescents and their families should receive health education on diet and physical activity. Additionally school based preventive program should be set and private schools should be the first target for intervention.
- Public health programs are warranted to increase awareness on these risk factors among children and adolescents in order to reduce the future burden of obesity-associated chronic diseases
- Longitudinal studies are needed to better assess influence from parents and clarify the causality of those associations of feeding and weight status among these populations.

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Annexes

Annex-1:-Conceptual framework

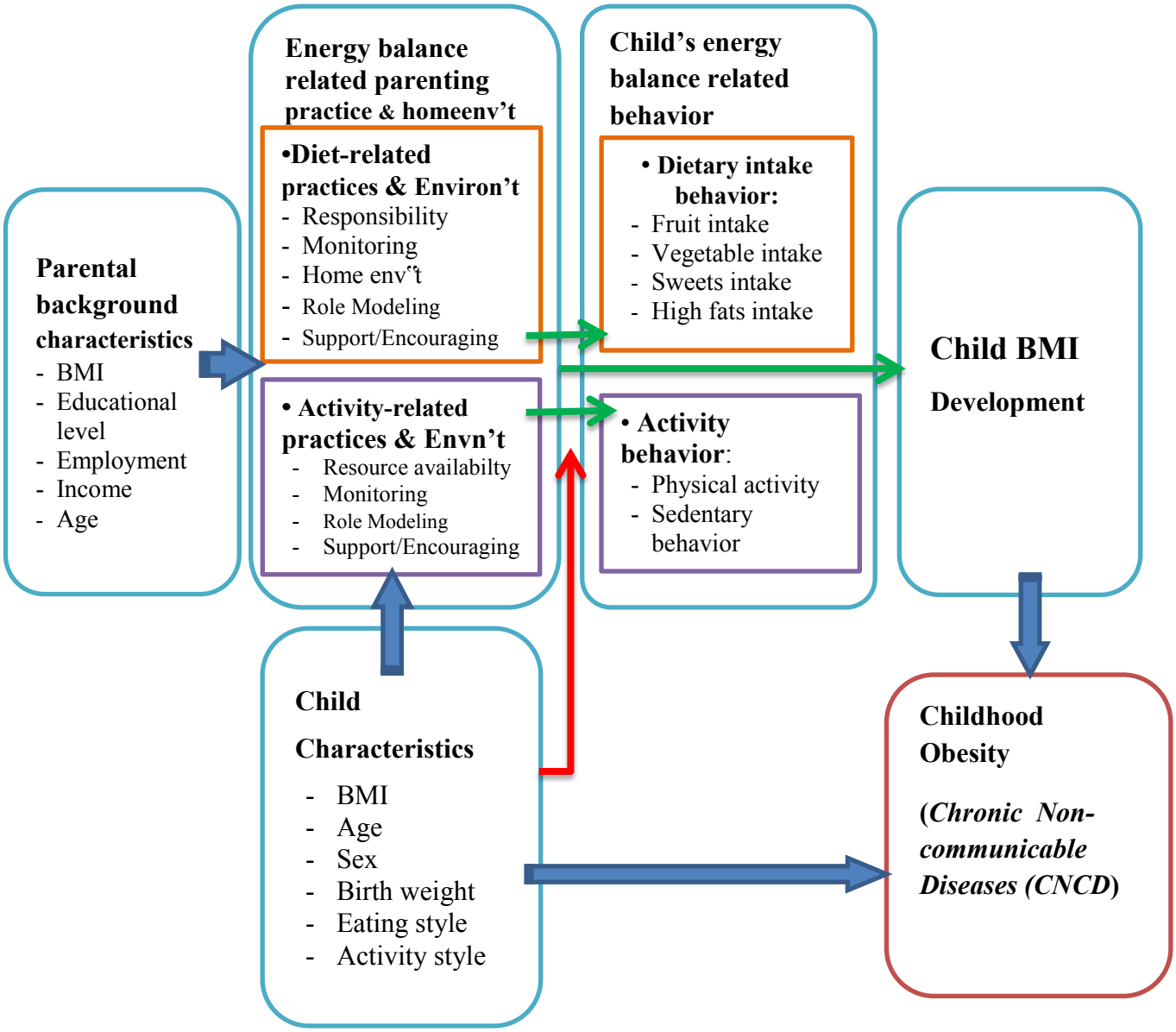

Figure-3: Conceptual framework (model) of energy-related parenting
(Adapted from Gubbels.et.al. (35) 2011)

Annex 2:- Assent for child's parents

Cover Letter for Parents (English and Amharic)

The Adolescents' obesity Study among primary school children

You are being invited to take part in a survey to help us learn more about eating behaviors. Please take your time to read the following information carefully and decide whether you want to participate.

We will conduct surveys among parents of middle-school students. This study aims to assess parents‟ attitudes and behaviors about feeding your child. We ask the parent who cooks the family meals most of the time to answer the questionnaire.

The survey will take about 30 minutes to finish. The information you provide will help us understand influences of parents and home food environment on children‟s eating behaviors. The findings from the study will provide evidences for effective intervention of healthy eating among children.

In addition, we ask your consent to measure height and weight of you and your child. Students‟ names will not indicate on data the survey. No identification information will be involved in final data analysis and reports.

Your participation is entirely voluntary and anonymous. You can refuse to participate without any penalty or loss of benefits to your child. You are free to withdraw your participation at any time during the study without any adverse consequences from your child‟s school or teacher.

Your answers and your child‟s information will be kept confidential. The information will only be accessible by the researcher and be used only for research purpose. If you have any question about the study or are interested in the findings of the study, you can contact Medhin Geta through email: medinsurance80@gmail.com (or call +251912066294), or Dr. Girma Taye (PhD) at Addis Ababa University. (Tel: +251911769926 or E-mail: girmataye2009@gmail.com)

If you agree on participation, please complete the survey and ask your child to turn it in the next school day. More instruction about how to complete the survey is provided in the questionnaire. When you complete the survey, you automatically consent to let us use the information in this research.

Thanks for your time and cooperation!

Researcher: Medhin Geta, Master‟s student

Advisor: Dr. Girma Taye (PhD), Associate Professor

Addis Ababa University, School Of Public Health

Cooperator: Yimer Seid (MPH), Addis Ababa University

ANNEX 3: English Version of Participant's Consent and Information Sheet for Students.

Addis Ababa University, College of Health Sciences, School of Public Health Questionnaire to assess familial correlates of childhood obesity among primary school children in Hawassa town

Greeting;

How are you, I am Medhin Geta. I am working in the research team of Addis Ababa University, College of Health Science, School of Public Health, and Department of Preventive Medicine. I would like to ask you a few questions about your personal characteristics, eating habit, physical exercise, your willingness for weight and height measurements. This will help us to improve the prevention and control activities of child hood overweight and obesity in Hawassa based on the information you provide us. Your name will not be written in this form and will never be used in connection with any information you tell us. All information given by you will be kept strictly confidential. Your participation is voluntary and you are not obligate to answer any question which you do not wish to answer. If you fill discomfort with the interview, please fill free to drop it any time you want. This interview will take about 30 minutes. Could I have your permission to continue?

1. If yes, continue the interview.
2. If no, skip to the next participant by writing reasons for his/her refusal.

For any questions you have, you can contact the Principal Investigator by: 09 12 06 62 94

Informed consent Certified by

Interviewer: Code_____Name_____signature_____

Date of interview _____Time started _____Time completed_____

Result of interview: -1. Completed 2.Respondent not available 3.Refused 4. Partially completed

Checked by Supervisor: Name _____ Signature_____

ANNEX 4:-Questionnaires for Overweight/Obesity Risk Factor assessement for students

Participant Identification Number _____

Question	Response	Code
Sex	_____	
Age	_____	
Grade	_____	

Location and type of school			
	Question	**Response**	**Code**
1	Name of the school		
2	Sub city		
3	Kebele		
4	Type of school	1. Public/ Government 2. Private /Mission	

Behavioral Question

Dieting Habit

The next questions ask about fruits and vegetables that you usually eat. As you answer these questions please think of a typical week in the last year

	Question	Response	Code
5	In a typical week on how many days do you eat fruit?		
6	How many serving of fruit do you eat on one of those days?		
7	In a typical week on how many days do you eat vegetables?		
8	How many servings of vegetables do you eat on one of those days?		

Dieting Habit

The next questions ask about your dieting habit for the last one year.

