PREVALENCE OF OVER NUTRATION AND ASSOCITED FACTORS AMONG PRIVATE PRIMARY SCHOOL CHILDREN IN BOLE SUB CITY, ADDIS ABABA, ETHIOPIA

BY

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DECLARATION

This thesis is my original work and has not been presented for a degree of master in any other University and that all the sources and materials used for the thesis have been properly acknowledged.

Declared By: Brhan Asefa Tikue

Signature: _____

Date: _____

Place: Addis Ababa University, College of Development Studies, Center for Food Security Studies, Addis Ababa

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge as an advisor.

Dr. **Aweke Kebede**

_____ _____

(Advisor) Signature Date

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

This is to certify that the thesis prepared by Brhan Asefa Tikue entitled *'prevalence of over nutrition and associated factors among private primary school children in Bole sub city, Addis Ababa, Ethiopia'* and submitted in partial fulfillment of the requirements for the Degree of Master of Science in Food Security and Development complies with the regulations of Addis Ababa University and meets the accepted standards with respect to originality and quality.

Signed by the examining committee:

External Examiner: _____Signature _____ Date _____

Internal Examiner: _____Signature _____ Date _____

Advisor: _____Signature _____ Date_____

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Chairperson of the Center or Graduate Program Coordinator

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ABBREVIATION AND ACRONYMS

AOR:	Adjusted Odds Ratio
BMI:	Body Mass Index
CDC:	Communicable Diseases Control
CI:	Confidence Interval
COR:	Crude Odds Ratio
CSA:	Central Statistical Agency
EDHS:	Ethiopian Demographic and Health Survey
IDDS:	Individual Dietary Diversity Score
IOTF:	International Obesity Task Force
ETB:	Ethiopian Birr
Kg:	Kilogram
MS:	Meter Square
OR:	Odds Ratio
SD:	Standard Deviation
SPSS:	Statistical Package for Social Sciences
PPS:	Proportion to Population Size
TV:	Television
UNICF:	United Nation International Children's Fund
WHO:	World Health Organization

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

Overweight and obesity are excessive fat accumulation in the body which can entail severe implication on people's health. Obesity imposes unacceptably high health problem and economic and social costs on countries at all income level. Obesity represent a severe public health problem, mainly due to the global trend towards increased prevalence rates and the impact they cause in society .In Ethiopia, higher prevalence of overweight and obesity were observed in the Addis Ababa. There for the objective of the study is to assess the prevalence of overweight and associated factors among primary school Children School based cross sectional study was conducted among a random sample of 300 first cycle primary school students. Body mass index was used for determining nutritional status. Descriptive statistics, bivariant analysis and multivariable logistic regression analyses were employed to see factors associated with over nutrition. The study revealed that 39.1% [95%CL= (34.4-44.6) of school age children were overweight. History of parental Obesity, where the families encourage their children to do physical exercise food preference of highly carbohydrate and Time allowed by parents to watch TV /video games were significantly at (P<0.05) associated with over nutrition in first cycle primary school age (6-11) years old students in Bole sub city Addis Ababa Ethiopia. Therefore, interventions need to focus on attitudinal and behavioral change towards child feeding and should target children, families and teachers to overcome the ever increasing problem of overweight in school age children are recommendable.

Keywords: *Overweight, Associated Factors, Primary School Children, Body Mass Index.*

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

Over nutrition is excessive fat accumulations in the body which can entail sever implication on people's heath. It usually refers to overweight and obesity. Obesity can be defined as a condition of abnormal or excessive fat accumulation in adipose tissue to the extent that health may be impaired and also it is the result of people responding normally to the obesogenic (factors that can cause over nutrition) environments they find themselves in. Worldwide obesity has more than doubled since 1980. Both overweight and obesity represent a severe public *health* problem, mainly due to the global trend towards increased prevalence rates and the impact they cause in society (WHO, 2015). Over nutrition is the fifth leading risks for global deaths and it is the major contributor to the leading killer diseases worldwide, including diabetes, heart disease, and some cancers.

The fundamental cause of obesity and overweight is an energy imbalance between calorie intake and expenditure. Globally there has been an increased intake of energy-dense foods that are high in fat, salt and sugars but low in vitamins, minerals and other micronutrients and decrease in physical activity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization (Emana *et al*., 2014).

Globalization, improving economic conditions and changing dietary habits in developing countries are reported as responsible for the rapid increase in obesity. This increase is associated with a lack of supportive policies in sectors such as health, agriculture, transport, urban planning, environment, food processing, distribution, marketing and education. Presently, it is estimated that more than 30 million overweight children live in developing countries and 10 million in developed countries (WHO, 2015; Pienaar, 2015).

Obesity and overweight are serious, chronic diseases that can cause substantial harm to a person's health. Overweight and obesity are not the same; rather, they are different points on a continuum of weight ranging from being underweight to being (morbidly) obese. The percentage of people who fit into these two categories, overweight and obese, is determined by body mass

index (BMI) (Al- Junaibi *et al.,* 2013). Overweight or obese children are more likely to become overweight adults and to suffer premature ill health and mortality.

Overweight and obesity are major public health challenges to the developing nations causing morbidities and mortalities. Besides, overweight and obesity are causing the health care costs to be substantial. Reports show, the disability adjusted life year due to overweight and/or obesity per 1000 population in the year 2010 in the world, developed regions, developing regions, Africa and Eastern Africa was 44, 25, 19 and 24, respectively (FAO, 2013). Virtually, all age groups and socioeconomic classes of the population are affected by the consequences of overweight and obesity. Children are one of vulnerable groups to overweight and obesity that could result in premature deaths and disabilities in adulthood. In addition to future risks, obese children experience breathing difficulties, increased risk of fractures, hypertension, and early markers of cardiovascular disease unless drastic measures are taken to mitigate this burgeoning problem.

In Africa, despite a high prevalence of under nutrition, the prevalence of overweight is increasing at an alarming rate. The prevalence of overweight and obesity is also rapidly increasing among children. The International Obesity Task Force (IOTF) estimates that about 155 million school-going children globally are either overweight or obese (Lobstein *et al*., 2004). WHO defines children as those age group less than 18 adolescents as those in the age group of 10-19. Childhood obesity is considered to be a precursor of adverse health effects in adulthood, as overweight children are more likely to become overweight adolescents and adults; 2.8 times more likely in one study in Chinese children (Popkin *et al.,* 2000).

Low and middle income countries are now facing a double burden of nutritional problems, while they are continuing to deal with under nutrition and are also experiencing a rapid upsurge of non-communicable disease risk factors such as obesity and overweight. It is now common to find under nutrition and obesity existing side-by-side within the same country, the same community, and the same household. Children in low and middle income countries are vulnerable inadequate nutrition; at the same time, they are exposed to high fat, sugar, salt, energy dense, micronutrient-poor foods, which tend to be lower in cost, but also lower in nutrient quality. These dietary patterns in conjunction with lower levels of physical activity result in sharp increase in childhood obesity while under nutrition issues remain unsolved.

Even though there is no well-documented information recently chronic diseases become increasing in Ethiopia, especially in urban areas. In Addis Ababa it becomes common to see overweight people in all age group including school children. Children who are overweight or obese often grow up to be obese as adults (Serdula *et al*., 1993; Guo *et al.*, 2002). Recently there is a growing pattern of childhood overweight in Ethiopia.

1.2. Statement of the problem

The highest prevalence rates of childhood overweight (25.7%) have been observed in developed countries. However, its magnitude is increasing in developing countries (Badawi *et al*., 2013; Niehues *et al*., 2014). Around 10 % of children are overweight, and about 30-45 million children are classified as obese, which accounts for 2-3% of the world's children and adolescents, and 22 million children under 5 years of age being overweight across the world (,Story, Kaphingst, Karen and French, 2006; IOTF, 2005).

Severely obese individuals are three times more likely to require social care than those with a normal weight, resulting in increased risk of hospitalization and associated health and social care costs. WHO declared the double burden of diseases are public health problems in developed and developing countries. Few studies conducted in Ethiopia, they revealed that childhood overweight and obesity are emerging and consistently increasing in magnitude particularly in private school children.

In this connection, the study conducted in Addis Ababa in 2007 including the government and primary school children in ten sub-city showed that prevalence of overweight and obesity among primary school children in Addis Ababa were 7.6 % and 0.9%, respectively (Gebremichael, 2015). In this study also children those enrolled in private school were 6.8 times exposed for overweight and obesity than those who were enrolled in government school. So, the prevalence of overweight and obesity were high in private primary school children whose lifestyle in all dimension were better. In addition to this the previous research has been taken small size to determine the prevalence of overweight and obesity in Bole sub-city primary school children which might not represent the actual prevalence in the study area.

Despite the highest magnitude of the problems observed in developing countries, efforts which were expected to be done so far on obesity and overweight and their associated factors at childhood period in particular and in all developmental stages in general at country level is very much limited. Even though there is no well-documented information recently, chronic diseases become increasing in Ethiopia especially in urban areas. In Addis Ababa it becomes common to See overweight people in all age group including school children. In my experience I saw a lot of obese people in Addis Ababa and some urban parts of Ethiopia like Nazerate and Hawassa.

There is only few documented study done to assess prevalence and determinants of childhood and adolescent overweight and obesity in Addis Ababa. In the past only few studies have been conducted nationally in addition to Ethiopian Demographic and Health Surveys (EDHS). These studies are not comprehensive in addressing all age groups. For example, (EDHL, 2016) report showed that only 15 to 59 years of female and 15 to 59 years men are included in the study and 8% women and 3% men overweight or obese and also the prevalence of overweight Children remained low at 1%. So Limited number of research in this area motivated me to select this topic and also this study covered the age groups from (6-11) years old which were not addressed in the former study. Even though, there is a lack of data concerning overweight and obesity assessment in childhood in Ethiopia, clearly the risk of childhood obesity leading to adult morbidity is of great public health significance.

Due to the above reason this study was designed to measure the prevalence of childhood over nutrition and effect of socio-demographic and life style factors on childhood overweight to stimulate planners and researchers on double burden of disease in Ethiopia which is less recognized problem. As a result this study had great contribution on designing preventive action of early age overweight and obesity.

1.3. Objective of the study

1.3.1General objective

The override objective of this study was to assess the prevalence of overweight and associated factors among private first cycle primary school children in Addis Ababa, Bole sub city, 2017/18.

1.3.2. Specific Objectives

More specifically, the study aspired to:

- assess prevalence of over nutrition among private primary school children (6-11)years old .
- identify factors associated with overweight among private primary school children.

1.4. Research question

1. What does the prevalence of over nutrition look like among children between the ages of 6-11 years old?

2. What are the intended factors makes children over nourished?

1.5. Significant of the study

The findings of this study will be an important step to trigger local public health planners to design appropriate interventions that will effectively address over nutrition among school children. In addition, this research will enable different stakeholders working in the country and the region to unite in common, design and develop locally appropriate plans and implementation strategies early to tackle the double burden of disease in Ethiopia. Furthermore, the school teachers and parents may be able to encourage the students to be conscious of their nutritional status and activity level after they know the result of this study, so that they can maintain healthy weight. Finally, this research will inspire other researchers who plan to conduct research in similar areas especially among primary school children. The finding of this study may therefore be used as a baseline data for those who are interested in carrying out further research.

1.6. Scope and Limitation of the Study

The study has limited scope only in Bole sub city. The study area was selected purposively. The study considers only privet primary schools. Since the study is cross-sectional it may not be strong to demonstrate direct cause and effect relationship between risk factors and outcome. During interview there was social desirability bias by participants. Some parents may under reported income with miss justification of the objective of the study; they may fear taxation

increments following their report. In this study other factors which can affect excess body weight like genetic factor and health condition of participants was not addressed. Skin fold measurement, which might eliminate limitation of BMI measurement, was also not done in this study.

1.7. Organization of the paper

This thesis has five chapters. The first chapter deals with the background of the study and defines the problem of the study, basic hypothesis and objectives of the study, the scope and limitation of the study and the significance of the study. The second chapter includes definition of terms, empirical literature review and conceptual framework. The third chapter deals with study area description, research design and approach, source of population and study population, data sources, sample size determination, sampling technique and procedures, data collection instruments procedures used data processing and method of data analysis, as well as hypothesis and definition of variables and diagnostic test are dealt. The fourth chapter resents results, Discussions, and the fifth chapter of this paper deals with conclusions and recommendations.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1. Magnitude of over nutrition among school children

Obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy. The last two decades of previous century have witnessed dramatic increase in health care cost due to obesity and related issues among children and adolescents (Swati *et al.,* 2015). Based on CDC (2011) report risk of overweight and obesity are the terms preferred to children and adolescents whose excess body weight could pose medical risks. Also committee of nutrition (2003) reported an excessive rate of weight gain at any age relative to linear growth should be recognized, and underlying predisposing factors should be addressed with parents and other caregivers.

