ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
SCHOOL OF ALLIED HEALTH SCIENCE
DEPARTMENT OF NURSING AND MIDWIFERY

PREVALENCE OF CHILDHOOD OVERWEIGHT, OBESITY AND ITS ASSOCIATED FACTORS IN ELEMENTARY SCHOOL CHILDREN IN DIRE DAWA TOWN, EASTERN ETHIOPIA 2016.

BY: ASSEFA DESALEW (BSc, NURSING)

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCE SCHOOL OF ALLIED HEALTH SCIENCE DEPARTMENT OF NURSING AND MIDWIFERY POST GRADUATE STUDIES FOR PARTIAL FULFILLMENT OF THE REQUIREMENT FOR DEGREE OF MASTERS OF SCIENCE IN PEDIATRIC AND CHILD HEALTH NURSING.

JUNE, 2016
ADDIS ABABA, ETHIOPIA

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APPROVAL SHEET

ADDIS ABABA UNIVERSITY

SCHOOL OF NURSING AND MIDWIFERY GRADUATE STUDIES

I hereby certify that I have read and evaluated this Thesis entitled prevalence of childhood overweight, obesity and its associated factors in elementary school children of Dire Dawa Town, Eastern Ethiopia prepared under my guidance by Assefa Desalew. I recommend that it be submitted as fulfilling the thesis requirement.

_____ _____ _____

Advisor Signature Date

As a member of the Board of Examiners of the MSc Thesis Open Defense Examination, I certify that I have read and evaluated the Thesis prepared by Assefa Desalew and examined the candidate. I recommend that the thesis be accepted as fulfilling the Thesis requirements for the degree of Master of Science in Pediatric and Child Health Nursing.

_____ _____ _____

Examiner Signature Date

Final approval and acceptance of the Thesis is contingent upon the submission of its final copy to the Council of Graduate Studies through the Candidate's Department or School Graduate Committee.

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LIST OF ABBREVIATIONS AND ACRONYMS

AAU	Addis Ababa University
AOR	Adjusted Odds Ratio
BMI	Body Mass Index
CDC	Center for Disease Control and Prevention
CI	Confidence Interval
Cm	Centimeter
COR	Crude Odds Ratio
EDHS	Ethiopian Demographic Health Survey
ETB	Ethiopian Birr
ICT	Information Communication Technology
IOTF	International Obesity Task Force
Kg	Kilogram
LMIS	Lower Middle Income School
MPH	Master of Public Health
NGO	Non-Governmental Organization
SPSS	Statistical Package of Social Sciences
TV	Television
UAE	United Arab Emirates
UNICF	United Nation intrnational Children's Fund
UMIS	Upper Middle Income School
WHO	World Health Organization

ABSTRACT

Introduction: The double burden of malnutrition in developing countries is a challenge to people health. Childhood obesity is related to an increased risk of high blood pressure, diabetes, respiratory disease and orthopedic disorders during childhood as well as its adverse effects in adulthood. Obesity in children is increasing worldwide. More than 10 percent children 5 to 17 years of age is obese.

Objective: The overall purpose of this study was to determine the prevalence of childhood overweight, obesity and its associated factors in elementary school children of Dire Dawa town Eastern Ethiopia.

Methods: The study was conducted in Dire Dawa town of Eastern Ethiopia from March 1st to 30th, 2016. School based cross-sectional study design was applied. Participants were selected by multistage sampling. Data was collected using pre-tested self-administered questionnaires, face to face interview and weight and height measurements through trained eight data collectors. Data were coded and entered in epi-data version 3.1 and exported and analyzed using SPSS version 21. Bivariate and multivariate logistic regression models were used to identify factors associated with childhood overweight and obesity. Statistical significance declared at p-value less than 0.05.