	Question	Response	Code
9	List up to five foods you like most	1.---------- 2. ---------- 3. ----------	
10	List up to five foods you dislike most	1.---------- 2. ---------- 3. ----------	
11	Do you ever have a snack?	1. Yes 2. No if no go to D8	
12	If your answer is yes what do you have for snack?	----------	
13	How many times a day do you have snack?	----------	
14	How many meal do you have a day other than snacks?	----------	

15	How do you get your lunch?	1. Bring from home 2. Buy from school cafeteria 3. Buy from nearby food service establishment. 4. I did not use lunch	
16	List foods that you ever bought in addition to the regular meal.	1. Cake 2. Biscuit 3. Ice cream 4. Chocolate 5. Others specify----------	
17	Do you buy foods when you go to movies?	1. Yes 2. No 3. I did not go movies	
18	Do you have a television in the room where you sleep (bedroom)?	1. Yes 2. No	
19	When you Watch television do you eat?	1. Yes 2. No 3. I did not watch television	
20	When you study do you eat food?	1. Yes 2. No	
21	Do you always eat your breakfast?	1. Yes 2. No	
22	Do you have habit of missing any of your meal schedules?	1. Yes 2. No	

Physical Activity

Next I am going to ask you about time you spend doing different physical activities in a typical week.

Activity at work

	Question	Response	Code
23	Do you engaged in Work besides your education?	1. Yes 2. No	
24	If your answer in Q 23 is yes does your work involve vigorous –intensity activity that cause large increases in breathing or heart rate for at least 10minutes continuously?	1. Yes 2. No	
25	In a typical week on how many days do you do vigorous –intensity activities as part of your work?	Number of days ----------	
26	How much time do you spend doing vigorous –intensity activities at work on a typical day?	Hours: minutes ----------	
27	Does your work involve moderate- intensity activity that causes small increases in breathing or heart rate for at least 10 minutes continuously?	1. yes 2. No if no go to P8	
28	In a typical week on how many days do you do moderate –intensity activities as part of your work?	----------	
29	How much time do you spend doing moderate –intensity activities at work on a typical day?	Hours: minutes ----------	

Travel to and from places

Now I am going to ask you about the usual way you travel to and from places.

	Question	Response	Code
30	Do you walk or use a bicycle for at least 10 minutes continuously to get to and from places?	1. Yes 2. No	
31	In a typical week on how many days do you walk or use a bicycle for at least 10 minutes continuously?	Days:----------	
32	How much time do you spend walking or bicycling for travel in a typical day?	Hours: minutes----------	

Recreational Activities

Now I would like to ask you about sports, fitness and recreational activities

	Question	Response	Code
33	Do you do any vigorous-intensity sports that cause large increases in breasting or heart rate for at least 10 minutes continuously?	1. Yes 2. No if no go to P14	
34	In a typical week on how many days do you do vigorous –intensity sports, fitness or recreational activities?	----------	
35	How much time do you spend doing vigorous – intensity sports, fitness or recreational activities in a typical days?	Hours: minutes ----------	
36	Do you do any moderate-intensity sports that cause small increases in breathing or heart rate for at least 10 minutes continuously?	1. Yes 2. No if no go to P 17	
37	In a typical week on how many days do you do moderate –intensity sports, fitness or recreational activities?	----------	
38	How much time do you spend doing moderate – intensity sports, fitness or recreational activities in a typical days?	Hours: minutes ----------	
39	Do you play in your compound outside your home?	1. Yes 2. No	
40	If your answer to Q 39 is No, why?	_____	

Sedentary Behavior

The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent(sitting at a desk sitting with friends, traveling in a car, bus, reading, playing card or watching television), but not include time spent sleeping

	Question	Response	Code
41	How much movies do you watch in your typical day?	----------	
42	How much time do you usually spend sitting on a typical day?	Hours: minutes ----------	

Physical Measurements

	Measurements	Response	Code
43	Height in centimeters(cm)	cm:_____	
44	Weight in kilograms (kg)	kg:_____	
	Thank You for Your Time and Cooperation!		

ANNEX 5: English Version of Participant's Consent and Information Sheet for Child's Parent

Addis Ababa University, College of Health Sciences, School of Public Health Questionnaire to assess familial correlates of childhood obesity among primary school children in Hawassa town

Greeting;

How are you, _____. I am working in the research team of Addis Ababa University, College of Health Science, School of Public Health, and Department of Preventive Medicine. I would like to ask you a few questions about your lifestyle, income, and education status and your willingness for your child participation in our study. We will take measurement of your height, weight and your child‟s height and weight. We will also ask your child eating habit and physical activity. This will help us to improve the prevention and control method of childhood overweight and obesity in Hawassa based on you and your child‟s information. You and your child name will not be written in this form and will never be used in connection with any information you tell us. All information given by you and your child will be kept strictly confidential. Your participation is voluntary and you are not obligate to answer any question which you do not wish to answer. If you fill discomfort to respond to the questioner, please fill free to drop it. This questionnaire will take about 30 minutes. Could I have your permission to continue?

1. If yes, continue to fill the question.
2. If no, stop filling the question by writing reasons for his/her refusal.

For any questions you have, you can contact the Principal Investigator by: 09 12 06 62 94

Informed consent Certified by

Interviewer: Code_____Name_____signature_____

Date of interview _____Time started _____Time completed_____

Result of interview: -1. Completed 2.Respondent not available 3.Refused 4. Partially completed

Checked by: Supervisor: Name _____ Signature_____

ANNEX 6: **Questionnaire for Overweight Risk Factor related to Student Parent**

Participant Identification Number _____

	Location	Response	Code
1	Sub city	_____	
2	Kebele	_____	
3	Specific name of the village	_____	

	Question	Response	Code
4	I am the child"s _____ who is answering the questionnaire.	1. Mother 2. Father	
5	Who in the family cooks meals for the family most of the time?	1. Mother 2. Father	
7	Gender of your child:	1. Male 2. Female	
9	Mother"s age	_____	
10	Father"s age	_____	
11	Mother"s weight Mother"s height	_____.__kg _____ cm	
12	Father"s weight Father"s height	_____.__kg _____ cm	
13	Average monthly family income (including both parents" income) (For example, if the father and the mother both earn 2000 Birr a month, the monthly family income is 4000 Birr; if only one parent works or it is a single-parent family, the monthly family income is the monthly income of the parent.)	_____Birr	
14	Mother"s highest education level	1. Elementary school or less 2. Middle school 3. High school 4. College and/or Graduate school	
15	Father"s highest education level	1. Elementary school or less 2. Middle school 3. High school 4. College and/or Graduate school	
18	Mothers" occupational status_	1. Housewife 2. Merchant 3.Government employee 4. Private work 5. Daily laborer 6. NGO 7. Others_____	

19	Fathers" occupational status_	1. Farmer 2. Merchant 3.Government employee 4. Private work 5. Daily laborer 6. NGO 7. Others_____	
20	How many people including yourself, live in your household?	_____	
21	Is there vehicle to transport family from place to place?	1.Yes 2. No	
22	Have you ever been diagnosed pregnancy related Diabetes Mellitus in any of your pregnancy?	1.Yes 2. No	
	Physical Activities-Related Family Environment **a) Home Physical Activities Resources**		
23	Please indicate which items you have in your home, yard, or apartment complex that are available to your children: a. Stationary aerobic equipment (bicycle, treadmill, etc.)_ b. Bicycle ___ c. Weight lifting equipment (free weights, Nautilus, etc.)_ d. Exercise workout videotapes or DVDs ___ e. Sports equipment (balls, racquets, jump ropes, etc.)___ f. Stretching or yoga equipment ____	1. Yes 2. No	
	b) Parental Total Physical Activities (PA) & MVPA		
24	In the past week (7 days), how many HOURS did you spend doing the following activities? _Strenuous exercise (heart beats rapidly) examples: biking fast, aerobic dancing, running, jogging, swimming laps, rollerblading, skating, tennis, cross-country skiing, soccer, basketball	1. none 2. one hour 3. two hours 4. three hours 5. four hours 6. five hours 7. six hours 8. ≥ 7 hours	
25	_Moderate exercise (not exhausting) examples: walking quickly, dancing, baseball/softball, gymnastics, easy bicycling, volleyball, strength training	1. none 2. one hour 3. two hours 4. three hours 5. four hours 6. five hours 7. six hours 8. ≥ 7 hours	
26	_Mild exercise (little effort) examples: walking slowly, bowling, yoga, stretching muscles, household chores	1. none 2. one hour 3. two hours 4. three hours 5. four hours 6. five hours 7. six hours 8. ≥ 7 hours	