Body mass index (BMI) is a measure of weight adjusted for height, calculated as weight in kilograms divided by the square of height in meters (kg/m^2). It is used as a measure to track weight status in populations and as a screening tool to identify potential weight problems in individuals. Furthermore, studies have shown that BMI levels correlate with body fat and with future health risks. For children and adolescents between 5 and 19 years old, BMI is interpreted relative to a child's age and sex, because the amount of body fat changes with age and varies by sex. According to the WHO cut-off points; overweight was considered to be >+1SD, Obesity :> +2SD, Thinness: <-2SD and <-3SD severe thinness (WHO, 2007).

Based on WHO estimation by 2005, at least 1.6 billion and 400 million people aged above 15 years were overweight and obese respectively. It further projected that by 2015, these statistics will increase to 2.3 billion for overweight and 700 million for obesity, unless drastic measures are taken to mitigate this burgeoning problem (Freedman *et al.*, 2009). The prevalence of excess weight among children is increasing in both developed and developing countries, but at very different speeds and in different patterns (Dalal *et al*., 2011). Worldwide, over 22million children under the age of 5 years are severely overweight, 155 million children of school age. This implies that one in 10 children worldwide is overweight. This global average reflects a wide range of prevalence level (De Onis *et al*., 2010).

It is estimated globally 10% of school age children aged 5-17 years were overweight, out of which 2-3% were obese. Using International Obesity Task Force (IOTF) estimates, one out of ten school-age children in the world is overweight or obese. In actual numbers the estimate suggested some 150-160 million school age children were overweight, of which some 30-40 million were obese (Kosti and Panagiotakos, 2006). The prevalence overweight in different region varies with below 5% in Africa and above 20% in Europe (Wang and Lobestin, 2006). Based on WHO estimation by 2005, 1.6 billion and 400 million people age above 15 years were overweight and obese, respectively .It further projected that by 2015, these statistics will increase to 2.3 billion for overweight and 700 million for obesity, unless drastic measures are taken to mitigate this burgeoning problem (Freedman *et al*., 2009).

In United States in the last three decades, the prevalence of overweight and obesity has increased dramatically in both children and adults. In the 1970s, about 15 percent of adults were obese; by 2004, the rate had climbed to 32 percent. (Ogden *et al*., 2006). An estimated 16.9% of children and adolescents aged 2–19 years are obese. In actual numbers among children and adolescents aged 2–19 years, more than 5 million girls and approximately 7 million boys were obese. The prevalence of obesity increased from 5% to 12.1% among preschool children aged 2–5 years between 1976-1980 and 2009-2010. It increased from 6.5% to 18.0% among those aged 6–11 years, from 5% to 18.4% among adolescents aged 12-19 years during the same period (Ogden *et al*., 2012).

In Africa, despite a high prevalence of under nutrition, the prevalence of over nutrition is increasing at an alarming rate. A study conducted by Ene-Obong *et al*. (2012) in Nigeria identified overweight, obesity and thinness prevalence of 11.4%, 2.8% and 13.0% among children aged 5 to 18 years. Similar study by Mogre *et al*. (2013) in Tamale the capital city of the Northern region of Ghana reported the prevalence rates of 29.8% and 17.4% for thinness and overweight/obesity among school age children of 5-14 years. [A cross-sectional comparison study among school children of in Dodoma and Kinondoni municipalities in Tanzania determined the prevalence of overweight and obesity [5.8 and 6.4%, respectively] for children aged 6–9 years and 4.9 and 5.4%, respectively for children aged 10– 12 years (Mosha and Fungo, 2010). A cross-sectional study by Caleyachetty *et al*. (2012) on urban and rural primary school children aged 9–10 years in Mauritius showed 17.4% overweight, 5.0% obese and 12.7%

per cent thinness. Further, a cross-sectional study done in private and public school children in Kenya in a total number of 5325 people, out of the 1,479 pupils in private schools 103 (6.9%) were obese while 245 (16.7%) were overweight. On the other hand, out of the 3,846 pupils in public schools 62 (1.6%) were obese, while 220 (5.7%) were overweight. Among the 2,620 male subjects, 170 (6.5%) were overweight while 67 (2.6%) of them were obese. The results also showed that out of the total 2,760 female pupils, 295 (10.9%) were overweight while 98 (3.6%) were obese (Kamau, 2011).

In Ethiopia, though it is unpublished one study conducted in Addis Ababa in 2007 reported that the prevalence of overweight and obesity among elementary school students were 7.6%and 0.9% respectively. The prevalence of overweight and obesity for private schools were 23.1% and 6.3% respectively (Zeleke, 2007). Other study done by Askal *et al.* (2015*)* in Bole sub city of Addis Ababa among primary schools children showed 9.8% overweight and/or obesity using BMI for age and sex classification among which over weight accounted 8% and obesity accounted for the rest 1.8%. It was higher in females 6.4% (5.2% overweight and 1.2% obese) than male's 3.4% (2.8% overweight and 0.6% obese) students. The overall prevalence rate of overweight and/ or obesity was also higher among private school children 8.1% (6.4% overweight and 1.7% obese) than government school children 1.7% (1.6% overweight and 0.1% obese). This Prevalence rate among private school children alone when calculated separately was 16% and among government school children alone was 3.4%.

A study done by Tesfalem (2012) among 559 secondary school students aged 10 to 19 years old showed that the prevalence of overweight in the study participants was 12.9% and the prevalence of obesity was 2.7%.

2.2. Determinants of over nutrition among school children

Obesity is the result of people responding normally to the obesogenic(factors that can cause over nutrition) environments they find themselves in. Globally, there has been an increased intake of energy-dense foods that are high in fat, salt and sugars but low in vitamins, minerals and other micronutrients; and a decrease in physical activity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization (WHO, 2013). Economic growth, modernization, urbanization and globalization of food markets are just

some of the forces thought to underlie the epidemic (WHO, 2006). The cause of overweight and obesity is suspected to the complex interaction of genetic, environmental and behavioral factors (Hanley, 2000)

2.2.1. Food choices and sedentary activity

Dietary intake and physical activity are the cornerstones of weight management across the life cycle and these factors play an important role in influencing the likelihood of being overweight during childhood and adolescence. The factors in the outer layers affect those in the inner layers, socioeconomic states might influence the types of food available in the home which can influence dietary intake of children or crime rates and neighborhood safety might directly affect the preparedness of parents to allow their children to partake in discretionary physical activity outdoors (Robert, 2010).

Cross-sectional study by Jong *et al*. (2013) among children aged 4–13 years in the city of Zwolle, Netherland showed children aged 4–8 years viewing televise more than 1:50 hr a day were 1.65 (95% confidence interval: 1.15–2.38 times more often overweight compared with 4- to 8-year-old children watching televise <1:00 hr per day. They also reported having >2 televises in the household odds ratio 2.38; 95% confidence interval: 1.66–3.41), televise in the child's bedroom and not having rules on televise viewing as a determinant of televise viewing.

A study by Matthews *et al*. (2011) to investigate the association between the risk of overweight and the consumption of food groups among children and adolescents in Southern California indicated the regular intake of specific plant foods may prevent overweight among children and adolescents. The frequency of consumption of grains, nuts, vegetables and low nutrient density foods were inversely related to the risk of being overweight, whereas dairy intake increased the risk. Specifically, the odds ratio at 95% CI for children in the highest quartile of consumption compared with the lowest quartile were for grains 0.59 (0.41-0.83); nuts 0.60 (0.43-0.85); vegetables 0.67 (0.48-0.94); low nutrient density foods 0.43 (0.29-0.63); and dairy 1.36 (0.97, 1.92).

2.2.2. Parental educational level

Lazzeri *et al*. (2011) showed that the prevalence of obese children increased along the parents' BMI category: from 1.4% for underweight mothers to 30.3% for obese mothers and from 4% for under-normal-weight fathers to 23.9% for obese fathers. However, they observed an inverse relationship between the parents' educational level and child obesity, the lowest educational level corresponding to the highest prevalence of obese children: 9.3% for mothers with a low educational level compared to 5.8% for mothers with a high educational level; similarly, the corresponding prevalence for fathers was 9.5% compared to 4.5% .

A population-based cross-sectional study by Mushtaq *et al*. (2011) among school age children's of five to twelve years in Lahore, Pakistan showed Children whose parents were having college (23%) or higher (29%) education had significantly higher risk of being overweight and obese ($P < 0.001$) as compared to children whose parents were illiterate (3%) and educated up to high school (10%). Children whose both parents were working (22.5%) were significantly more likely to be overweight and obese ($P = 0.002$) than those whose mother was a housewife (15.5%). They also found overweight and obesity were 9% among children having more than three siblings that significantly increased to 23% among children having one to three siblings and 35% among children having no sibling ($P < 0.001$). Twelve percent children having more than three persons in living room were overweight and obese that significantly increased to 20% among children with one to three persons in living room and 38% among children with no person in living room ($P < 0.001$).

2.2.3. Parental obesity

According to McDonald *et al*. (2009), the prevalence of overweight was 3.6 times greater in children whose mothers were obese compared with children whose mothers had an adequate BMI [adjusted prevalence ratio 3.61; 95% confidence interval (2.64, 4.93)]. A case control study among children aged10–15 years in seven schools in Dhaka, Bangladesh showed that children who had one overweight parent were nearly three times more likely to be overweight or obese (odds ratio = 2.8; 95% confidence interval: 1.5–5.2) compared to children whose parents were not overweight (Bhuiyan *et al*., 2013).

2.2.4. Genetics and Age

According to Ogden *et al.* (2012), significant racial and ethnic disparities occur in obesity prevalence among U.S. adolescents. Among girls in the 2009–2010 survey periods, non-Hispanic black adolescents (24.8%) were significantly more likely to be obese compared with Mexican American (18.6%) and non-Hispanic white adolescents (14.7%). In addition, 28.9% of Mexican American boys were obese compared with 22.6% of Non-Hispanic black and 15.7% of Non-Hispanic white boys. Further, it indicated 20.1% of boys aged 6-11 years were obese compared with 15.7% of girls of similar age in the 2009–2010 survey period.

A cross-sectional study among schoolchildren aged 9-15 years in India indicated the prevalence of obesity as well as overweight was higher in boys as compared to girls (12.4% vs 9.9%, 15.7% vs 12.9%). The prevalence of both overweight and obesity decreased significantly with increasing age till 14 years (from 21.0 to 10.6% for overweight and 18.5 to 7.6% for obesity) but tended to rise at 15 years to 12.1%. Somers *et al.* (2006) showed overweight was significantly higher in females (21.1%) than males (8.4%), and significantly higher in African (21.8%) than Colure children (13.7%). Further to this, almost 50 percent of African females were found to be overweight by the time they reached 16 years of age. Armstrong *et al.* (2006) also conducted research throughout all nine provinces in South Africa on the prevalence of overweight and obesity in primary school children between the ages of 6 to 13 years. These researchers found that girls (17.5%) more than boys (10.9%) were found to be overweight, whereas only 2.4 percent of boys in comparison to 4.8 percent of girls were obese.

2.3. Conceptual Framework

There are many factors which influence the childhood overweight and obesity. Genetic factors influence the susceptibility of a given child to develop obesity. However, environmental factors, life style factors, and culture seem to play major roles in the rising prevalence of obesity worldwide (Alemu *et al.,* 2014). According to the literature review the main factors identified are child behavioral factors, economic status of parents, lifestyle preferences, environmental and decrease in physical activity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization are identified variables that can influence overweight and obesity in children.

Depending up on the concepts of determinants on child over nutrition, the evidence from empirical studies by the conceptual framework below conceptualize how different associated factors affect child over nutrition. These factors include demographic factors which incorporate monthly income of the family, education status of the family, occupation, child age, child sex and family size and parenting style and characteristics like parent food preferences, types of food available in home, parent encouragement of child activities and parent monitoring of child's sedentary behavior. Furthermore, both the energy intake and energy output have their own effects on child over nutrition. These all factors are directly or indirectly contribute the overweight outcome. The arrow shows how those associated factors directly affect the child over nutrition and there is no backward association between determining factors as well as child over nutrition.