Result: A total of 448 children and parents pairs were included in the study. The prevalence of overweight and obesity was (14.7% with 95% CI: 11.70, 18.02) and (5.8% with 95% CI: 3.61, 8.00) respectively. Significant association with overweight and obesity was observed among private school (AOR= 3.44, 95% CI: 1.39, 8.49), high family socioeconomic class (AOR=16.88, 95%CI: 6.48, 23.97), sweet foods preference (AOR = 2.31, 95%CI: 1.04, 5.12), physical inactivity or not engaging in vigirous sport exercise (AOR=3.83, 95%CI: 1.50, 9.80) , sedentary life style like spent free time in viewing television (AOR=3.57, 95%CI: 1.62, 7.86) and play computer game (AOR=4.59, 95%CI: 1.37, 15.37) for more than 6 hours, sleeping habit in afternoon (AOR= 2.58, 95%CI: 1.00, 6.66) and not having close friends(AOR=2.98, 95%CI: 1.43, 6.24).

Conclusion and Recommendations: One out of seven children were overweight and one out of seventeen were obese.Therefore more attention should be given to this childhood problem at each level of stakeholder. Collaboration of the health, education and NGO sectors should be initiated. Creating awareness of the community on healthy diet, physical activates and reducing sedentary behavior through school and public media and other methods should be given emphasis.

Keywords: Obesity, Overweight, Children, Dire Dawa, Ethiopia

CHAPTER ONE
INTRODUCTION

1.1. Background

Obesity and overweight are defined as the abnormal accumulation of body fat, which can entail severe implications for people's health. They represent a severe public health problem, mainly due to the global trend towards increased prevalence rates and the impact they cause in society[1,2]. Worldwide obesity has more than doubled since 1980. In 2014, more than 1.9 billion adults were overweight. Of these, over 600 million were obese. Forty-two million children were overweight or obese in 2013[1].

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 [1,3].

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[4].There are multiple etiologies for this imbalance, hence, the rising prevalence of obesity cannot be addressed by a single etiology[5,6].

Review of the World Health Organization (WHO) health promoting schools framework found this approach improved students' physical activity and fitness, and increased fruit and vegetable intake were protective of childhood obesity[7]. Approximately 50-80 percent of obese children will grow up to become obese adults and it is harder to treat obesity in adults than in children. In children, the development of obesity is associated with the simultaneous deterioration in chronic diseases risk profiles[8,9].

In adults, to define overweight and obesity, Body Mass Index (BMI) cut off points is 30kg/m2 for obesity and 25kg/ m2 for overweight. However, BMI as an index of adiposity is difficult to measure in children compared with adults. Those cutoffs points can not apply for children because of the varying growth rates and maturity levels. There are many organizations that use age and gender specific references for identifying obesity among the youths, such as the WHO standard, the Center for Disease Control and Prevention (CDC) standard, and the International Obesity Task Force (IOTF)[10,11].

Body Mass Index, is also recommended in children with the Cutoff criteria are based on the 2000 CDC BMI-for-age-growth charts for current recommendations of expert committee expressed as percentile[11,12,13]. Center for Disease Control and Prevention Growth charts are an essential screening tool for assessing the nutritional status of Infants, children, and adolescents. They can effectively compare statistics among children of the same age and gender to define overweight and obesity. And used to define overweight and obesity for children and teens between 2 to 20 years of age[14,15]. Accordingly the child whose BMI, less than 5^{th} percentile categories as underweight, between 5^{th} -85^{th} percentile as normal weight, greater than 85^{th} up to less than 95^{th} percentile as overweight and greater than or equal to 95^{th}percentile as obese[15,16,17].

The role of health professionals who provide primary care for children , Parents , schools, and society are in the center of the pediatric obesity epidemic prevention and controlling the health consequence of obesity and overweight is very important[18].

1.2. Statement of the problem

The double burden of malnutrition in developing Countries is a challenge to public health[19,20]. The consequences of obesity in childhood are multiple and led to a progressive increase in morbidity and mortality[21,17]. Childhood obesity increase the risk of high blood pressure, diabetes mellitus, respiratory disease, dyslipidemias, tumors and orthopedic disorders during childhood as well as adverse effects of psychosocial development and academic performance [22,23,24]. The most important long-term consequence of childhood obesity is its persistence into adulthood with all the associated health risks [25,26].