	c) Family Support for Physical Activities		
27	During a typical week, how often have you or another member of your household encouraged your child to do physical activities or play sports?	1. never 2. rarely 3. sometimes 4. mostly 5. every day	
28.	During a typical week, how often have you or another member of your household done a physical activities or played sports with your child?	1. never 2. rarely 3. sometimes 4. mostly 5. every day	
29	During a typical week, how often have you or another member of your household provided transportation to a place where your child can do physical activities or play sports?	1. never 2. rarely 3. sometimes 4. mostly 5. every day	
30	During a typical week, how often have you or another member of your household watched your child participate in physical activities or sports?	1. never 2. rarely 3. sometimes 4. mostly 5. every day	
31	During a typical week, how often have you or another member of your household told your child that she/he was doing well in physical activities or sports	1. never 2. rarely 3. sometimes 4. mostly 5. every day	
32	How often do you praise your child for being physically active? [a reinforcement]	1. never 2. rarely 3. sometimes 4. mostly 5. every day	
	Television(TV)-Related Family Environment **a) Media Resources**		
33	Please indicate which of the following you have in your home: a. Pay television (cable, satellite, etc.)____ b. Video/DVD player ____ c. Electronic game (Play station, etc.) ____ d. Computer ___ e. Internet access ____	1.Yes 2. No	
	b) Number of TVs in home		
34	How many televisions do you have in your home?	1. zero 2. one 3. two 4. three 5. four or more	
	c) Television in bedroom		
35	Do you have a television in the room where you sleep?	1.Yes 2. No	

	d) Parental television use		
36	On a typical weekday (Monday through Friday), how many hours do you spend doing the following? _Watching TV/Videos/DVDs	1. zero 2. 1hour 3. 2hours 4. 3hours 5. 4hours 6. 5hours 7. 5 or more hours	
37	On a typical weekend day (Saturday and Sunday), how many hours do you spend doing the following? _Watching TV/Videos/DVDs	1. zero 2. 1hour 3. 2hours 4. 3hours 5. 4hours 6. 5hours 7. 5 or more hours	
	e) Familial encouragement to decrease television use		
38	During a typical week, how often have you or another member of your household encouraged your child to watch less TV?	1. never 2. rarely 3. sometimes 4. mostly 5. every day	
	Dietary intake-Related Family Environment **a) Home availability of Fruit and Vegetables (FV)**		
39	In the past 7 days vegetables were available in my home	1. never 2. rarely 3. sometimes 4. always	
40	In the past 7 days vegetables were served at meals in my home	1. never 2. rarely 3. sometimes 4. always	
41	In the past 7 days fruit was available in my home	1. never 2. rarely 3. sometimes 4. always	
42	In the past 7 days fruit was served at meals in my home	1. never 2. rarely 3. sometimes 4. always	
	b) Home availability of Unhealthy food & Soft drink		
43	In the past 7 days, regular soda pop or other sugar-sweetened drinks were available in my home	1. never 2. rarely 3. sometimes 4. always	
44	In the past 7 days, regular soda pop or other sugar-sweetened drinks were served at meals in my home	1. never 2. rarely 3. sometimes 4. always	

45	In the past 7 days, chips or other salty snacks were available in my home	1. never 2. rarely 3. sometimes 4. always	
46	In the past 7 days, candy was available in my home	1. never 2. rarely 3. sometimes 4. always	
	c) Parental Soft drink intake		
47	Thinking back over the PAST WEEK, how often did you drink regular soda pop (not diet)?	1. none 2. one 3. two 4. three 5. four 6. five or more servings	
	d) Parental Fruit and Vegetables (FV) intake		
48	Thinking back over the PAST WEEK, how many servings of FRUIT did you USUALLY eat on a typical day? A serving would be a medium piece of fruit or ½ cup of fruit. Do not include fruit juice.	1. none 2. one servings 3. two servings 4. three servings 5. four servings 6. five or more servings	
49	Thinking back over the PAST WEEK, how many servings of VEGETABLES did you USUALLY eat on a typical day? A serving would be a ½ cup of cooked vegetables or 1 cup of raw vegetables. Do not include potatoes or French fries (chips).	1. none 2. one servings 3. two servings 4. three servings 5. four servings 6. five or more servings	
	e) Familial encouragement to eat healthy food		
50	During a typical week, how often have you or another member of your household encouraged your child to eat healthy foods?	1. never 2. rarely 3. sometimes 4. mostly 5. every day	
51	How often do you praise your child for eating a healthy snack (food)?	1. never 2. rarely 3. sometimes 4. mostly 5. every day	
	f) Family meal frequency		
52	During the past 7 days, how many times did all or most of your family living in your house eat a meal together?	1.0 times 2. one times 3. two times 4. three times 5. four times 6. five times 7. six times 8. seven times 9. > 7 times	

	g) Fast food family meal frequency		
53	During the past 7 days, how many times was a family meal purchased at a fast food restaurant (McDonalds, pizza, burger, etc.) and eaten either at the restaurant or at home?	1.0 times 2. one times 3. two times 4. three times 5. four times 6. five times 7. six times 8. seven times 9. > 7 times	
Thank You for Your Time and Cooperation!			

ANNEX 7:- Amharic Version of the Assent

የተሳታፊ መለያ ቁጥር----------

አዲስ አበባ ዩኒቨርስቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና አጠባበቅ የፕሪቬንትቭ ሜድስን ትምህርት ክፍል
ከጤና ጋር የተያያዘ የምርምር ወይም ጥናታዊ ጽሁፍ መረጃ ለመሰብሰብ የተዘጋጀ ቃለመጠይቅ

የጥናቱ መግለጫና የፈቃደኝነት መግለጫ ቅፅ

ጤና ይስጥልኝ!

በአዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ በህብለተሰብ ጤና የትምህርት ክፍል ፕረቬንትቭ ሜድስን መስክ የዴህረ ምረቃ ተማሪ ነኝ፡፡ ስሜ መድኅን ጌታ ይባላል፡፡ በልጅነት ጊዜ የሚከሰት ከመጠን ያለፈ ዉፍረትና ተያያዥ መንስኤዎች ላይ በአንደኛ ደረጃ ተማሪዎች ላይ ለሚደረገዉ ምርምር ቃለ መጠይቅ ለማድረግነው። በቃለ መጠይቁ እርስዎ እና ይህንን ደብዳቤ ያመጣው ልጅዎ እንድትሳተፉ የእርስዎን ፈቃደኝነት እጠይቅዎታለሁ፡፡ በዚህ ከልጆች ጤና ጋር ለተያያዘ ምርምር ስለቤተሰብዎ የተወሰኑ ጥያቄዎችን ስለማህበራዊና ደሞግራፊያዊ ሁኔታ፣ ስለአመጋገብ፣ ሰለአካላዊ እንቅስቃሴና በመቀመጥ ስለሚያሳልፉት ጊዜ በተመለከተ እጠይቅዎታለሁ። ከዚህ በተጨማሪ የእርስዎን እና ይህንን ደብዳቤ ያመጣውን ልጅዎን ክብደት እና ቁመት መጠን እንለካለን:: ከእርስዎና ከልጅዎ የምናገኘው መረጃ ከክብደት መጨመር ጋር ተያይዘው የሚመጡ በዓለም ደረጃ በተለይም በታዳጊ ሀገሮች በከፍተኛ ፍጥነት እየጨመረና ትልቅ ጉዳት እያስከተለ ያለዉን የልጆች የጤና ችግሮችን ለመከለከል እቅድ ለማውጣት ይረዳናል:: ከእርስዎ ወይም ከልጅዎ የምናገኘውን መረጃ በሚስጥር እንጠብቃለን የእርስዎም ሆነ የልጅዎ ስም በቃለ መጠይቁ ላይ አይጻፍም:: የሚሰጡን መረጃ ከስምዎ ወይም ከልጅዎ ስም ጋር አይያያዝም:: በምርምሩ ስለተሳተፉ በእርስዎም ሆነ በልጅዎ ላይ የሚደርስ ምንም ዓይነት ጉዳት የለም፡፡ በዚህ ጥናት ዉስጥ ለመሳተፍ በቅድሚያ የተሳታፊዉን ፈቃደኝነት እንጠይቃለን። መልስ መስጠት የማይፈልጉበት ጥያቄ ካለዎት ለመመለስ አይገደዱም። በዚህ ጥናት ለመሳተፍ ፈቃደኛ ነዎት?