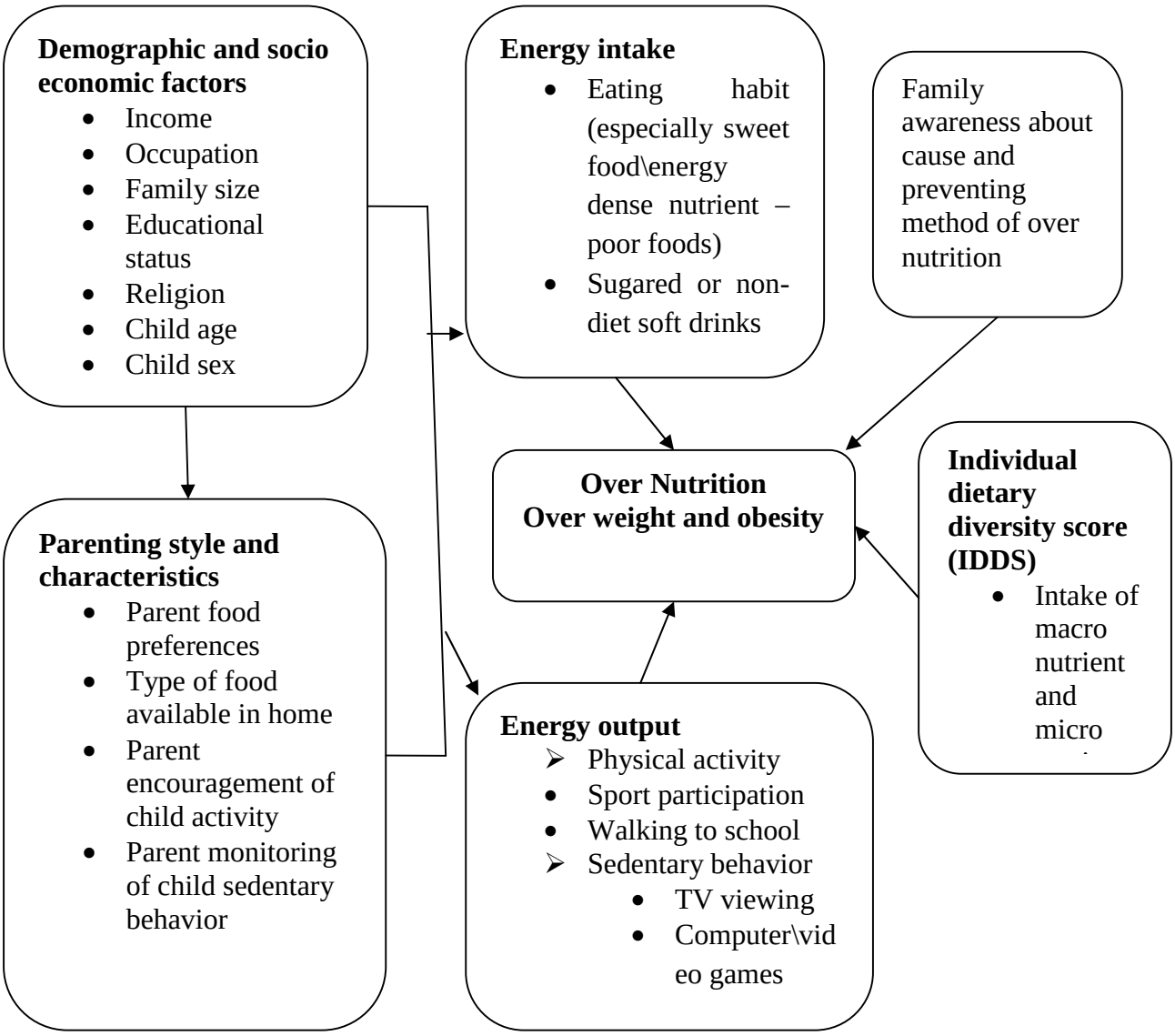

Figure 2: Conceptual framework of the study determinants of child over nutrition.

Source: own constructed (2018).

CHAPTHER THREE: METHODE AND MATERALS

3.1. Description of the Study Area and period

Bole sub- city is one of the largest sub- cities located in the eastern part of Addis Ababa (Figure 2). The sub city has 14 *woredas* (districts) and covers an area of 122.8 km² with 308, 995 populations. It has total numbers of 239 schools from these 26, 198, 7, 8 are government, private, NGO and public schools, respectively. From the total numbers of 198 private schools 65 are primary schools. The total number of students found in all schools is 37,635.According to the information obtained from Bole sub-city Administration Office, the total number of privet primary schools in *woreda* one are three and from those I took Kale Hiwot randomly which was found on $38^0$47’ 57”, in *woreda* two there are also three privet primary schools and from those I took Pristage which was found $38^0$46’ 38” and in *woreda* thirteen nine private schools are found and from those I took Get Way which was found on $38^0$47’ 58”.The study was conducted from February 21 to March 21, 2018.

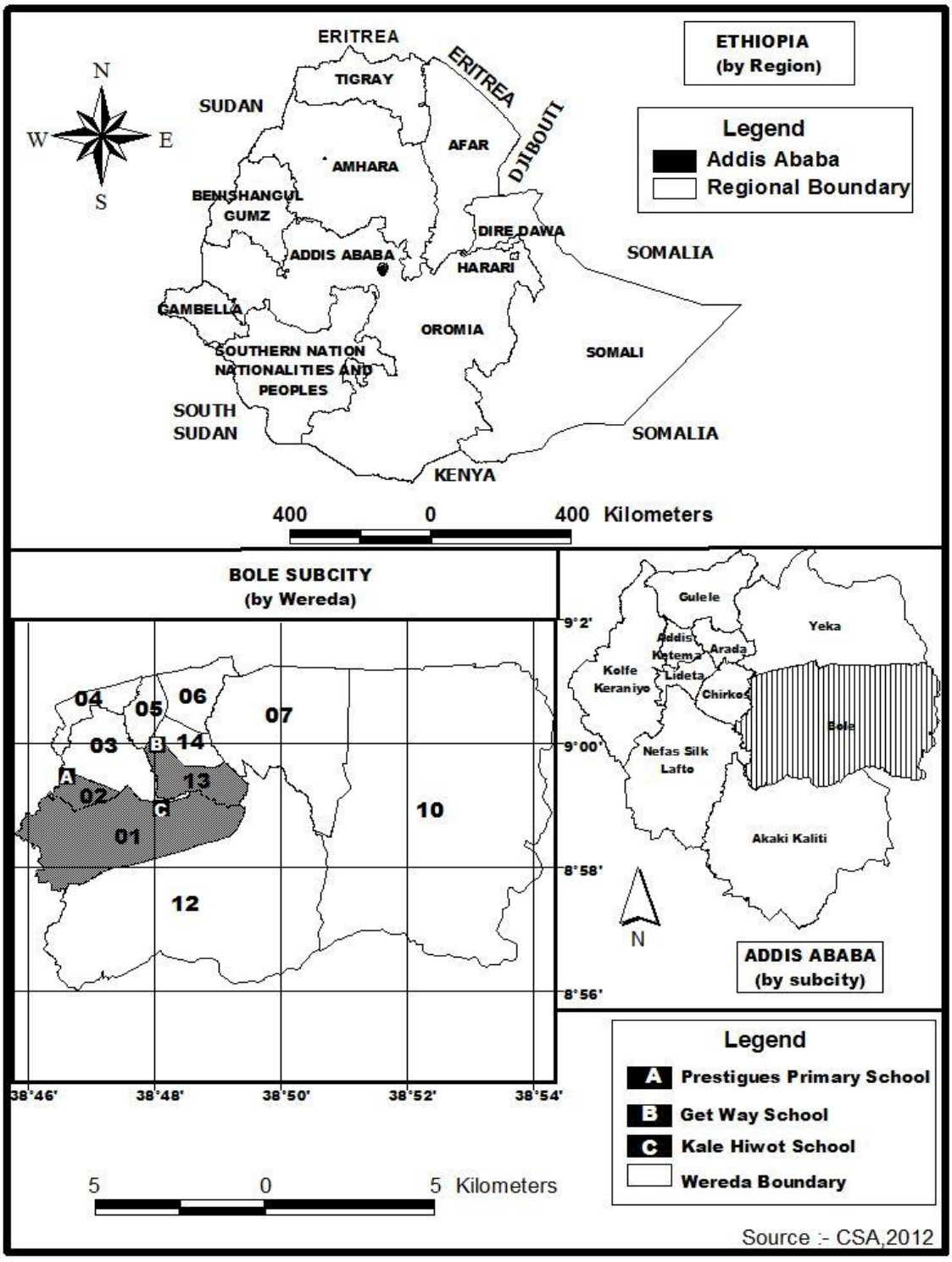

Figure 2: Map of the study area Bole sub city and the selected schools Get way, Prestigious and Kale Hiwot.

3.2. Study Design

In this study Cross-sectional design was employed to collect relevant and sufficient information with in short period of time. The study design used only quantitative research approach to assess the variables of child over nutrition in the Bole sub-city.

3.3. Source population

All private first cycle primary school children, enrolled in 2018 academic year in Addis Ababa Bole sub city.

3.4. Study Population

All randomly selected school children (aged 6-11 years) from three private primary schools (grade 1-4) children pair with their family or caregivers lived in Bole Sub-city.

3.5.1. Inclusion criteria

Healthy children from grade 1-4 in the selected private primary schools and students whose parents who gave consent were participated in the study was conducted.

3.5.2. Exclusion criteria

Child with physical disability of lower extremity, abnormal spinal curvature and Child who is sick during the study period were excluded from the study.

3.6. Data Sources

Both primary and secondary sources of data were used to collect the information required for the study. The primary data was collected from eligible respondents (family of index child) and anthropometric measurement.

3.7. Sample Size, Sampling Techniques and Procedures

3.7.1. Sample size determination

Sample size was calculated using single proportion formula. By considering proportion of overweight P = 9.8 % (0.098) was used from prevalence of overweight/obesity among primary

school children age below 12 years. (Askal *etal*.,2015). 95% confidence interval (CI) and 5% marginal error, sample size is calculated as follows:

Sample $\boldsymbol{n} = \frac{(\mathbf{Z\alpha/2})\mathbf{2p\ (1-\ p)}}{\boldsymbol{d^2}}$

Where:

n = required sample sizes

P= Estimate of the proportion of the overweight in the population.

$Z_{\alpha/2}$ = critical value for normal distribution at 95% confidence level which equals to 1.96 (z value at α =0.05)

d = an absolute precision (margin of error 5%).

$$n = \frac{(1.96)^2(0.098)\ (0.902)}{(0.05)^2} = 136$$

Considering of 10% non-response rate and design effect 2

The final sample size is (136+14) x2 = 300

3.7.2. Sampling techniques and procedures

A proportional to population size (PPS) random sampling method was employed. The study was conducted in private primary schools which are found in Bole Sub city. From the total of 14 *weredas* three *weredas* namely *wereda* one, two and thirteen, were randomly selected using lottery method to cover 20% of the total number of population, from each *wereda* one school was randomly selected. The sample size proportionally allocated to each school was proportionally allocated again to each class or grades (grade 1-4) found in each selected schools. Finally, the sample size allocated for each class (including its sections) was drawn randomly using the student list of that class as a sampling frame (figure 3).