The highest prevalence rates of childhood overweight (25.7%) have been observed in developed countries. However, its magnitude is increasing in developing countries [5,27]. 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 [8,11].

In developing countries, with the reduction of underweight status, there has been widespread concern over the increase in overweight and obesity in children. This results in the simultaneous occurrence of under nutrition and obesity at the childhood level in many developing countries [28,29,30]. In America obesity increased from 5.0% to 18.1% in children and adolescents[14]. In many developing countries, research and investment in health has been mainly devoted to infectious diseases and under nutrition, despite the growing need to address chronic diseases with more effort and resources. Obesity is a well-recognized risk factor for various chronic health problems[31].

In Sub-Saharan Africa, most nutrition efforts have concentrated on under-nutrition among children, and national surveys hardly report on overweight. However, there is growing evidence that childhood obesity is on the rise worldwide, both developed and developing countries [32,33]. A study conducted in Ethiopia reveals that overweight and obesity are emerging among children and high prevalence of overweight (18.2%) was found among students of private schools [34,35,36]. The factors associated with overweight and obesity are complex and include health behaviors, such as eating habits and daily physical activity, and broader social, environmental and biological determinants that influence these health behaviors[37].

Childhood obesity is increasingly being observed with the changing lifestyle of families with increased purchasing power, increasing hours of inactivity due to television, video games, and computers, which are replacing outdoor games and other social activities[38].

Given the tracking of obesity and associated risk factors, childhood is a key developmental period for early identification and prevention of excessive adiposity in adults. Therefore, data on prevalence and associated factors of obesity in developing countries are needed for primary prevention[39]. Although several studies have been conducted in different countries on overweight and obesity among children, a very few studies have been conducted in Ethiopia. However, no study was found during literature review period that had been conducted Dire Dawa Town. Therefore, the purpose of this study is to assess the prevalence of overweight, obesity and its associated factors among elementary school children in Dire Dawa Town, Eastern Ethiopia.

1.3. Significance of the study

This study is designed to measure the prevalence of childhood overweight and obesity and associated factors on childhood overweight and obesity to stimulate planners and researchers on double burden of disease in Ethiopia which is less recognized problem. As a result, this study will have great contribution on designing preventive action of early age overweight and obesity. It will help educational planners, health policy makers, parents or guardians and all other stakeholders to have a clear understanding on magnitude and associated factors of childhood overweight and obesity. On the other hand, enhance health of the children and contributions to the development of the country at large. This study is also used as a base line for researchers to conduct further researches on related issue.

CHAPTER TWO

LITERATURE REVIEW

The prevalence of obesity is increasing throughout the world at an unprecedented rate. Genetic, environmental and developmental factors have been shown to contribute significantly to obesity. Childhood obesity most likely results from an interaction of nutritional, psychological, familial, culture and physiological factors[29,40]. Behavioral interventions, dietary advice, and physical activity were proposed as obesity management strategies[41].

2.1. Prevalence of overweight and obesity

According to Canadian health measure survey in 2009 to 2011 close to one third of children and adolescents, an estimated 1.6 million, were classified as overweight 19.8% and obese 11.7%[37]. A studies in Canada and Iran showed that the prevalence of obesity differed between boys and girls 15.1% and 8.0%, respectively. Among boys who were obese 19.5% was three times more likely obese than girls who were obese 6.3%[42].

A study conducted in London reported that 13.5% of the children were overweight and a further 5.3% were obese[43]. Similarly, A study done in Bangladesh revealed that 29.9% were underweight, 39.1% were normal , 13.2% were overweight and 17.8% were obese[29]. Another study conducted among students at the São Luís Marist School indicated that the prevalence of overweight and obesity was 26.2%, 8.5% respectively[44,45].

A cross section study done in Ontario (Canada) reported that 13.8% of the study participants was overweight, 6.2% of the sample was obese, and 74.7% were normal weight for their age and sex[46]. A study done in Pakistan, in 2012 revealed that 25% students from the upper income group had weight greater than 85 percentile compared to only 4% from the lower middle income[47]. Others study carried out in Italy among 11-15 years school children indicated that boys were more likely to be overweight or obese than girls 28.1% versus18.9%[23].