1. አዎ
2. አይደለሁም

ፍቃደኝነትዎን፣ ፍቃደኛ ካልሆኑም ፍቃደኛ ያልሆኑበትን ምክንያት ቀጥሎ ባለው ክፍት ቦታ ላይ ጽፈው ፖስታዉን አሽገዉ ይላኩልን::

ለማንኛውም አይነት ጥያቄ ዋና አጥኚውን ማነጋገር ይችላሉ፡፡ **የሞባይል ስልክ ቁጥር፡ 09 12 06 62 94**

እናመሰግናለን

አዲስ አበባ ዩኒቨርስቲ የጤና ሳይንስ ኮሌጅ የሕብረተሰብ ጤና የፐረቬንትቭ ሜድስን ትምህርት ክፍል
ከጤና ጋር የተያያዘ የምርምር ወይም ጥናታዊ ጽሁፍ ለመረጃ መሰብሰቢያ የተዘጋጀ መጠይቅ

የጥናቱ መግለጫና የፈቃደኝነት መግለጫ ቅፅ

ሰላምታ: እንደምን ነህ/ነሽ

ስሜ ----------ይባላል። እዚህ የመጣሁት በአዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ በህብለተሰብ ጤና የትምህርት ክፍል ፕረቬንትቭ ሜድስን መስክ የዴህረ ምረቃ ተማሪ የሆነውን መድኅን ጌታን ወክዬ ከመጠን ያለፈ ወፍረትና ተያያዥ መንስኤዎች ላይ በአንደኛ ደረጃ ተማሪዎች ላይ ለሚደረገዉ ጥናትቃለ መጠይቅ ለማድረግ ነው።በቃለ መጠይቁ እንዲሳተፉ የእርስዎን ፈቃደኝነት እጠይቅዎታለሁ፡፡ ለማጠናው ጥናት የተወሰኑ ጥያቄዎችን እጠይቅሃለሁ/ሻለሁ። በዚህ መጠይቅ የአመጋገብ ልምድ፣ ስለአካላዊ እንቅስቃሴ፣ በመቀመጥ የምታሳልፈውን/ፊዉን ጊዜ በተመለከተ እጠይቅሃለሁ/ሻለሁ። ከዚህ በተጨማሪ የአንተን /ያንቺን ክብደት እና ቁመት መጠን እንለካለን። ከአንተ/ቺ እና ከቤተሰብህ/ሽ የምናገኘውን መረጃ ከክብደት በመጨመር ጋር ተያይዘው የሚመጡ የልጆች የጤና ችግሮችን ለመከላከል እቅድ ለማውጣት ይረዳናል። ከአንተ/ቺ እና ከወላጅህ/ሽ የምንሰበስበው መረጃ በሚስጥር እንጠብቃለን። ከአንተ/ቺ እና ከወላጅህ/ሽ የምንሰበስበው መረጃ ከአንተ/ቺ እና ከወላጅህ/ሽ ስም ጋር አይያያዝም ። በዚህ ጥናት ውስጥ ለመሳተፍ በቅድሚያ የተሳታፊውን ፍቃደኝነት እንጠይቃለን። መልስ ለመስጠት የማትፈልግበት ወይም የማትፈልጊበት ጥያቄ ካለ አትገደድም/ጅም ።

በዚህ ጥናት ለመሳተፍ ፈቃደኛ ነህ/ነሽ?
1.አዎ
2.አይደለሁም
መልሱ "አይደለሁም" ከሆነ አመስግነው መጠይቁን ያቋርጡ፡፡ ለጥናቱ ፈቃደኛ ያልሆኑበትን ምክንያት በመጠየቅና በማስታወሻዎ ላይ በመያዝ ለጥናቱ ተቆጣጣሪ ሪፖርት ያድርጉ፡፡
ለማንኛውም አይነት ጥያቄ ዋና አጥኚውን ማነጋገር ይችላሉ፡፡ **የሞባይል ስልክ ቁጥር፡ 09 12 06 62 94**

የተጀመረበት ሰዓት ---------- ያለቀበት ሰዓት ----------
☐መረጃ ሰብሳቢው፡ ስም----------ፊርማ----------ቀን፡----------
የተቆጣጣሪ፡ ስም---------- ፊርማ----------ቀን፡----------

አዲስ አበባ ዩኒቨርስቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና አጠባበቅ የፕረሼንትሽ ሜድስን ትምህርት ክፍል

ከጤና ጋር የተያያዘ የምርምር ወይም ጥናታዊ ጽሁፍ መረጃ ለመሰብሰብ የተዘጋጀ ቃለመጠይቅ

በተማሪ የሚመለስ መጠይቅ

የተሳታፊው መለያ ቁጥር ----------

ጾታ _____

እድሜ _____

የትምህርት ደረጃ _____

የትምህርት ቤቱ አድራሻና ይዞታ			
ተ.ቁ	**ጥያቄ**	**መልስ**	**ኮድ**
1	የትምህርት ቤቱስም		
2	ክፍለ ከተማ		
3	ቀበሌ		
4	የትምህርትቤቱአይነት	1. የመንግስት/የህዝብ/ 2. የግል/ ሚሽን	

ከባህሪጋርየተያያዙ ጥያቄዎች

የአመጋገብልምድ

ከዚህ ቀጥሎ ባለፈው አንድ አመት አዘውትረው ስለተመገቧቸው አትክልትና ፍራፍሬዎችን በተመለከተ እጠይቅዎታለው

ተ.ቁ	**ጥያቄ**	**መልስ**	**ኮድ**
5	አብዛኛውን ጊዜ በአንድ ሳምንት ዉስጥ ስንት ቀን ፍራፍሬዎችን ይመገባሉ?	በሳምንት---------- ቀን ምንም ከሌለ ይሞላ … ወደ ይሂዱ	
6	ፍራፍሬ ከሚመገቡባቸው ቀናት ውስጥ በአንድ ቀን እነዚህን ፍራፍሬዎች በቀን ስንት ጊዜ ይጠቀማሉ?	በቀን ---------ጊዜ	
7	አብዛኛውን ጊዜ በአንድ ሳምንት ውስጥ ስንት ቀን አትክልቶችን ይመገባሉ?	በሳምንት ----------ቀን ምንም ከሌለ ይሞላ… ወደይሂዱ	
8	አትክልት ከሚመገቡባቸው ቀናት ውስጥ በአንዱ ቀን እነዚህን አትክልቶች በቀን ስንት ጊዜ ይጠቀማሉ?	በቀን ---------ጊዜ	

የአመጋገብልምድ

ከዚህ ቀጥሎ በአለፈው አንድ አመት ስለነበርዎት የአመጋገብ ሁኔታ እጠይቅዎታለሁ::

ተ.ቁ	**ጥያቄ**	**መልስ**	**ኮድ**
9	በይበልጥ የሚወዱአቸውን የምግብ አይነቶች ሦስቱን ይጥቀሱ::	ነ. -. 2. -. 3. ----------	
10	በይበልጥ የሚጠለዋቸውን የምግብአይነቶች ሦስቱን ይጥቀሱ::	ነ. -. 2. -. 3. ----------	
11	በቁርስና በምሳ መካከል ወይም በምሳ እና በእራት መካከል ወይም ከመደበኛ አመጋገብ በተጨማሪ ምግብ ይመገባሉ?	ነ. አዎ 2. አይደለም መልሱ አይደለም ከሆነ ወደ ---ይሂዱ	
12	ከላይ ለተጠቀሰው ጥያቄ መልስዎ አዎ ከሆነ የሚጠቀሙት ምግብ ምንድን ነው?	----------	
13	ከላይ የጠቀሱትን ምግብ በቀን ስንት ጊዜ ይጠቀማሉ?	በቀንጊዜ	
14	ከላይ የተጠቀሱትን ምግብ ሳይጨምር በቀን ስንት ጊዜ ይመገባሉ?	በቀንጊዜ	