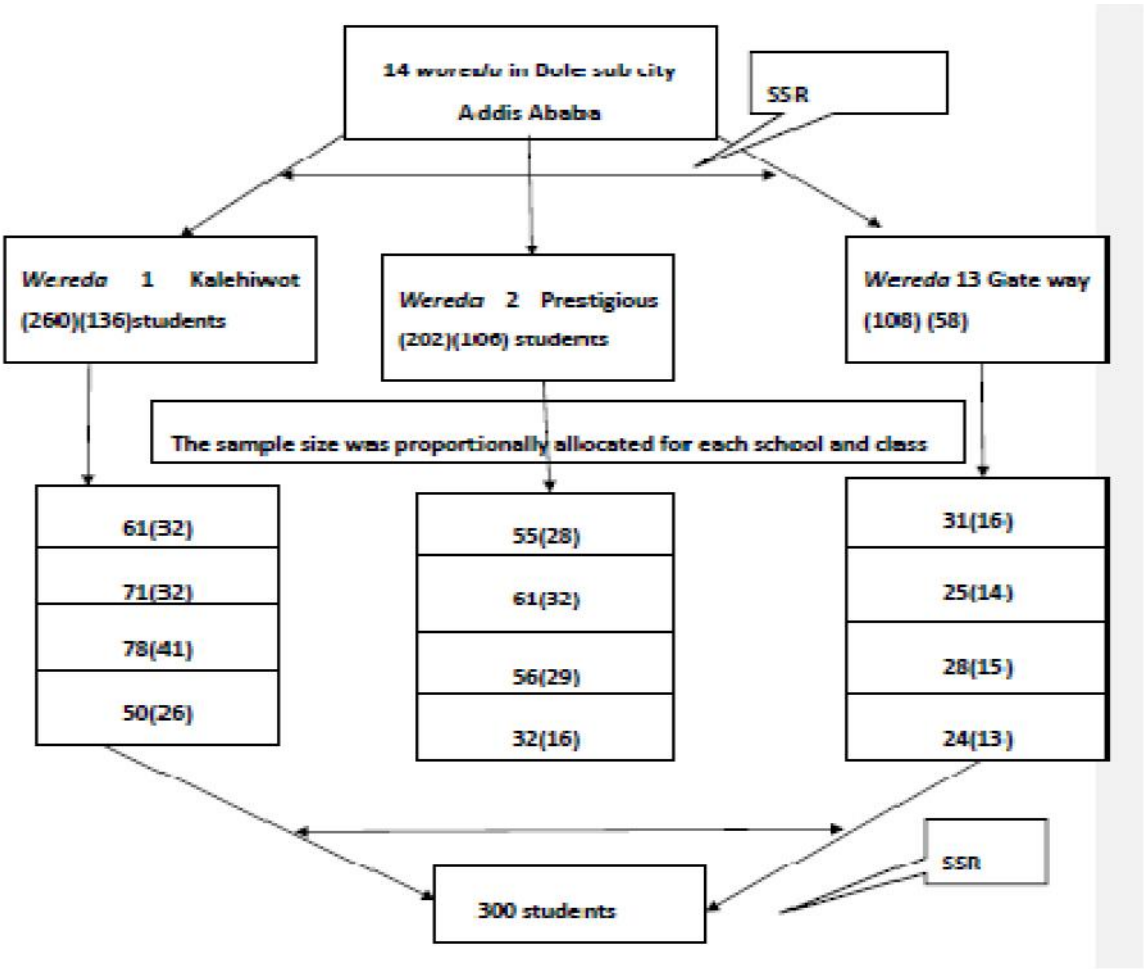

Figure 3. Sampling frame of sampling technique.

3.8. Data collection instrument and procedure

In this study only quantitative research method was used to collect the information for the determinants of child over nutrition. A structured and pretested questionnaire was adapted from WHO step instrument for chronic disease risk surveillance (WHO, 2004). Global physical activity questionnaire analysis guide (WHO, 2004) and related studies were used to collect the data. The structured questionnaire was administered to eligible respondents and families of eligible child) to collect quantitative data. The information was collected by 4 enumerators fro whom one diploma holder and the other three have BSc degree as well as fluent in Amharic language with similar experiences in field surveys who were recruited and trained on the administration of the questionnaire and anthropometric measurement. In addition, to investigate the nutritional status of the children, anthropometric measurements on height and weight were taken from each eligible child. Height of the child was measured using measuring board and their weight was measured using UNICEF electronic weight scale. All measurements were taken according to WHO anthropometric measurement guideline procedure.

Then the study was performed in two stages. In the first stage the prevalence of overweight and obesity was investigated using body mass index. In the second stage the associated factors related to overweight and obesity were examined by structured self-administered questionnaire for their parents. Weight and height of the study subjects were measured by portable electronic weight scale with a digital screen and height board respectively at the school. The measurement of height was conducted without shoes and with children keeping their shoulders in a relaxed position, their arms hanging freely and with their head aligned in Frankfurt plane and the head positioned in the Frankfort plane and the height was recorded to the nearest 0.1 cm.

To take weight measurement the participants were asked to wear light clothes or to reduce their clothes. Measurement of weight was recorded to the nearest 0.1 kg. Measurements were taken and recorded by two well-trained data collectors, which are referred as "leading" and "assisting" observer and their supervisor, respectively. The role of the "assisting" observer was to help positioning the child correctly to the instruments while the "leading" observer was recording the measurements during data collection.

3.9. Data quality assurance

To assure the data quality high emphasis was given in designing data collection. The questionnaire was prepared in English and translated into Amharic and back to English to keep the consistency of the questions. Training was given for data collectors and supervisors. Before starting the actual survey, the questionnaire was pretested on volunteer primary school students who were not participating in the main study who had similar characteristics with study population to ensure the quality of the questionnaire. Weight scale was calibrated to 0 (zero) and height board was cross checked for presence of tap meter on both edge before taking the measurement. The required information was collected from randomly selected study subjects based on the sampling procedure. The principal investigator and supervisors have monitored the data collection procedure, checked the data for completeness, and corrective measures were taken accordingly. The collected data were cleaned, coded and explored before analysis. Incomplete questionnaires were returned back to data collectors and the questionnaires with major fields missing were discarded.

3.10. Ethical considerations

The study involved the use of human participants; ethical considerations were taken into Account. Permission was sought beforehand from the relevant institution (Addis Ababa University). On the ground, the Bole sub-city Administration and each school directors were informed about the purpose of the research and permission granted. The purpose of the study and its objectives were explained, confidentiality of the responses given and no personal identity was required. The respondents were requested to participate only on voluntary basis and informed that they should feel free not to answer any question that they were not comfortable with, however, the importance of answering all the questions was emphasized. Although, it is acceptable in terms of ethics to compensate participants for the time they spend, the researcher informed participants that the study doesn't have any incentive. Oral consent was obtained from research participants after explaining all the necessary information for them. In the presentation of the study results, the researcher has not used name and kipping there privacy of the children during the anthropometric measurement in closed class by calling each individually in order to ensure confidentiality and anonymity of the respondents.

3.11. Data processing and analysis

Height, weight, age and sex of the study subjects were used to calculate BMI for age Z-score. Child's BMI for age Z-score was calculated using WHO (2007) Anthro-plus software and Z-score values were taken. The WHO (2007) cut-off points: Normal: BMI-for-age -2SD to +1SD, and Overweight: BMI for age>+1SD.Data were entered into statistical package for social Sciences (SPSS) version 22 for analysis. Descriptive analyses (frequency, mean, proportion and standard deviation) were used to describe the characteristics of the sample. Binary logistic regression was used to select variables with P value<0.3 in order to include into the final multivariable logistic regression. Multivariable logistic regression was done to assess the association between explanatory variables and over nutrition. the multicollinearity between independent variables was tested using liner regression model and Hosmer-Lemshow goodness-of-fit test was used to check the model fit for the multivariate analysis and the value of Hosmer-Lemshow was found to be great than 0.05 and the model was fit. Adjusted Odds ratio along with 95% confidence intervals was used to measure the strength of the association. Level of statistical significance was declared at p-value ($p \leq 0.05$).

3.12. Operational terms

Over nutrition: is a form of malnutrition in which nutrients are over supplied relative to the amount required for normal growth, development and metabolism. It usually refers to overweight and obesity. Obesity can be defined as a condition of abnormal or excessive fat accumulation in adipose tissue to the extent that health may be impaired. WHO defines children as that age group less than 18 (WHO, 2013).

Anthropometry is the physical measurement of the human body and its parts (Preedy, 2012).

IDDS: is usually measured using a simple count of foods or food group taken by an individual over a given reference period (Ruel, 2003).

Sedentary behavior: the time spent inactively by watching TV/ playing video game/computers

Body mass index (BMI): is the weight in kilogram divided by height in meters squared (kg/m^2)

According to WHO (2007) the following terms are defined:

Normal weight: Students with -2SDto$\leq$+1 SD of BMI for age Z-score will be considered as normal weight.

Overweight: Students with+1SD and <+2SD of BMI-for-age Z-score will be considered as overweight BMI.

Obesity: Students with height for age greater than +2 SD Z-score is considered as obese.

3.13. Hypothesis and Definition of Variables

Outcome Variable

The nutritional status of children indicated **Overweight**: Students with+1SD and <+2SD of BMI-for-age Z-score will be considered as overweight BMI.

Obesity: Students with height for age greater than +2 SD Z-score is considered as obeys.

Predictor Variables

Based on available literature the following selected predictor variables influence nutritional Status of children was explained and hypothesized as follows:

Table 1: Explanatory variables, type and expected sign, of Bole sub city, 2018.

Explanatory variable	**Type**	**Expected sign**	**Literature**
Family encourage child to do physical activity	Dummy	+	Askal *et al*. (2014)
Income of the family	Categorical	+	Eskenazi (2011), Tesfalem *et al. (*2013)
Energy in take	Categorical	+	Mocanu (2013)
Sedentary activity	Categorical	+	Jong *et al. (*2013)
Sweet foods	Categorical	+	Gohel *et a*l. (2010)
Mother's educational status	Categorical	+	Mushtaq *et al. (*2011)
Mother's occupation	Categorical	+	mushtaq *et al*. (2011)
Parental obesity	Dummy	+	Bhuiy *et al. (2013)*

NB :(+) sign indicate as the predictor variable increase the probability of being over nourished.
(-) Sign the inverse relation between the predictors and probability over nourished.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

This chapter presents the analysis and discussion of the responses gathered through the structured questionnaire and anthropometric measurement. Descriptive statistics and statistical model analysis were employed. The relationship between the dependent variables (indicator of child over nutrition such as normal and overweight) with their respective explanatory variables and the effect of the explanatory variables on the dependent variables are also presented.

4.1 Household Demographic and Socioeconomic Characteristic

Some descriptive statistics of gender, households' size, and number children in the household, parental educational characteristics, mothers' occupation and household's income of the sampled households are summarized in the table 4.1.

Table 4.1: Socio demographic characteristics of study participants among private primary school students in Bole sub city Addis Ababa, Ethiopia (n=285)

Socio demographic variables of the family	N	Percent (%)
Sex of the child		
• Men	138	48.4
• Female	147	51.6
Child age		
• 6-9	262	91.9
• 10-11	23	8.1
Religion		
• Muslim	49	17.2
• Orthodox	150	52.6
• Protestant	85	29.8
• Other	1	0.4
Family size		
• <=5	198	69.5
• >5	87	30.5
Sibling		
• 1-3	244	85.6
• >3	41	14.4
Major sours of income		
• Governmental employee	126	44.2
• Business	111	38.9
• NGO	42	14.7
• Other	6	2.2

Average monthly income of the family		
• <10000	107	37.8
• 10001-25000	150	53.0
• >25001	35	12.6
Educational status of mother		
• 1-4	18	6.4
• 5-8	40	14.0
• 9-12	83	29.1
• College / university	144	50.3
Educational status of father		
• 1-4	10	3.6
• 5-8	23	8.1
• 9-12	68	23.8
• College /university	184	64.6
Mother's occupation		
• No	33	11.6
• Yes	252	88.4
History of Parental obesity		
• No	258	90.5
• Yes	27	9.5

Socio-demographic characteristics of study participants are presented on the above Table 2. Out of 300 study subjects initially sampled in the study, 285 have participated in the study making the response rate 95%. The socio-demographic characteristics indicate that the educational status of parent were 64.6% and 50.3% of fathers and mothers, respectively, completed College/University. The religion of the parents Orthodox, Muslim and Protestants were 52.6%17.2% and 29.8%, respectively. 69.5% of the participants have less than five family sizes. 38.9% of the family lead their lives from business /trade related activities while 44.2% of the families are government employees. On average, 53.0% of the family earns 10,001-25,000 Ethiopian Birr per month. From the total participants 51.6% of the study subjects were female children. Majority of the studied children (91.9%) were 6-9 years and 85.6% of the children had one to three siblings. from the total participant of children 90.5% are the don't have parental obesity.

4.2: Parenting Style and Family Characteristics

Parenting style and family characteristics of study participants is stated in Table 2. About 60.4% of the participant eats at least one meal together every day and 34.4% of study subjects eat three

to four days per week in common plate with their parents. All most half of the participants (49.8%) eat fruit and vegetables three to four days per week. Availability of adequate space to play for children showed that the majority (55.1%) of the parent reported they haven't adequate space and greater than half (66.7%) of parents encourages the child to do physical activity. Parents have a tendency to controlling their children daily practice on watching TV or playing video game. The result from this study show that 63.9% of the parents controlling their children. From those participants who have been controlled by their parents 49.5% of the children have been spent one to two and half hours per day by watching TV or playing video games.

Table 4.2: Parenting style and family characteristics of the study participants among private primary school students age (6-11) years old in Bole sub city Addis Ababa, Ethiopia (n=285), 2018

Parenting style and family characteristics	N	Percent (%)
family eat meal together		
• Never	13	4. 6
• 1-day per week	172	60.4
• 2- days per week	98	34.4
• 3-days per week	2	0.7
family eat fruits and vegetables with meal		
• 1-2 days per week	140	49.5
• 3-4 days per week	142	49.8
• 1-2 times per day	2	0.7
place available for a child to play		
• No	157	55.1
• Yes	128	44.9
Parents encourage to do physical activity		
• No	95	33.3
• Yes	190	66.7
Family control child TV watching or video games		
• No	103	36.1
• Yes	182	63.9

4.3. Child eating habit, physical activity and sedentary behavior

The child eating habits is stated in Table 3. From the total of 285 parents responded on the eating habit of their children, 52.6%of the children eat fruit and vegetable three to four days per week. Almost all of the children (93.7%) pack lunch from home. Most of (67.7%) of the students eat rice/pasta with meat for lunch followed by 19.3% who eats injera/bread with meat/egg. In connection to this, 77.2% of the study subjects consumed meat and poultry products for three to

four days per week and 10.9% of the subjects consumed meat and poultry products for one to two days per week. Majority (98.6%) of the students had habit of eating breakfast. More than half(68.1%) of the students usually consume sweet foods (Cake, Cookies, Ice cream, Chocolate etc.) one to two days per week followed by 16.5% who consume three to four days per week. More than half (72.6%) of the study subjects take sugared/soft drinks one to two days per week. All most all (87.7 %) of the subjects eat or drink dairy product for three to four days. About 17.9% of the parents disagree that their children are taking too much sweet food products. About 16.1% of the parents disagree too many sugared/soft drinks products taken by their children.

Table4.3: Child eating habit variables among private primary school students in Bole sub city Addis Ababa, Ethiopia, 2018

Child eating habit	N	Percent (%)
Eat fruit and vegetable		
• Never	4	1.4
• 1-2 day per week	131	46.0
• 3-4 day per week	150	52.6
Get lunch		
• Eat at home	7	2.5
• Take from home	267	93.7
• Buy from school cafeteria	11	3.9
Child eat for lunch		
• Injera or bread with meat/egg	55	5.3
• Injera or bread without meat/egg	15	67.7
• Rice /pasta with meat	193	7.7
• Rice/pasta without meat	22	13.3
Eat meats, fish or poultry		
• Never	11	10.9
• 1-2 days per week	31	77.2
• 3-4 days per week	220	8.1
• 1-2 times per day	23	1.4
Eat breakfast		
• No	278	97.5
• Yes	6	2.1
Eat breakfast		
• Sometimes	14	4.9
• Often	24	8.4
• Always	247	86.7

Eat sweet food		
• Never	38	13.3
• 1-2 days per week	194	68.1
• 3-4 days per week	47	16.5
• 1-2 times per day	6	2.1
Consume sugared or soft drink		
• Never	35	12.3
• 1-2 days per week	207	72.6
• 3-4 days per week	40	14.0
• 1-2 times per day	3	1.1
Parent agree disagree child eat too much sweet foods		
• Agree	51	17.9
• Neutral	162	56.8
• Disagree	72	25.3
Parent agree disagree child drink too much sugared or soft drink		
• Agree	46	16.2
• Neutral	169	59.3
• Disagree	70	24.7

4.4: Physical activity and sedentary behavior

The child physical activity and sedentary behavior is illustrated in Table 4.4: Almost all 88.8% of the students usually get to the school daily by car as a means of transport. 55.4% of the studied children pass their leisure time by watching TV. About quarter (25.6%) of them read during their leisure time. About half (48.1%) of the study subjects were participated in vigorous-intensity sports in gymnasium or physical activity. From those who practice physical activity, 44.2% of them do physical exercise one to two days per week. All most all the students 94.4% were spent two hours of their leisure time by watching TV or playing videogames every day. About 50.0% of the children usually spent 8 or more hours sleeping.

Table 4.4: Physical activity and sedentary behavior variables among primary school students in Addis Ababa, Ethiopia (n=285)

Childs physical activity and sedentary behavior	N	Percent (%)
Child get to school		
Walking	32	11.2
By car	253	88.8
Leisure time activity		
Sleep	10	3.5
Read	73	25.6
Watch televise	158	55.4
Play foot ball	44	15.5
Sports or physical activity		
No	148	51.9
Yes	137	48.1
Sport days per week		
Never	148	51.9
1-2 day per week	126	44.2
3-4 days per week	11	3.9
Time spent doing sport		
Never	148	51.9
15-30 minutes	89	31.2
45 minutes	48	16.8
Time spent watching TV playing video games		
<1 hr	10	3.5
1-2 hr	269	94.4
>2 hr	6	2.2
Child sleep hours per day		
8 hr	157	55.1
9 hr	102	35.8
10 hr	26	9.1

4.5. Family awareness about cause and preventing methods of over nutrition

Family awareness about cause and preventing methods of over nutrition presented in Table 5. Majority (91.2%) of parents were aware of the consequence of excess calorie intake (being overweight) and its effect on health. Moreover, 79.6% of the parent knew the cause of overweight. The children who eat too much sweet food and took soft drink accounts for 29.1% and 27.0%, respectively.

Table 4.5: Family awareness about cause and preventing methods of over nutrition among first cycle primary school students in Addis Ababa, Ethiopia (n=285)

Family awareness about overweight	Response category	N	Percent (%)
Do you know the efface of over on health	No	25	8.8
	Yes	260	91.2
Do you know cause of overweight	No	58	20.4
	Yes	227	79.6
Reason for overweight	Not doing physical activity	77	27.0
	Eat too much sweet food and soft drink	83	29.1
	Eat meat, fish or poultry	19	6.7
	Sleep for long time	50	17.6
Is overweigh preventable	No	66	23.2
	Yes	219	76.8
How overweight prevent	Doing physical activity	118	41.4
	Eating fruit and vegetable	20	7.0
	Decrease sweet food and soft drink	66	23.2
	Decrease fatty food	17	6.0
BMI for age of the student	Normal	172	60.4
	Overweight	113	39.6

4.6. Individual Dietary Diversity Score (IDDS)

In this study, most of the participants consumed meat (beef, lamb, chicken, and fish) and dairy products (milk, yoghurt and cheese) and egg beside foods processed from grains (teff and rice). Few participants consumed legume products among seven food categories within 24 hours a day before the survey date. There was a minimum consumption of tubers. Very few children consumed vitamin A rich fruits and vegetables. In addition to showing a proxy for adequate micronutrient density of food IDDS has been shown to be association with nutritional status of individual (children age 6-11 years) after controlling cofounding socioeconomic factors. In this study the bivariate logistic regression result revealed that there is statistical significant

association with over nutrition while in multivariate logistic regression has no statistical significance with dietary diversity.

Table 4.6: Individual Dietary Diversity Score (IDDS)

The child diet intake on 24 hrs	Response category	N	Percent (%)
Diet diversity	Poor	275	96.2
	Highest	10	3.5

4.7: Factors associated with over nutrition

In order to figure out factors associated with over nutrition/ high BMI of children demographic factors such as sex, age of child and Socioeconomic factors such as parental and maternal education, maternal main occupation, household monthly income, number of children in the household and household size; child eating habit, physical activity and sedentary behavior, personal factors such as awareness of the family about cause and preventive methods were tested.

Table 4.7: Bivariate Analysis Result over Nutrition among first cycle primary school students in Bole sub city, 2018.

predictor Variables	Crude Odds Ratio	P-value
Sex of child		
1.Men	1.206	0.439
2. **Female** [rc]		
Education of mother		
1-4	1.849	
5-8	1.978	0.253*
9-12	.731	
College [rc]		
Education of father		
1-4	.833	
5-8	1.528	
9-12	1.267	0.47
College [rc]		
Number of sibling		
< 3	1.838	0.645
>3 [rc]		
Average monthly income of family in ETB		
<10000	0.999	
10000-25000	1.000	0.044
>25000 [rc]		
Family encourages the child to do physical activity or sport		
No[rc]	0.667	0.191*

Yes		
Time allowed by parents to watch TV/video games No 1-1:30 hours **1:30-2:30 hours** [rc]	 1.157 1.842	 0.110*
Food Type Child eats for lunch most of the time Injera or bread with meat/egg Injera or bread without meat/egg Rice /pasta with meat **Rice/pasta without meat** [rc]	 0.411 0.208 0.348	 0.099*
Consumption of sweet foods **Never** [rc] 1-2 days per week 3-4 days per week 1-2 times per day	 0.600 1.376 0.556	 0.061
Consumption of meat or paltry **Never** [rc] 1-2 days per week 3-4 days per week 1-2 times per day	 0.764 0.662 0.566	 0.598
History of parental obesity **No** [rc] Yes	 14.933	 0.00**
Hours of child sleep per day 8hr >9hr [rc]	 0.690	 0.052*
Diet diversity >4 highest **<4 poor** [rc]	 3.664	 0.064*

[rc] Reference Category, * Significant at P – Value of 0.3; ** Significant at P – Value of 0.01***

Table 4.8: Multivariate Logistic Regression Estimates for over Nutrition

Predictor variables	Crude odds ratio	Adjusted odds ratio	P-value
Educational status of the mother • 1-4 • 5-8 • 9-12 • College [rc]	 1.849 1.978 0.944	 1.666 2.048 0.764	 0.414
Average monthly income of family in ETB • <10000 • 10001-25000	 0.999 1.000	 0.303 0.531	 0.011*

• >25000 [rc]			
family encourages the child to do physical activity or sport • **No** [rc] • Yes	0.667	0.345	0.011 *
Time allowed by parents to watch TV /video games • No • 1-1:30 Hours • 1:30-2:30 Hrs [rc]	1.157 1.842	0.713 2.263	0.05*
Food Type Child eats for lunch most of the time • Injera or bread with meat/egg • Injera or bread without meat/egg • Rice /pasta with meat • Rice/pasta without meat[re]	0.411 0.208 0.348	0.309 0.131 0.239	0.044*
History of parental Obesity • **No** [rc] • Yes	14.933	15.089	0.000**
Diet Diversity • >4 highest • <4 poor **[rc]**	3.664	1.624	0.598
Hours of child sleep per day • 8hr • >9hr [rc]	0.690	0.959	0.883

[rc]Reference Category* Significant at P – Value of 0.05 ** Significant at P – Value of 0.01

As displayed in table 4.7: above, the multivariate analysis identified encouragement of family to do physical activity or sport, Time allowed by parents to watch TV /video games, child eat for lunch and history of parental obesity as significant determinants for over nutration.While education of mother, diet diversity, hours of child sleep, consumption of sweet food and average monthly income of the family were found in significant association with overweight.

The magnitude of over nutrition found in this study was 39.6% [95%CL= (34.4-44.6)]. It is lower than prevalence estimate of other countries, including Chicago in the US where 40.5% of 6-12 year old children where obese (Margellos-Anast *et al.* 2008); it is computable with the estimated global magnitude of overweight and obesity among school children aged 6- 11 year old (34%) (Susan *et al.*,2012). It is computable with the overall magnitude of overweight including obesity among 6-14 years school children 32% in Emirate (Junaibi *et al.,* 2013. In

addition the magnitude of overweight and obesity reported in this study is lower than the magnitude of overweight and obesity indicated by Ayman *et al.,(*2016) in Jordan (40%). This may be due to life style and food habit difference between developing and developed countries.

However, the magnitude of over nutrition in our study is higher than the magnitude reported in some developing countries. A report by McDonald *et al.* (2009) from Bogota, Colombia among the school-age children of 5-12 years showed that 11.1% and 1.8% for overweight and obesity, respectively. It was also higher than 14.3% prevalence of overweight and obesity reported in the schools of Kutahya, Turkey (Kaya *et al.,* 2014), even though 6.5% prevalence of obesity was reported in their study.