15	ምሳዎን እንዴት ወይም ከየት ያገኛሉ?	1. ከቤት በማምጣት ወይም ቤት በመሄድ 2. ከትምህርት ቤት ካፍቴሪያ በመግዛት 3. በት/ቤቱ አቅራቢያ ከሚገኝ ምግብ ቤት በመግዛት 4. ምሣ ተጠቅሜ አላዉቅም	
16	ከመደበኛ ምግብ በተጨማሪ ገዝተው የሚጠቀሙዋቸውን የምግብ አይነቶች ካሉ ይጥቀሱ?	1. ኬክ 2. ብስኩት 3. አይስክሪም 4. ቸኮሌት 5. ሌላ ካለ ይጥቀሱ----------	
17	ፊልም ቤት በሚሄዱበት ጊዜ ምግብ ገዝተው ይጠቀማሉ?	1. አዎ 2. የለም 3. ፊልም ቤት አልሄድም	
18	የአንተ/የአንቺ መኝታ/ማደሪያ ክፍል ዉስጥ ቴለቪዥን ወይም ኮምፒዩተር አለ?	1. አዎ 2. የለም	
19	ቴለቪዥን በሚያዩበት ጊዜ ምግብ ይጠቀማሉ ወይም ይመገባሉ?	1. አዎ 2. የለም 3. ቴለቪዥን አላይም	
20	ጥናት በሚያጠኑበት ጊዜ ምግብ ይበላሉ?	1. አዎ 2. የለም	
21	ሁል ጊዜ ቁርስህን/ሽን በአግባቡ (በየቀኑና ሰዓቱን ጠብቀህ/ሽ) ትበላለህ/ትበይያለሽ?	1. አዎ 2. የለም	
22	የምግብ ሰአትሽን /ህን በአግባቡ ያለመጠበቅ ልምድ አለህ/አለሽ?	1. አዎ 2. የለም	

አካላዊእንቅስቃሴ

ከዚህ ቀጥዬ በተለያዩ አካል እንቅስቃሴ በማካሄድ የሚያሳልፋቸውን ጊዜያት በተመለከተ እጠይቅዎታለሁ

ከስራ ጋር የተያያዘ እንቅስቃሴ

ተ.ቁ	ጥያቄ	መልስ	ኮድ
23	ከትምህርትዎ ውጪ ሌላ ስራ ይሰራሉ?	1. አዎ 2. የለም ወደ ----ይሂዱ	
24	ከዚህ በላይ ለተጠቀሰው ጥያቄ መልስዎ አዎ ከሆነ ብርቱ ጉልበት የሚጠይቅ ተግባር ወይም ቶሎ ቶሎ መተንፈስን ወይም ፈጣን የልብ ምት ሊያስከትል የሚችል ተግባር ያለማቋረጥ ቢያንስ ለአስር ደቂቃ ይጠይቃል?	1. አዎ 2. አይደለም መልሱ አይደለም ከሆነ ወደ-----	
25	አብዛኛውን ጊዜ በሳምንት ስንት ቀን ብርቱ ጉልበት የሚጠይቅ ተግባር ያከናውናሉ?	የቀን ብዛት----------	
26	ብርቱ ጉልበት የሚጠይቅ ተግባር ከሚያከናውኑባቸው ቀናት በቀን ለምን ያህል ሰዓት ይሰራሉ?	ሰአት---------- ደቂቃ----------	
27	ስራው መጠነኛ ጉልበት የሚጠይቅ ተግባር ወይም መጠነኛ የልብ ምት ፍጥነት ጭማሪ ሊያስከትል የሚችል ተግባር ያለማቋረጥ ቢያንስ ለ10 ደቂቃ ይጠይቃል?	1. አዎ 2. አይደለም መልሱ አይደለም ከሆነ ----ይሂዱ	
28	አብዛኛውን ጊዜ መጠነኛ ጉልበት የሚጠይቁ ስራዎችን በሳምንት ስንት ቀን ያከናውናሉ?	የቀን ብዛት----------	
29	መጠነኛ ጉልበት የሚጠይቅ ተግባራት ከሚያከናውኑባቸው በአንዱ ቀን ለምን ያህል ሰዓት ይሰራሉ?	ሰአት------- ደቂቃ----------	

ከቦታ ቦታ እንቅስቃሴ

ከዚህ ቀጥሎ ከቦታ ቦታ ሲንቀሳቀሱ በብዛት የሚጠቀሙባቸውን መንገዶች እጠይቅዎታለሁ

ተ.ቁ	ጥያቄ	መልስ	ኮድ
30	ከቦታ ቦታ በሚንቀሳቀሱበት ጊዜ ለ10ደቂቃ ያለማቋረጥ በእግርዎ ወይም በብስክለት ይሄዳሉ?	1. አዎ 2. አይደለም አይደለም ከሆነ ------ይሂዱ	
31	በሳምንቱ ውስጥ ስንት ቀን ከ10 ደቂቃ ያላነሰ በእግርዎ ወይም በብስክለት ይሄዳሉ?	የቀን ብዛት----------	
32	በነዚህ ቀናት ውስጥ በቀን ምን ያህል ሰአት ሳያቋርጡ በእግርዎ ወይም በብስክለት ይሄዳሉ?	ሰአት ---------- ደቂቃ----------	

ከመዝናናት እና ከስፖርት እንቅስቃሴዎች ጋር

ከዚህ ቀጥሎ ከመዝናናት እና ከስፖርት እንቅስቃሴዎችን በተመለከተ እጠይቅዎታለሁ፡፡

ተ.ቁ	ጥያቄ	መልስ	ኮድ
33	ከፍተኛ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያስከትል የሚችል ስፖርት ቢያንስ ለ10 ደቂቃ ያህል ሳያቋርጡ ይሰራሉ?	1. አዎ 2. አይደለም አይደለም ከሆነ -----ይሂዱ	
34	አብዛኛውን ጊዜ በሳምንት ስንት ቀን ከፍተኛ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያስከትል የሚችል የስፖርት ቢያንስ ለ10 ደቂቃ ያህል ሳያቋርጡ ይሰራሉ?	የቀን ብዛት ----------	
35	ስፖርት ከሚሰሩባቸው ቀናት ውስጥ በአንዱ ቀን ሳያቋርጡ ለምን ያህል ቀን ቀን ከፍተኛ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያስከትል የሚችል ስፖርት ሳያቋርጡ ይሰራሉ?	ሰአት -------- ደቂቃ--------	
36	መጠነኛ የሆነ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያስከትል የሚችል የስፖርት ቢያንስ ለ10 ደቂቃ ያህል ሳያቋርጡ ይሰራሉ?	1. አዎ 2. አይደለም አይደለም ከሆነ ------ይሂዱ	
37	አብዛኛውን ጊዜ በሳምንት ስንት ቀን መጠነኛ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያስከትል የሚችል የስፖርት ቢያንስ ለ10 ደቂቃ ያህል ሳያቋርጡይሰራሉ?	የቀን ብዛት----------	
38	ስፖርት በሚሰሩአቸው ቀናት ውስጥ በአንዱ ቀን ሳያቋርጡ ለምን ያህል ሰዓት መጠነኛ የልብ ምት ወይምየአተነፋፈስ ፍጥነት መጨመር ሊያስከትል የሚችል የስፖርት ቢያንስ ለ10 ደቂቃ ያህል ሳያቋርጡ ይሰራሉ?	ሰአት -------- ደቂቃ----------	
39	የመኖሪያ አካባቢህ/ሽ በሚገኙ ስፍራዎች ላይ የመጫወት ልምድ አለህ/ሽ?	1. አዎ 2. አይደለም አይደለም ከሆነ------ይሂዱ	
40	ለጥያቄ 39 መልሱ አይደለም ከሆነ ምክንያቱምንድነው?		

በመቀመጥ ጊዜን የሚያሳልፉበት ሁኔታ

ተ.ቁ	ጥያቄ	መልስ	ኮድ
41	አብዛኛውን ጊዜ በቀን ስንት ፊልም ታያለህ/ታዪለሽ?	..	
42	አብዛኛውን ጊዜ በቀን ምን ያህል ሰዓት ተቀምጠህ/ሽ ተሳልፋለህ/ታሳልፊያለሽ?	ሰአት -------- ደቂቃ----------	

አካላዊ ልኬት

ተ.ቁ	ልኬት	መልስ	ኮድ
43	ቁመት	. ሴንቲ ሜትር	
44	ክብደት	. ኪሎ ግራም	
	ጊዜዎትን ሰጥተዉ ለቃለመጠይቁ ሰለተባበሩን እናመሰግናለን!		