The magnitude of over nutrition indicated in this study was higher than the prevalence reported in many developing countries including Ethiopia. A study done in Tanzania among children 6-9 and 10-12 years, showed 5.8% and 5.1% ,respectively in Dodoma and Kinondoni municipalities (Mosha and Fungo, 2010); whereas the magnitude of obesity 6.4% and 5.4% among 6-9 and 10-12 years respectively are higher than 5% reported in this study (Mosha and Fungo, 2010). In Nigeria the magnitude of overweight and obesity were 9.7% and 1.8% respectively. The magnitude of overweight and obesity 14.4% and 5% respectively (Danladi *et al.,* 2012) .It is also higher than 17.4% magnitude of overweight/obesity among school age children of 5-14 years in Tamale the capital city of the Northern region of Ghana (Mogre *et al.,* 2013). Coming to our country there are few researches done in the same topic and the magnitude of over nutrition indicated in this study was higher than the others. The magnitude of overweight and obesity 14.4% and 5% respectively reported in this study was higher than the magnitude reported in Hawasa among children was 12.9% and 2.7% for overweight and obesity respectively.(Tesfalem *et al.* ,2012).In Addis Ababa the magnitude of over nutrition among primary school children was 9.8%, (Askal *et al.* 2014).

Over nutrition and associated factors

History of parental Obesity: The study finding show that having history of obesity in the house hold, the greater the chance of being overweight (P0.000**). So this shows that this might be increases in the child being obese. Those who have history of parental obesity are more likely exposed for obesity by 15.8 times than their counterpart. .A case control study among children

aged10–15 years in seven schools in Dhaka, Bangladesh showed that children who had one overweight parent were nearly three times more likely to be overweight or obese (odds ratio = 2.8; 95% confidence interval: 1.5–5.2) compared to children whose parents were not overweight (Bhuiyan *et al*. 2013).

Food Type Child eats for lunch most of the time: Food type child eat for lunch most of the time Rice /pasta with meat is found as an important factor for overweight. The coefficient indicates inverse relationship that's as child decrease those foods the child has less probability of being overweight. The consumption of rice/pasta with meat or egg for lunch exposes by 0.309 times to obesity than those pack injera or bread without meat or egg for lunch.

Time allowed by parents to watch TV /video games: Time allowed by parents to watch TV/video game from 1:30-2:30hr a day was 2.263 times more often over weight compared to children watching televise <1h per day. Cross-sectional study by Jong *et al*. (2013) among children aged 4–13 years in the city of Zwolle, Netherland showed that children viewing TV more than 1.5 h a day were 1.65 (95% confidence interval: 1.15–2.38 times) more often overweight compared similar age children watching TV<1 h per day.

Family encouragement of children to do physical activity or sport: In this study family encouragement of their children to do exercise is significantly associated with over nutrition. Multiple logistic regressions showed that, the odds of over nutrition for students whose family's doesn't encourage them to do physical activity were 0.345 times higher than the likely hood of over nutrition for those students whose families encourage them to do physical activity. A study done by Askal *et al.* (2014) among primary school children in Bole sub city also reported students whose families doesn't encourage to do physical activity were 1.79 times more overweight. Than those who families encourage them to do physical activity.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1. Conclusion

This study Revealed that the magnitude of over nutrition was found to be high among private first cycle primary school children Food type child eat for lunch most of the time Rice /pasta with meat is found as an important factor for overweight at P=0.033*,odds ratio 0.411and CI (0.099-0.969),Time allowed by parents to watch TV/video game also important factor at P=0.05*,odds ratio 1.842 and CI(0.253-2.004),family not encouragement of their children to do physical exercise is significantly associated with over nutrition at P=.0.02*,odds ratio 0.667 and CI (0.121-0.757) and history of Parental obesity on the family shows that the greater the chance of being overweight at P=0.000* with 14.933 odds. If primary preventive measures is not taken immediately, prevalent of over nutrition among children In Addis Ababa, might increase rapidly in the coming few years.

5.2. Recommendation

In addition to useful experiences and observations made during the field work, the results presented in this study generated several issues that warrant further evaluation. In order to prevent this burden ministry of education and ministry of health, school teachers and parents share responsibility. So everybody needs to be aware of the risk factors. Based on the finding of this study the following recommendations were forwarded:

Federal Minister of Health

They should give emphasis in planning and designing child health services and give priority for prevention of childhood overweight and obesity. Promoting active lifestyles and healthy diets should be a national public health priority. Initiation of the preventive measures to be integrated in the national nutrition program to reaching the whole community.

The health office should initiate awareness through publications and mass media and prepare short course trainings to health extension workers and school teachers and parent committees at school on preventive measures like health dieting, increasing the physical activities. School base preventive program should be set, which can actively participate children, child family, and the school staffs by giving priority to private schools should be considered. One of the determinants

of overweight is lack of physical activities, so private school shall have enough compound for children to play. The government should provide school plots for free for private investors. The health office should work in collaboration with the education office, other sectors and NGOs to advocate awareness on the importance of prevention measures.

Researchers

- To undertake more comprehensive research to determine more on risk factors of childhood obesity.

Schools

Health, nutritional and physical education should be given through school media and schools need to keep students active and give emphasis for most of physical exercise. Improve the awareness of the community through distribution of leaflets, posters, and newspapers and through school media by working with responsible sectors. School based preventive program should be launched and private schools should be the first target for intervention. Schools should increase more physical education program in a week. Also Schools should focus on maximizing their free space which is available for physical exercise and the students to play freely. Health and nutrition education has to be included in the school curricula.

Family

The families should be encourage their children to do physical exercise at a daily bases and controlling their diet preference to avoided a carbohydrate and protein rich foods in their meals.

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Appendices

Appendix A. Participant Information sheet and consent

My name is _____. I am working as a data collector for the study being conducted by BrhanAsefa who is studying for her master's degree at Addis Ababa university center of food security and development. I kindly request you to lend me your attention to explain about the study and you being selected as the study participant.

Title of the study:

Prevalence of overweight and obesity and associated factors among private primary school students in Bole Sub City Addis Ababa, Ethiopia

Objective of the study:

To assess the prevalence of overweight and to identify associated factors among private primary school children in Bole Sub City, Addis Ababa,

Purpose of the study:

This research is for partial fulfillment of MSC work; in the meantime it will identify the prevalence of overweight and obesity and associated factors among first private primary school children in Bole sub city, Addis Ababa. Thus, this study is beneficial and serves as a bench mark for the health planners to design prevention strategy and enhance intervention activities.

Risk and Benefit of the study:

Your participation in this study will not involve any known risks or minimal risk to you. By participating in this study and answering the questions you will not receive any direct benefit. However, this will help to improve the prevention and control of overweight and obesity among school children in Bole sub city, Addis Ababa based on information obtained from you.

Confidentiality:

The information you will provide us will be confidential. There will be no information that will identify you in particular. The findings of the study will be generalized for the study population

and will not reflect anything particular of individual persons. The questionnaire will be coded to exclude names and identity card of the participants. No reference will be made in oral or written reports that could link participants to the research.

Rights:

Your participation in this study is on the voluntary basis and you have a right to refuse to participate in this study or not to answer the questions if you feel uncomfortable. You have full right to stop the data collection process at any time. If you have any questions or concerns about the research you can contact the concerned person with the following address given below.

Principal investigator Address

Name: Brhan Asefa, Addis Ababa Ethiopia

Address Addis Ababa, Ethiopia

Tel No: + 251 9 46696316

E-mail brhan.as@yhoo.com

Appendix B. Declaration of Voluntary Consent

The participant information sheet has been read to me. I have clearly understood the purpose of the research, the procedures, the risk and benefits, issues of confidentiality, the right of participating and the contact address for any queries. I have had the opportunity to ask questions for things that may have been unclear and any questions that I have asked have been answered to my satisfaction. I understood that I have the right to withdraw from the study at any time without any precondition. Therefore, I declare my voluntary consent to participate in this study with my signature as indicated below.

Signature of the data owner_____ Date ___/_____/_____

Signature of the data collector_____ Date___/_____/_____

If yes, proceed

If no, thank and stop here.

Data collector name_____

Data collector code_____

School name_____

Appendix C: Questionnaire (English)

Questionnaire to determine the prevalence of over nutrition and factors associated with among primary school children age (6-11) year's old in Bole Sub City, Addis Ababa, to be filled by participant parent.

Part 1. Socio-demographic variables			
S. No	**Questions**	**Responses**	**Code**
Q101	Sex of your child	1. Men 2. Women	
Q102	What is your child's age	----------.	
Q103	Religion	1. Muslim 2. Orthodox 3.Protestant 4. Other (Specify) ----------.	
Q104	How many people including yourself, live in your household?	----------.	
Q105	What is the major source of income for your family	1. Governmental employee 2. NGO employee 3. Business* 4. Farmer 5. Daily laborer 6. Other (specify)…..…….	
Q106	What is the average monthly income of your family?	_____EtB/month	
Q107	Is there owned vehicle to transport your family from place to place?	1. Yes 2. No	
Q108	Educational status of mother	1. Can't read and write 2. 1-4 3. 5-8 4. 9-10 5. 11-12 6. College/university	
Q109	Educational status of father	1. Can't read and write 2. 1-4 3. 5-8 4. 9-10 5. 11-12 6. College/university	
Q110	Does the mother have job	0. No 1. Yes	

Q111	Is there parental obesity	0. No 1. Yes	
Q112	How many siblings does your child have?	1. None _____ in number	
Q113	What is the current grade of your child?	Grade _____	

Part 2. Questions related with parenting style and family characteristics			
Q201	How often does your family eat at least one meal together each day?	_____	
Q202	How often in a week does your family eat fruits and/or vegetables with your main meal?	_____	
Q203	Does your family have adequate space for the children to play?	1. Yes 2. No	
Q204	Does your family encourage the child to be physically active or play sports?	1. Yes 2. No	
Q205	Does your family have any firm limits or agreements with the child about how much he/she can watch TV or play video games?	1. Yes 2. No	
Q206	If yes, how much time the child is allowed to watch Television or play games per day?	0. NO 1. 1-1:30 2. 1:30-2:30	
Part 3. Questions related with child Eating habit			
Q301	How often in a week does your child eat fruits and vegetables?	1. Never 2. 1-2 days per week 3. 3-4 days per week 4. 1-2 times daily	
Q302	How does your child usually get his/her lunch after or while at school?	1. Eat at home 2. Take from home 3. Buy from school cafeteria 4. Do not eat lunch	
Q303	Most of the time, what does your child eat for his/her lunch?	1. Injera or bread with Meat/egg 2. Injera/bread without meat/egg 3. Rice /pasta with meat 4. Rice/pasta without meat	
Q304	How often in a week does your child eat Meats, fish or poultry?	1. Never 2. 1-2 days per week 3. 3-4 days per week 4. 1-2 times daily	
Q305	Does your child eat breakfast?	1. Yes 2. No	
Q306	If yes to Q305, how often does your child eat breakfast?	1. Sometimes 2. Often	

		3. Always	
Q307	How often, in a week, does your child usually eat sweet foods (Cake, Cookies, Ice cream, Chocolate etc.) between meals?	1. Never 2. 1-2 times per week 3. 3-4 times per week 4. 1-2 times daily	
Q308	How often, in a week, does your child usually drink sugared or non-diet soft drinks?	1. Never 2. 1-2 times per week 3. 3-4 times per week 4. 1-2 times daily	
Q309	Do you agree/disagree your child should eat too many sweets (candy, ice cream, cake or chocolates)	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree	
Q310	Do you agree/disagree your child should drink too much sugared or soft drinks (soda, fruit flavored drinks etc.)	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree	
Q311	How often, in a week, does your child drink or eat dairy products?	1.Never 2.1-2 times per week 3.3-4 times per week 4.1-3 times daily	

Physical activity and sedentary behavior of the child			
Q312	How does your child usually get to the school?	1. Walking 2. Riding bicycle 3. By car 4. Other (specify) _____	
Q313	What does your child usually do, during his/her leisure time?	1. Sleep 2. Read 3. Watch televise 4. Play ball (basketball football, volleyball etc.) 5. Help parent 6. Other (specify) _____	
Q314	Does your child participate in any vigorous-intensity sports or physical activity that causes large increases in breathing or heart rate?	1. Yes 2. No	
Q315	If yes to Q313, how many days in the week does your child participate in physical activities or sports?	0.NO 1.1-2days 2.3-4 days 3. above 4 days	
Q316	If yes to Q313, approximately how many minutes continuously does your child spend doing physical activity or sports?	0.NO 1.15-30 minutes 2.30-45 minutes 3. above 45 minutes	
Q317	In his/her free time in a week, how many hours does your child spend watching televise &playing video games per day?	1. < 1 hour 2. 1 hour 3. 2 hours 4. 3 hours 5. 4+ hours	
Q318	How many hours of sleep do your child usually get each day?	_____	