Annex 10: Amharic version of Participant's Consent and Information Sheet

አዲስ አበባ ዩኒቨርስቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና አጠባበቅ የፕረቬንትቭ ሜድስን ትምህርት ክፍል
ከጤና ጋር የተያያዘ የምርምር ወይም ጥናታዊ ጽሁፍ መረጃ ለመሰብሰብ የተዘጋጀ ቃለመጠይቅ

የጥናቱ መግለጫና የፈቃደኝነት መግለጫ ቅፅ

ጤና ይስጥልኝ!

ስሜ ----------ይባላል። እዚህ የመጣሁት በአዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ በህብረተሰብ ጤና የትምህርት ክፍል ፕረቬንትቭ ሜድስን መስክ የዴህረ ምረቃ ተማሪ የሆነውን መድኅን ጌታን ወክዬ ከመጠን ያለፈ ወፍረትና መንስኤዎች ላይ በአንደኛ ደረጃተማሪዎች ላይ ለሚደረገዉ ጥናት ቃለ መጠይቅ ለማድረግ ነው። በቃለ መጠይቁ እንዲሳተፉ የእርስዎን ፈቃደኝነት እጠይቅዎታለሁ፡፡ ለማጠናዉ ጥናት የተወሰኑ ጥያቄዎቸን ስለማህበራዊና ደሞግራፊያዊ ሁኔታ፣ ስለአካላዊ እንቅስቃሴና በመቀመጥ የሚያሳልፉት ጊዜ በተመለከተ እጠይቅዎታለሁ። ከዚህ በተጨማሪ የእርሰዎን ክብደትና ቁመት እለካለሁ። የማገኘዉ መረጃ ከክብደት መጨመር ጋር ተያይዘዉ የሚመጡ የጤና ችግሮች ለመከላከል እቅድ ለማዉጣት ይረዳናል። ከእርሰዎና ከልጅዎ የማገኘዉን መረጃ በምስጢር እጠብቃለሁ። ከእርስዎ የምንሰበስበዉ መረጃ ከእርሰዎም ሆነ ከልጅዎ ስም ጋር አይያያዝም። በዚህ ጥናትዉሰጥ ለመሳተፍ በቅድሚያ የተሳታፊዉን ፈቃደኝነት እንጠይቃለን። መልስ መስጠት የማይፈልጉበት ጥያቄ ካለዎት ለመመለስ አይገደዱም። በዚህ ጥናት ለመሳተፍ ፈቃደኛ ነዎት

1. አዎ
2. አይደለሁም

መልሱ " አይደለሁም " ከሆነ አመስግነው መጠይቁን ያቋርጡ፡፡ ለጥናቱ ፈቃደኛ ያልሆኑበትን ምክንያት በመጠየቅና በማስታወሻዎ ላይ በመያዝ ለጥናቱ ተቆጣጣሪ ሪፖርት ያድርጉ፡፡
ለማንኛውም አይነት ጥያቄ ዋና አጥኚውን ማነጋገር ይችላሉ፡፡ **የሞባይል ስልክ ቁጥር፡ 09 12 06 62 94**

የተጀመረበት ሰዓት ---------- ያለቀበት ሰዓት ----------
መረጃ ሰብሳቢው፡ ስም---------- ፊርማ----------ቀን፡----------
የተቆጣጣሪ፡ ስም---------- ፊርማ----------ቀን፡----------

አዲስ አበባ ዩኒቨርስቲ ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና አጠባበቅ የፕሪቬንትቭ ሜድስን ትምህርት ክፍል

ከጤና ጋር የተያያዘ የምርምር ወይም ጥናታዊ ጽሁፍ መረጃ ለመሰብሰብ የተዘጋጀ ቃለመጠይቅ

በተማሪ ወላጅ የሚመለስ መጠይቅ

<u>ክፍል አንድ</u>፡-ማህበራዊና ዴሞግራፊያዊ ሁኔታ

የተሳታፊው ኮድ/የመጠይቁ መለያ ቁጥር----------

መጠይቁ የተካሄደበት ቀን--------/ ---------/ ---------

የትምህርት ቤቱ ስም----------

አድራሻ	መልስኮድ
ነ ክፍለ ከተማ	_____.
2 ቀበሌ	_____.
3 የሚኖሩበት ሰፈር ልዩ መጠሪያ	_____.
4 የመኖሪያ ቤት መለያ ቁጥር	_____.

ቁ	የማህበራዊና ዴሞግራፊ ሁኔታ ጥያቄ	መልስ	ኮድ
5	እርስዎ (ቃለመጠይቁን የመለሰዉ የቤተሰብ አባል) በጥናቱ ላይ ለተሣተፈዉ ልጅ ምኑ ነዎት?	ነ. እናት 2. አባት	
6	አብዛኛዉን ጊዜ የእርስዎን የቤተሰብ ምግብ ፊጆታን የማቅረብ፣ የማዘጋጀት እና የማብሰል ሀላፊነት የማን ነዉ?	ነ. እናት 2. አባት	
7	የልጅዎ ፆታ	ነ. ወንድ 2. ሴት	
8	**የእናት** ዕድሜ	_____	
9	**የአባት** ዕድሜ	_____	
10	አማካኝየቤተሰብ**የወርዝቢ** ስንትብር ነው? (የአባት እና የእናት ማንኛዉም ዓይነት ወረሃዊ ገቢ ድምር በብር)	_____ብር	
11	**እናት** ያጠናቀቁት ከፍተኛ የትምህርት ደረጃ	ነ. መደበኛ ት/ት ያልተማረ 2. አንደኛ ደረጃ ት/ት የተማረ 3. ሁለተኛ ደረጃ ት/ት 4. ከሁለተኛ ደረጃ ት/ት በላይ	
12	**አባት** ያጠናቀቁት ከፍተኛ የትምህርት ደረጃ	ነ. መደበኛ ት/ት ያልተማረ 2. አንደኛ ደረጃ ት/ት የተማረ 3. ሁለተኛ ደረጃ ት/ት 4. ከሁለተኛ ደረጃ ት/ት በላይ	
13	**የእናት** ዋና መተዳደርያ ሥራ ምንድን ነው?	1. የቤትእመቤት 2. ነጋዴ 3. የመንግስት ሠራተኛ 4. የግል ሥራ 5. የጉልበት/የቀን/ ሠራተኛ 6. ሥራ የሌለው 7. ሌላ (ይጠቀስ).....	

14	**የአባት** ዋና መተዳደርያ ሥራ ምንድን ነው?	1. ገበሬ 2. ነጋዴ 3. የመንግስት ሠራተኛ 4. የግል ሥራ 5. የጉልበት/የቀን/ ሠራተኛ 6. ሥራ የሌለው 7. ሌላ (ይጠቀስ)……	
15	እርስዎን ጨምሮ **የቤተሰብ ብዛት** ስንት ነው?	_____	
16	ቤተሰብ ከቦታ ወደ ቦታ ለመንቀሳቀስ የሚጠቀምበት **የግል አዉቶሞቢል/መኪና** አለዎት?	ነ. አዎ 2. የለም	
17	በእርግዝና ወቅት ከእርግዝና ጋር ተያይዞ የሚመጣ **የስኳርበሽታን** የሚያሳይ የህክምና ውጤት ነበርዎት?	1. አዎ 2. የለም	
	<u>ክፍል ሁለት:የወላጆች ልጆችን የመመገብ አመለካከት፣ ዝንባሌና ልማድ</u> **<u>የወላጆች የሀላፊነትስሜት</u>፡ ልጆችን በመመገብ ዙሪያ** **<u>መመሪያ፣</u>** እባክዎ ለእያንዳንዱ ጥያቄ ከቀረቡት ምርጫዎች ዉስጥ አንዱን፤ እርስዎን በደንብ ይገልጻል ብለዉ ያሰቡትን መልስ የያዘዉን ቁጥር ብቻ መርጠዉ ይክበቡት፡፡		
18	ልጅዎ ቤት በሚሆንበት ጊዜ የእሱን **ምግብ የመስራት ሀላፊነትዎ** ምን ያህል ጊዜ ነዉ?	ነ. በፍጹም (0) 2. አልፎ አልፎ (ነ-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	
19	የልጅዎን **የምግብ መጠን የመወሰን ሀላፊነትዎ** ምን ያህል ጊዜ ነዉ?	ነ. በፍጹም (0) 2. አልፎ አልፎ (ነ-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	
20	ልጅዎ **ትክክለኛ የምግብ ዓይነት በልቶ እንደሆነ የመወሰን ሀላፊነትዎ** ምን ያህል ጊዜ ነዉ?	ነ. በፍጹም (0) 2. አልፎ አልፎ (ነ-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	
	<u>በወላጆች እይታ</u>፡ የልጆች የሰዉነት ክብደት		
21	**የልጅዎ አሁን ያለዉን የክብደት** ሁኔታ በእርስዎ እይታ ወይም በተረዱበት አገላለጽ ምን ይመስላል?	ነ. በጣም ዝቅተኛ ክብደት 2. ዝቅተኛ ክብደት 3. ትክክለኛ ክብደት 4. ከፍተኛ ክብደት 5. በጣም ከፍተኛ ክብደት	
	<u>የወላጆች ስጋት</u>፡ <u>ስለልጆች ከመጠን በላይ ክብደት መጨመር ላይ</u>		
22	እርስዎ ከልጅዎ አጠገቡ በሌሉበት ጊዜ **የልጅዎ ከመጠንበላይ** ወይም ብዙ መመገብ ስጋት ምን ያህል ያሳስብዎታል?	1. አያሳስበኝም 2. በትንሹ ያሳስበኛል 3. ያሳስበኛል 4. በመጠኑያሳስበኛል 5. በጣምያሳስበኛል	
23	**ልጅዎ ለዕድሜዉ የሚመጥን የሰዉነት ክብደት** ለመጠበቅ የሚያስችል ምግብ ስለመዉሰዱ ወይም ልጅዎ ከመጠን በላይ ክብደት የመጨመሩ ስጋት ምን ያህል ያሳስብዎታል?	1. አያሳስበኝም 2. በትንሹ ያሳስበኛል 3. ያሳስበኛል 4. በመጠኑያሳስበኛል 5. በጣምያሳስበኛል	