Part 4. Questions related with family awareness about cause and preventing methods			
Q 401	Do you know that being overweight can cause health problem?	1. Yes 2. NO	
Q 402	Do you know the cause of overweight for your child?	1.Yes 2.NO	
Q 403	If yes to Q402 what is the reason?	1.not doing physical activity 2.eating sweet food and soft drink 3.eating meats, fish or poultry 4. sleep for long time 5.other	

Q 404	Do you know over weight on children is preventable?	1.Yes 2.NO	
Q 405	If yes to Q404 how?	1.doing physical activity 2.eating fruits and vegetable 3.decrease sweet food and drink 4.decrease fatty food 5. other	

Part 5: 24 hour diet history of child		
No	**Question**	**Respondent**
Q 500	Now I would like to ask you about (other) liquids or foods that a child had yesterday during the day or at night. I am interested in whether you child had the item even if it was combined with other foods. Please include foods and liquids consumed outside your home. Did a child drink/eat:	
Q 501	Foods made from grains such as *teff*, oats, maize,barley, wheat, sorghum, millet or other grains e.g. *Injera*, bread, rice, noodles etc	0. NO 1. Yes
Q502	Any food made from root and tubers e.g. kocho, bulla, white potato, white yams, cassava, whit sweet potato	0. NO 1. Yes
Q 503	Any food made from legume and nuts e.g. broad beans, kidney beans, haricot beans, soya beans, field peas, cow peas, pigeon peas, chick peas, lentils, ground nuts, peanuts, etc	0. NO 1.Yes
Q504	Dairy products such as Any milk, yoghurt, cheese etc	0. NO 1. Yes
Q 505	Fleshed food e.g. Any beef, pork, sheep, lamb, goat, chicken, duck meat? Any fresh or dried fish? Any liver/organ meats?	0. NO 1.Yes
Q 506	egg	0. NO 1. Yes
Q 507	Vitamin A rich fruits and vegetables e.g. cucumber, pumpkin, carrots, or sweet potatoes that yellow or orange inside and Ripe mango, papayas, avocado etc	0. NO 1. Yes

Part. 6 Anthropometry			
S/No	**Measurements**	**Results**	**Code**
Q601	Height in centimeter	..... (cm)	
Q602	Weight in kilogram	..... (Kg)	

አፐንዲክስ ሀ :የጥናቱ ተሳታፊዎች የመረጃእና የስምምነት መግለጫቅጽ

አዲስአበባ ዩኒቨርሲቲ

ድህረ ምርቃት/ት ክፍል የሀገር ልማት ጥናት ሳይንስ ኮሌጅ

ሰላም ጤናይስጥልኝ፡፡ስሜ----------እባላላሁ፡፡ዛሬእዚህየተገኘሁት ብርሀን አሰፋ የአዲስ አበባ ዩኒቨርሲቲ የሀገር ልማት ጥናት ሳይንስ 2ኛድግሪ ማሟያለ ሚሰራው ጥናታቂ ፅሁፍ መረጃስብሳቢ ሆኝነው፡፡ በመሆኑም ስለጥናቱ አጠቃላይ ሁኔታና እርስዎም የጥናቱ ተሳታፊ በሚሆኑበት ሁኔታላይ ገለፃ እንዳደርግሎት በጥሞናእንዲያዳምጡኝ በአክብሮት እጠይቃለሁ፡፡

የጥናቱ ርዕስ፦ በቦሌ ክፍለ ከተማ፣ አዲስአበባ የግል አንደኛ ደረጀ ት/ቤት የመጀመሪያ ደረጃ (ከ1-4ኛክፍል) ተማሪዎች መካከል የክብደት መጠን መጨመር ስርጭት እና ተያያዥ ነገሮች፡፡

የጥናቱ ዓላማ፦ በቦሌ ክፍለ ከተማ፤አዲስአበባ የግል አንደኛ ደረጃ ት/ቤት የመጀመሪያ ደረጃ (ከ14ኛክፍል)ተማሪዎች መካከል የክብደት መጠን መጨመር ስርጭትን ማጥናት እና ተያያዥ ነገሮችን ማወቅ፡፡

የጥናቱ አስፈላጊነት፦ ይህ ጥናት በመምግብ ዋስትና ለሁለተኛ ድግሪ ማሟያ ተብሎ የተዘጋጀ ሲሆን በዚሁ አጋጣሚ ደግሞ በቦሌ ክፍለ ከተማ አዲስአበባ ከተማ በአንደኛ ደረጃ ት/ቤት ተማሪዎች ላይ የክብደት መጠን መጨመር ማጥናት እና ተያያዥ ነገሮችን ማወቅ ነው፡፡ስለዚህ ይህ ጥናት ጠቃሚ እና በጤና ዙሪያ እቅድ ለሚያወጡ የመከላከያ መንገዶችን እንዲቀይሱ እና ተግባራዊ እንዲሆንም መሰረት በመሆን ያግዛል ተብሎ ይጠበቃል፡፡

የጥናቱ ሂደት እና የሚፍጀው ጊዜ፦ ለጥናቱ ጠቃሚና አስፈላጊ መረጃ ለማግኘት 43 ጥያቄዎችን ለመምላት ቃለመጠይቅ አደርግሎታለሁ፡፡ የልጁን ቁመት እና ክብደት ይሆናል፡፡ መረጃውን ለመሰብሰብ የሚፈጀው ጊዜ 30 ደቂቃ ይሆናል፡፡ ስለዚህ እርሰዎ የጥናቱ ተካፋይ ይሆኑ ዘንድ በአክብሮት እጠይቃለሁ፡፡

የጥናቱ ጉዳት እና ጥቅም፦ በጥናቱ ውስጥ በመሳተፍ እና ጥያቄያችንን በመመለስ ቀጥታ የምታገኘዉ/ኝው ምንም ነገር አይኖርም፡፡ ነገር ግን ጥናቱ ውሰጥ በመሳተፍ/ፍሽ እና በምትሰጡን ትክክለኛ መረጃ በቦሌ ክፍለ ከተማ አዲስአበባ የተማሪዎችን የክብደት መጨመር ለመከላካል እና ለመቆጣጠር ለሚደረገው ጥረት ይረዳል፡፡ በጥናቱ ውሰጥ በመሳተፍ/ፍሽ የሚደርስብህ/ብሽ ምንም አይነት የታወቀ ጉዳት አይኖርም፡፡

ሚስጥር ስለመጠበቅ፦ የሚሰጡትን መረጃ ሁሉ ምስጢርነቱ የተጠበቀ ነው። ለዚህም እርሶነትዎን የሚገልጽ ምንም ነገር የለም፤ የጥናቱ ውጤት ለግለሰብ ወይም ደግሞ ለቤተሰብ ሳይሆን ለአጠቃላይ ህብረተሰብ የሚውል ይሆናል። ጥያቄው በኮድ ስለሆነ ምንም የእርሶን መልስ ከእርሶ ጋር የሚያይዝ ነገር አይኖረም።

የተሳታፊው መብት፦ በዚህ ጥናት ለመሳተፍ ሙሉ ፈቃደኝነት ያስፈልጋል። በዚህ ጥናት የመሳተፍ ወይም ያለመሳተፍ ሙሉ መብት አለዎት። ለመሳተፍ ካልፈለጉ ደግሞ በማንኛውም ጊዜ በመሀል ራስዎን ከጥናቱ ማግለል (ማቋረጥ) ይችላሉ። ካቋረጥኩኝ ጥቅም ይጎልብኛ ልብለው አያስቡ። መመለስ የማይፈልጉትን ማንኛውም ጥያቄ ለመመለስ አይገደዱም። ጥናቱን በተመለከተ ጥያቄ ወይም የሚያሳስበዎት ነገር ካለ የሚመለከተውን ሰው ከዚህ በታች በሰፈረው አድራሻ ማግኘት ይችላሉ።

<u>ዋና አጥኚ አድራሻ፡ አዲስአበባ</u>

ስም፡ብርሃ ንአሰፋ

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አፕንዲክስሀ :በፈቃደኝነት ላይ የተመሰረተ የስምምነት ማረጋገ ጫፎርም

የተሳታፊው መረጃ ፎርም ተነቦልኛል። የጥናቱ ዓላማ ያለውን ጉዳትና ጥቅም፤ ሚስጥር አጠባበቅ፤ የመሳተፍ እናያለመሳተፍ መብት እንዲሁም ችግር ካለ ከማንጋር መገናኘት እንዳለብኝ ሁሉ ተገልጾልኛ፤ ጥያቄ ካለኝ ደግሞ እንድጠይቅ እድል ተሰጥቶኝ በመሀል ደግሞ ጥናቱን ለማቆም ከፈለኩኝ በማንኛውም ጊዜ ከጥናቱ /ከተሳታፊነት/ መውጣት እንደምችል፤ በመጨረሻም መመለስ የማልፈልገውን ጥያቄ ያለመመለስ መብቱ እንዳለኝ ከተረዳሁኝ በኋላ በሙሉ ፈቃደኝነት በዚህ ጥናት ለመሳተፍ የወሰንኩኝ መሆኔን ከዚህ በታች በተቀመጠው ፊርማዬ አረጋግጣለሁ።

የመረጃ ሰጪ ፊርማ ..... ቀን.....

የመረጃ ሰብሳቢ ፊርማ ..... ቀን.....

ከተስማሙ ይቀጥሉ

ካልተስማሙ ያቋርጡ

አመሰግናለሁ!

AppendixC: መጠየቅ የመጠየቁ መለያ ቁጥር---------- የት/ቤቱ ስም----------

በቦሌ ክፍለ ከተማ በግል አንደኛ ደረጃ ት/ቤት የመጀመሪያ ደረጃ (ከ1-4ኛክፍል) ተማሪዎች መካከል የክብደት መጠን መጨመር ስርጭትን ለማጥናት እና ተያያዥ ነገሮችን ለማወቅ የተዘጋጀ፡፡ በመረጃ ሰብሳቢዎች የሚሞላ፡፡

ክፍል 1፡አጠቃላይ መረጃ

የቤተሰብ አጠቃላይ መረጃ			
ተ.ቁ	ጥያቄ	መልስ	
ጥ101	የልጆጾታ	ሴት ወንድ	
ጥ102	የልጆእድሜ	……..	
ጥ103	ሀይማኖት	1. ሙስሊም 2. ኦርቶዶክስ 3. ፕሮቴስታን	
ጥ104	ስንት የቤተሰብ ኣባል አለዎት?		
ጥ105	የገቢ ምንጭዎ?	1.የወርደመዎዝ 2. በንግድ 3.የውጪ ድርጅት 4.ሌሎችካሉይገለጽ----------	
ጥ106	የአባት የትምህርት ደረጃ?	ከ 1-4ኛክፍል ከ 5-8ኛክፍል ከ 9-10ኛክፍል ከ 11-12ኛክፍል ኮሌጅ/ዩኒቨርሲቲ	
ጥ107	የእናት የትምህርት ደረጃ?	ከ 1-4ኛክፍል ከ 5-8ኛክፍል ከ 9-10ኛክፍል ከ 11-12ኛክፍል ኮሌጅ/ዩኒቨርሲቲ	
ጥ108	የቤተሰብዎ የወር ገቢ?	_____ብር	
ጥ109	የግሎ የቤት መኪና አሎት?	አዎ የለኝም	
ጥ110	ልጅዎስን ትወንድም /እህቶች አለዉ/ት?	ምንም _____ በቁጥር	
ጥ112	ልጅዎየስንተኛ ክፍል ተማሪነው/ናት?	_____በክፍል	
ጥ113	በቤተሰብ ውስጥ ወፍራም ሰው አለ?	አዎ የለም	
ጥ114	እናት ስራ አላት	አዎ የለም	

ክፍል 2፡ የመጠይቁ ሁለተኛ ክፍል በልጁ/ት... የአስተዳደግ ሁኔታ እና የቤተሰብ አጠቃላይ ሁኔታ ላይ ያተኩራል። ስለዚህ የሚችሉትን ያህል ትክክለኛ መረጃ እንደሚሰጡኝ ተስፋ አደርጋለሁ።