	<u>የወላጆች ክትትል</u>፡ በልጆች አመጋገብ ላይ		
24	የልጅዎን **የጣፋጭ ነገሮች** (እንደ ከረሜላ፣ አይስ ክሬም፣ ኬክ፣ ኩክስ፣ ብስኩት) አመጋገብ ወይም አወሳሰድ ሁኔታ ትኩረት ሰጥተዉ ምን ያህል ጊዜ ይከታተላሉ?	1. በፍጹም (0) 2. አልፎ አልፎ (1-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	
25	የልጅዎን **የከፍተኛ ቅባት (የተጠበሱ) ምግቦች** አወሳሰድ ትኩረት ሰጥተዉ ምን ያህል ጊዜ ይከታተላሉ?	1. በፍጹም (0) 2. አልፎ አልፎ (1-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	
26	የልጅዎን **የለስላሳ መጠጦች** አወሳሰድ ትኩረት ሰጥተዉ ምን ያህል ጊዜ ይከታተላሉ?	1. በፍጹም (0) 2. አልፎ አልፎ (1-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	
27	ልጅዎ የሚመገበዉን **የፍራፍሬና አትክልት** መጠን ምን ያህል ጊዜ በትኩረት ይከታተላሉ?	1. በፍጹም (0) 2. አልፎ አልፎ (1-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	
28	እርስዎም ሆነ ሌላ የቤተሰብ አባል ልጅዎ ቁጭ ብሎ **ቴሌቭዝን** ወይም ቪዲዮን እየተመለከተ የሚያሳልፈዉን ጊዜ መጠን ምን ያህል በትኩረት ይከታተላሉ?	1. በፍጹም (0) 2. አልፎ አልፎ (1-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	
29	እርስዎም ሆነ ሌላ የቤተሰብ አባል ልጅዎ በቂ **ስፖርት** መስራቱን ወይም አካላዊ እንቅስቃሴ ላይ መሳተፉን ምን ያህል ይከታተላሉ?	1. በፍጹም (0) 2. አልፎ አልፎ (1-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	
	<u>ክፍል ሦስት</u>፡ ከአመጋገብና ከእንቅስቃሴ ጋር የተያያዘ የቤተሰብ ገጽታ <u>ጤናማ ምግቦች ፣ጤናማ ያልሆኑ ምግቦች፣ የለስላሳ መጠጦችና ከአካል እንቅስቃሴ ጋር ተያያዥ ዕቃዎች **አቅርቦት**</u>		
30	ባለፉት ሰባት ቀናት ዉስጥ **ፍራፍሬ** በቤትዎ ዉስጥ የተገኘዉ ወይም በቤትዎ ገበታ ላይ የቀረበዉ ምን ያህል ጊዜ ነዉ?	1. በፍፁም (0) 2. አልፎ አልፎ (1 – 2) 3. አንዳንድ ጊዜ (3 – 4) 4. ሁልጊዜ (5 – 7)	
31	ባለፉት ሰባት ቀናት ዉስጥ **አትክልት** በቤትዎ ዉስጥ የተገኘዉ ወይም በቤትዎ ገበታ ላይ የቀረበዉ ምን ያህል ጊዜ ነዉ?	1. በፍፁም (0) 2. አልፎ አልፎ (1 – 2) 3. አንዳንድ ጊዜ (3 – 4) 4. ሁልጊዜ (5 – 7)	
32	ባለፉት ሰባት ቀናት ዉስጥ **ለስላሳና** ሌሎች ከስኳር ጋር የተሰራ **ጣፋጭ መጠጥ** በቤትዎ ዉስጥ የተገኘዉ ወይም በቤትዎ ገበታ ላይ የቀረበዉ ምን ያህል ጊዜ ነዉ?	1. በፍፁም (0) 2. አልፎ አልፎ (1 – 2) 3. አንዳንድ ጊዜ (3 – 4) 4. ሁልጊዜ (5 – 7)	
33	ባለፉት ሰባት ቀናት ዉስጥ **ጣፋጭ ምግቦች** (ከሬሜላ፣ ቼኮሌት፣ ኬክ) በቤትዎ ዉስጥ የተገኘዉ ምን ያህል ጊዜ ነዉ?	1. በፍፁም (0) 2. አልፎ አልፎ (1 – 2) 3. አንዳንድ ጊዜ (3 – 4) 4. ሁልጊዜ (5 – 7)	
34	ባለፉት ሰባት ቀናት ዉስጥ**የተጠበሰ ምግብ** (የተጠበሰ ሥጋ፣የተጠበሰ አትክልት፣ የተጠበሰ ዓሣ) በቤትዎ ዉስጥ የተገኘዉ ወይም ገበታ ላይ የቀረበዉ ምን ያህል ጊዜ ነዉ?	1. በፍፁም (0) 2. አልፎ አልፎ (1 – 2) 3. አንዳንድ ጊዜ (3 – 4) 4. ሁልጊዜ (5 – 7)	

35	እባክዎ ከዚህ በታች ከተዘረዘሩት መካከል በቤትዎ ወይም በግቢዎ ለልጆች **ስፖርትመሥሪያ**ነት የተዘጋጀ ካለ ይጠቁሙ ሀ. የጅምናዚየም ዕቃዎች(ብስክለት ባለበት የሚነዳ፣ የመሮጫ ማሽን ወዘተ.)_ ለ. ብስክለት ተነድቶ የሚሄድ__ ሐ. ክብደት ማንሳትን መለማመጃዎች _ መ. በቪድዮ የተዘጋጀ የስፖርት መሥሪያ __ ሠ. የስፖርት ዕቃዎች (ኳስ፣ የጠረጴዛ ኳስ፣ የዝላይ ገመድ፣ ወዘተ.)__ ረ. የዮጋ ስፖርት መሥሪያ ቦታና ዕቃዎች ___	1. አዎ 2. የለም	
36	እባክዎ ከዚህ በታች ከተዘረዘሩት መካከል በቤትዎ/በግቢዎ ያሉትን ይጠቁሙ ሀ. የሳታላይት ዲሽ **ቴሌቪዥን**___ ለ. የቪዲዮ/ የዲቪዲ ማጫወቻ ___ ሐ. ፕላይ ስቴሽን (ጌም መጫዎቻ) ___ መ. ኮምፕዩተር __ ሠ. ኢንተርኔት ___	1. አዎ 2. የለም	
37	በአጠቃላይ በቤትዎ ዉስጥ ስንት **ቴሌቪዥን** አለ?	1. ምንም 2. አንድ 3. ሁለት ወይም ከዚያ በላይ	
	<u>የቤተሰብ ገቢታ (አብሮ የመብላት ልምድ)</u>		
38	ባለፈዉ ሳምንት (በ 7 ቀናት) ሁሉም ወይም አብዛኛዉ የቤተሰብ አባል **በአንድ ገቢታ ላይ** ሁነዉ የተመገቡት ስንት ጊዜ ነዉ?	1. ምንም 2. አንድ ጊዜ 3. ሁለት ጊዜ 4. ሦስት ጊዜ 5. አራት ጊዜ 6. አምስት ጊዜ 7. ስድስት ጊዜ 8. ሰባት ጊዜ 9. ከሰባት ጊዜ በላይ	
	<u>የወላጆች አርአያነት</u>		
39	አንድ ሳምንት ወደኋላ ያስታዉሱና ባለፉት ሰባት ቀናት ዉስጥ **ለስላሳ** መጠጦችን ምን ያህል ጊዜ ተጠቀሙ?	1. ምንም 2. አንድ ጊዜ 3. ሁለት ጊዜ 4. ሦስት ጊዜ 5. አራት ጊዜ 6. አምስት ወይም ከዚያ በላይ	
40	አንድ ሳምንት ወደኋላ ያስታዉሱና ባለፈዉ ሳምንት ዉስጥ **ፍራፍሬ** ምን ያህል ጊዜ ተመገቡ?	1. ምንም 2. አንድ ጊዜ 3. ሁለት ጊዜ 4. ሦስት ጊዜ 5. አራት ጊዜ 6. አምስት ወይም ከዚያ በላይ	
41	አንድ ሳምንት ወደኋላ ያስታዉሱና ባለፈዉ ሳምንት ዉስጥ **አትክልት**ን ምን ያህል ጊዜ ተመገቡ?	1. ምንም 2. አንድ ጊዜ 3. ሁለት ጊዜ 4. ሦስት ጊዜ 5. አራት ጊዜ 6. አምስት ወይም ከዚያ በላይ	
42	ባለፈዉ ሳምንት (7 ቀናት) ዉስጥ **ብርቱ ጉልበት** የሚጠይቅ ተግባር ወይም ቶሎ ቶሎ መተንፈስን ወይም ፈጣን የልብ ምት ሊያስከትል የሚችል ተግባር (ለምሳሌ፡- ብስክሌት በፍጥነት መንዳት፣ በሙዚቃ የታጀበ የሰዉነት ማሳልመሻ እንቅስቃሴ፣ በፍጥነት መሮጥ፣ የዉሃ ዋና፣ቴኒስ፣ የእግር ኳስ፣ የቅርጫት ኳስ) እያከናወኑ ምን ያህል ሰዓት ያሳልፋሉ?	1. የለም 2. ለአንድ ሰዓት 3. ለሁለት ሰዓታት 4. ለሦስት ሰዓታት 5. ለአራት ሰዓታት 6. ለአምስት ሰዓታት 7. ለስድስት ሰዓታት 8. ለሰባትና ከዚያ በላይ	

43	ባለፈዉ ሳምንት (7 ቀናት) ዉስጥ **መጠነኛ ጉልበት** የሚጠይቅ ወይም ብዙ የማያደክም ተግባር ወይም መጠነኛ የልብ ምት ፍጥነት ጭማሪ ሊያስከትል የሚችል ተግባር (ለምሳሌ፡- በፍጥነት መራመድ፣ መጨፈር፣ ጂምናስቲክ፣ ብስክለት ቀስ ብሎ መንዳት፣ የመረብ ኳስ፣ የአካል ብቃት ስልጠና) እያከናወኑ ምን ያህል ሰዓት ያሳልፋሉ?	ነ. የለም 2. ለአንድ ሰዓት 3. ለሁለት ሰዓት 4. ለሦስት ሰዓት 5. ለአራት ሰዓት 6. ለአምስት ሰዓት 7. ለስድስት ሰዓት 8. ለሰባትና ከዚያ በላይ ሰዓት	
44	ባለፈዉ ሳምንት (7 ቀናት) ዉስጥ **ተመጣጣኝ ጉልበት** ወይም ትንሽ ጥረት የሚጠይቅ ተግባር (ለምሳሌ፡- ቀስ ብሎ መራመድ፣ ዮጋ ፣ የጡንቻ ማፍታታት፣ የሚያሰለች የቤት ዉስጥ ሥራ) እያከናወኑ ምን ያህል ሰዓት ያሳልፋሉ?	ነ. የለም 2. ለአንድ ሰዓት 3. ለሁለት ሰዓት 4. ለሦስት ሰዓት 5. ለአራት ሰዓት 6. ለአምስት ሰዓት 7. ለስድስት ሰዓት 8. ለሰባትና ከዚያ በላይ ሰዓት	
45	በሳምንት ቀናት (**ከሰኞ** እስከ **ዓርብ** ባሉት) ዉስጥ **ቴሌቪዥን** ወይም **ቪዲዮ** በማየት ምን ያህል ሰዓት ያሳልፋሉ?	ነ. ምንም 2. ለአንድ ሰዓት 3. ለሁለት ሰዓት 4. ለሦስት ሰዓት 5. ለአራት ሰዓት 6. ለአምስት ሰዓት 7. ለአምስትና ከዚያ በላይ	
46	በሳምንት የዕረፍት ቀናት (**ቅዳሜ** እና **እሁድ**) ዉስጥ **ቴሌቪዥን** ወይም **ቪዲዮ** በማየት ምን ያህል ሰዓት ያሳልፋሉ?	ነ. ምንም 2. ለአንድ ሰዓት 3. ለሁለት ሰዓት 4. ለሦስት ሰዓት 5. ለአራት ሰዓት 6. ለአምስት ሰዓት 7. ለአምስትና ከዚያ በላይ	
	የወላጆች ድጋፍ ወይም ማበረታታት		
47	በሳምንት ዉስጥ እርስዎም ሆነ ሌላ የቤተሰብ አባል ልጅዎ **ጤናማ ምግብ** እንዲመገብ፣**ስፖርት** እንዲሰራ ወይም እንዲጫወት እናቁጭ ብሎ **ቴሌቭዥን** ወይም **ቪዲዮን** እየተመለከተ የሚያሳልፈዉን ጊዜ መጠን እንዲቀንስ ምን ያህል ጊዜ ያበረታታሉ?	ነ. በፍጹም (0) 2. አልፎ አልፎ (ነ-2) 3. አንዳንድ ጊዜ (3-4) 4. አብዛኛዉን ጊዜ (5-6) 5. ሁልጊዜ (6 በላይ)	

አካላዊ ልኬት

ተ.ቁ	ልኬት	መልስ	ኮድ
48	የእናት ክብደት የእናት ቁመት	_____._በኪሎ ግራም _____በሴንቲ ሜትር	
49	የአባት ክብደት የአባት ቁመት	_____._በኪሎ ግራም _____በሴንቲ ሜትር	
	ጊዜዎትን ሰጥተዉ ሊቃለመጠይቁ ሰለተባበሩን እናመሰግናለን!		

CurriculumVita

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- Candidate for the Degree ofMaster of Public Health

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_ Candidate for the Degree of Master of Public Health in Epidemiology and Biostatistics at Addis Ababa University, School of public health, Addis Ababa, 2016.

_Completed the requirements for the Bachelor of Science in public health officer at Hawassa University, Hawassa in 2013

_Completed the requirements for the Bachelor of Art in management at Harumaya University, Harumaya in, 2015

Short term Training

_Attended several short term training programs in different areas

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Personal data

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Education

Long Term

- B.Sc. Statistics (with economics): Addis AbabaUniversity, 1986
- M.Sc. Biometry/Biostatistics : University of Reading, UK, 1992
- PhD. Biometry/Biostatistics: University of KwaZulu-Natal, South Africa, 2006

Short term Training

- Attended several short term training programs in different countries in different areas

Professional experience

Past Employment: Worked for several National and International Institutions, government and non-government, Including EIAR (Ethiopia), CIMMY (Addis Ababa and Zimbabwe), IITA (Nigeria), Tulane University (Ethiopia).

Served as Director of research at EIAR, head of Head of Epidemiology and Biostatistics Department at Tulane, Scientist at CIMMY, Head of Statistics unit at IITA,

Teaching: Thought various courses at different universities. I have though in almost all older universities and few new ones. I provided training program for staff members of five universities at different times.

Consultancies and Projects: Participated in several consultancy activities for different. Worked and working in projects between university and donor agencies.

Current Position: Associate Professor, School of Public Health, CHS, AAU

Publications: Published more than 20 publications in peer reviewed journals; published several other types of publications, ranging from manuals to reports; edited international proceeding.