ተ.ቁ	የአስተዳደግ ሁኔታ	መልስ
ጥ201	ቤተሰብዎ በአንድ ገበታ ላይ በቀን ስንት ጊዜ ይመገባል?	ምንም በሳምንትከ1-2 ጊዜ በሳምንትከ3-4 ጊዜ በየቀኑ
ጥ202	ቤተሰብዎ አትክልትና ፍራፍሬ ንክዋና ምግባቸው ጋር በሳምንት ስንት ጊዜ ይመገባሉ?	ምንም በሳምንትከ1-2 ጊዜ በሳምንትከ3-4 ጊዜ በቀንከ1-2 ጊዜ
ጥ203	በቤትዎ በቂየ ልጆች የመጫወቻ ስፍራ አለ?	አዎ የለም
ጥ204	ቤተሰብዎልጁ/ልጅ...የአካልብቃትእንቅስቃሴእንዲያደርጉያበረታታሉ	አዎ የለም
ጥ205	በቤተሰብ ውስጥ ልጆት ቴሌቭዥን እንዳይመለከቱ /ቪዲዮ ጌም እንዳይጫወቱ ገደብ ይጥሉባቸዋል?	አዎ የለም
ጥ206	ለጥ205 መልስዎ አዎ ከሆነ ልጁ/ልጅቷ ቴሌቭዥን እንዲመለከት /ቪዲዮ ጌም እንዲጫወቱ ምን ያህል ጊዜ ይፈቀድላቸዋል?	_____ በሰዓት

ክፍል 3፡የመጠይቁ 3ኛ ክፍል የሚያተኩረው በልጆች የአመጋገብ ሆኔታ፤ አካላዊ እንቅስቃሴ እና ጊዜያቸውን ቁጭ ብለው የሚያሳልፉባቸ ውሁኔታዎች ዙሪያ ነው።

ተ.ቁ	የልጁ/ቷ የአመጋገብ ሁኔታ	መልስ
ጥ301	ልጁ/ልጅቷ በሳምንት ስንት ጊዜ አትክልትና ፍራፍሬ ይመገባል?	ምንም በሳምንት ከ1-2 ጊዜ በሳምንት ከ3-4 ጊዜ በቀንከ 1-2 ጊዜ
ጥ302	ልጅዎ በአብዛኛው ምሳውን የሚያገኘው እንዴት'ነው?	ከት'ም/ቤት መልስ ቤት ይበላል ከቤት ይዞ በመሄድ ት/ቤት ውስጥ ካሉ ካፍቴርያዎች በመግዛት ምሳ አይመገቡም
ጥ303	ልጁ/ልጅቷ በአብዛኛው ጊዜ ለምሳየ ሚበላው/ የምትበላው ምንድን ነው?	እንጀራ/ ዳቦ ከስጋ/ እንቁላልጋር እንጀራ/ ዳቦ ያለስጋ /እንቁላል ሩዝ ወይም ፓስታ ከስጋጋር ሩዝ ወይም ፓስታ ካለስጋ
ጥ304	ልጅ/ልጅቷ በሳምንት ስንት ጊዜስጋ/ ዶሮ/ ዓሳ ይመገባል?	ምንም በሳምንትከ 1-2 ጊዜ በሳምንት ከ3-4 ጊዜ በቀንከ 1-2 ጊዜ
ጥ305	ልጅዎቁርስይመገባል?	አዎ የለም
ጥ306	ለጥ305 መልስዎ አዎ ከሆነ ምን ያህል ጊዜ ይመገባል?	አንዳንድ ጊዜ አብዛኛውን ጊዜ ሁል ጊዜ
ጥ307	ልጁ/ልጅቷ በሳምንት ስንት ጊዜ በዋና ምግቦች መካከል ጣፋጭ ምግቦችን (ኬክ፤ኩኪስ፤አይስክሬም፤ቸኮሌትወዘተ) ይመገባል?	ምንም በሳምንት ከ1-2 ጊዜ በሳምንት ከ3-4 ጊዜ በቀንከ 1-2 ጊዜ
ጥ308	ልጁ/ልጅቷ በሳምንት ስንት ጊዜ ለስላሳ ወይም ጣፋጭ ነገሮችን ይጠጣል?	ምንም በሳምንት ከ1-2 ጊዜ በሳምንት ከ3-4 ጊዜ በቀን ከ1-2 ጊዜ
ጥ309	ልጁ/ልጅቷ ብዙ ጊዜ ጣፋጭ ምግቦችን (ኬክ፤ ኩኪስ፤ አይስክሬም፤ ቸኮሌት ወዘተ) እንዲመገቡ ማድረግ ተገቢ ነው በሚል ይስማማሉ?	በጣም እስማማለሁ እስማማለሁ ገለልተኛ ነኝ አልስማማም በጣም አልስማማም

ጥ310	ልጹ/ልጅቷ ብዙ ጊዜ ለስላሳ /ጠፋጭ መጠጦችን እንዲጠጡ በማድረግ ይስማማሉ?	በጣም እስማማለሁ እስማማለሁ ገለልተኛ ነኝ አልስማማም በጣም አልስማማም
ጥ311	ልጆት የሚማርበት ት/ቤት በቂ የአካል እንቅስቃሴ ቦታ አለ	አዎ የለም
	የልጹ የአካል እንቅስቃሴሀ ኔታ	**መልስ**
ጥ312	ልጅዎ ወደ ት/ቤት በምንድ ነዉ ያሚመላለሱት?	በእግር በሳይክል በመኪና ሌላ ካለ ይገለጽ
ጥ313	በአብዛኛው ልጅዎ የእረፍት ጊዜዉን በምንድ ነዉ የሚያሳልፉት?	በመተኛት በማንበብ ቲቪበማየት ኳስመጫወት ቤተሰብበመርዳት ሌላካለይገለጽ----------
ጥ313	ልጹ/ልጅቷ የአተነፋፈስ ሁኔታን /የልብምት የሚጨምሩ አካላዊ እንቅስቃሴ /ስፖርት ይሰራል/ለች?	አዎ የለም
ጥ314	ለጥ313 መልስዎ አዎ ከሆነ በሳምንት ስንት ቀን እነዚህን እንቅስቃሴዎች /ስፖርትይሰራል/ለች?	ከ 1-3 ቀን ከ4-6 ቀን በየቀኑ
ጥ315	ለጥ313 መልስዎ አዎ ከሆነ ልጅዎ በግምት ለስንት ጊዜ በተከታይ አካላዊ /ስፖርታዊ እንቅስቃሴ ይሰራል/ለች?	ከ 15 ደቂቃበታች ከ 15-29ደቂቃ ከ 30-45 ደቂቃ ከ 46-60ደቂቃ ከ 60 ደቂቃበላይ
ጥ316	ልጅዎ በሳምንት ስንት ሰዓት ትርፍ ጊዜውን/ዋን ቴሌቭዥን በመመልከት /ቪድዮ ጌም በመጫወት ያሳልፋል/ፋለች?	½ ሰዓት 1 ሰዓት 2 ሰዓት 3 ሰዓት ከ 4 ሰዓትበላይ
ጥ317	ልጅዎ በቀንስንት ሰዓት ይተኛል/ለች?	ከ 8 ሰዓትበታች ከ 8-<9 ሰዓት ከ 9-10 ሰዓት ከ 10 ሰዓትበላይ

ክፍል 4፡ ቤተሰብ በሰውነት መጨመር ያላቸው ግንዛቤ

ጥ401	የሰውነት መጨመርየ ጤና ችግር አለው?	አዎ የለም
ጥ402	የሰውነት መጨመር መንስኤውን ያውቃሉ?	አዎ የለም
ጥ403	አዎ ካሉ ምክንያቱን?	የአካል እንቅስቃሴ አለማድረግ ጣፋጭ መጠጥ እና ምግብ ማዘውተር የእንስሳት ተዋጽኦ ማዘውተር ለረጅም ሰአት መተኛት እና መቀመጥ ሌላ ካሉት
ጥ404	የልጆች ሰውነት መጨመር መከላከል ይችላል?	አዎ አይደለም
ጥ405	አዎ ካሉ እንዴት	የአካል እንቅስቃሴ ማድረግ አትክልት እና ፍራፍሬ መመገብ ጣፋጭ መጠጥ እና ምግብ መቀነስ የእንስሳት ተዋጽኦ መቀነስ ሌላ ካሉት

ክፍል 5፡ልጆ በ24 ሰአት ውስጥ ከዚህ በታች የተዘረዘሩት የምግብ አይነቶች ከወሰደ ወይም ከተመገበ አዎ ካልሆነም የለም እያሉ ይመልሱልኛል

ጥ501	ከእህል ዘርየ ተዘጋጁ ምግቦች ከጤፍ፣ ከአጃ፣ ከበቆሎ፣ ከስንዴ፣ ማሽላ፣ ዳጉሳ ምሳሌእንጀራ፣ ዳቦየ መሳሰሉት	የለም አዎ
ጥ502	ከስራስር የተዘጋጁ ምግቦች ክቆቾ ቡላ ከድንች ጎደሬ ካሳቫ ስካር ድንች የመሳሰሉት	የለም አዎ
ጥ503	ከጥራጥሬየተዘጋጁምግቦችባቄላ፤ ሽንብራ፤ አተር፤ አደንጎሬ፣ ምስር፤ አኩሪአተር፣ ለውዝየመሳሰሉት	የለም አዎ
ጥ504	የወተት ተዋጽኦ እንደ ወተት፣ እርጎ፣ እና አይብ የመሳሰሉት	የለም አዎ
ጥ505	የስጋ ውጤቶች እንደ የበሬ ስጋ፣የበግ ስጋ፣የጠቦት ስጋ፣ የፍየል ስጋ፣ የዶሮ ስጋ፣ የመሳሰሉት	የለም አዎ
ጥ506	እንቁላል	የለም አዎ

ጥ507	በቫይታሚን የበለጸጉ አትክልትና ፍራፍሬ ለምሳሌ የፈረንጅ ዱባ፣ ዱባ፣ ካሮት፣ ቢጫማው ስኳር ድንች ማንጎ፣ ፓፓያ፣ አቮካዶ የመሳሰሉት	የለም አሥ

ክፍል 6 ፡የልጁ/ቷአካላዊምዘና

ተ.ቁ	አካላዊ ምዘና		Code
ጥ601	ቁመት	..... (cm)	
ጥ602	ክብደት	..... (Kg)	

አመሠግናለሁ!

Appendix E: Statistical analysis

Variables in the Equation

		B	S.E.	Wald	Df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	EducationalM			5.011	5	.414			
	EducationalM(1)	-.815	1.491	.299	1	.585	.443	.024	8.222
	EducationalM(2)	.510	.731	.488	1	.485	1.666	.398	6.973
	EducationalM(3)	.717	.402	3.177	1	.075	2.048	.931	4.503
	EducationalM(4)	-.269	.444	.367	1	.545	.764	.320	1.823
	EducationalM(5)	-.066	.424	.024	1	.877	.936	.408	2.149
	Catgorincome			6.842	2	.033			
	catgorincome(1)	-1.194	.467	6.538	1	.011	.303	.121	.757
	catgorincome(2)	-.633	.421	2.258	1	.133	.531	.232	1.212
	physically(1)	-1.065	.417	6.509	1	.011	.345	.152	.781
	Games			8.941	2	.011			
	games(1)	-.339	.528	.413	1	.521	.713	.253	2.004
	games(2)	.817	.447	3.338	1	.068	2.263	.942	5.435
	Childeat			8.567	3	.036			
	childeat(1)	-1.175	.583	4.058	1	.044	.309	.099	.969
	childeat(2)	-2.035	.849	5.751	1	.016	.131	.025	.689
	childeat(3)	-1.431	.535	7.153	1	.007	.239	.084	.682
	parentalobesity(1)	2.714	.679	15.992	1	.000	15.089	3.990	57.058
	Child dietdiversity(1)	.485	.920	.278	1	.598	1.624	.268	9.859
	Child sleep(1)	-.042	.285	.022	1	.883	.959	.549	1.675
	Chocolate			6.444	3	.092			
	Chocolate(1)	-.604	.422	2.054	1	.152	.546	.239	1.249
	Chocolate(2)	.218	.514	.181	1	.671	1.244	.455	3.404
	Chocolate(3)	-1.171	1.147	1.044	1	.307	.310	.033	2.933
	Constant	2.156	.935	5.319	1	.021	8.634		

a. Variable(s) entered on step 1: Educational M, catgor income, physically, games, child eat, parental obesity, child dietdiversity, child sleep, Chocolate.