A study in Southern Brazil among 590 students indicates that prevalence of overweight and obesity was 16.3% and 8.3%, respectively. Boys were more frequently overweight and obese than girls (16.3% and 12.2% versus 16.2% and 5.5%, respectively[40].

According to study undertook in United Arab Emirates among 575 girl and 607 boys' participants aged 8 to 16 years revealed that in girls' overweight cases was 17.6% and 12.9% of obesity. In boys overweight cases was 14.5%, and obesity was 9.6%[10]. In contrast, a study employed in India, revealed that overall prevalence of overweight was 14.3 % among boys and 9.3 % among girls and obesity was 2.9 % in boys and 1.5% in girls. Underweight was 11.1 % in boys and 8.6% in girls[48].Other study done in India revealed that 4.99 % were obese, 17.73% were overweight, 58.67 % were normal weight, 16.16 %were underweight[49].

A study done in Egypt in 2013 among 852 participants reported that 17.7% were overweight, 13.5% were obese children[5]. A study carried out in Cameron indicated that overweight and obesity within the sample population was 14.7% and 2.9% respectively[50].While studies done in Ghana and Uganda found that overweight of 10.4% among girls and 3.2% among boys, and 0.9% and 0.5% obesity among girls and boys, respectively[31].

A study conducted in South Africa indicated that prevalence of obesity in 2010 and 2013 was found 14.9% and 18.5% respectively for both boys and girls[3]. Other study done in South African primary school children revel that the prevalence of obesity was 3.2% for boys and 4.9% for girls, whereas overweight was 14.0% for boys and 17.9% for girls[51]. Other study carried out in Kenya, Overall, prevalence of overweight and obesity was 19.0% (21.0% and 16.8%) among females and males, respectively. Overweight/obesity was significantly higher in private 29.0% than in public schools11.5%[32]. Other study in Kenya indicated that Overweight 23.8% and obesity 8.4% is very high and alarming for both sex. The study also revealed that under nutrition remain high in children that signify the double burden of the problem in developing countries[52].

According to Ethiopian Demographic Health Survey (EDHS) small proportion of children in Ethiopia are classified as overweight or obese. Overall, 2 percent of children below age five years are overweight or obese. There is a positive relationship between mothers' education and level of overweight or obesity[16]. According to a study done in Addis Ababa in 2014 reported that the overall prevalence of underweight, normal, overweight and obesity is 9.5%, 77.8%, 9.9%and 2.8% respectively. Overweight and obesity among private school students was 10.1% and 1.6% respectively; while 4.2% and 0.2% public students were overweight and obese respectively[35].

Other study conducted in Addis Ababa among primary school children revealed that 7.6% and 0.9% of children were overweight and obese respectively. The sex specific prevalence of overweight and obesity were 9.4 and 0.8 for females, 5.4% and 1.1 for boys respectively. Higher overweight found in private school 23.2 %[4]. Similar study carried out in Addis Ababa, in 2013 both overweight and obesity was 5.9%. The overweight prevalence was higher among girls 8.7% than boys 1.6%; while 0.9% girls and none of the boys were obese[34].

2.2. Behavioral factors

2.2.1. Eating habits

According to study undertook in school of Recife in state of Pernambuco, the food preference of the participant revealed that 90.0% mention that is classified as animal product as their preferred food, 88.6% reported food that are rich in carbohydrate, 17.7% listed sweet foods,77.5% and 90.5% of the respondent did not mention at least one vegetable or fruit respectively[44]. According to study done in Pakistan indicates that habit of eating breakfast, 80% from the UMIS sometime eats breakfast as compared to 69% from LMIS regularly eats breakfast[47].

Studies done in European adolescents suggest that plant protein intakes may play a role in preventing obesity and related chronic diseases[53]. While regarding intake of vegetables majority of the students replied with eating vegetables 1–2 times per day[47]. Indian study identified that Chocolate eating habits have more prevalence of obesity and caloric intake is associated with increase in BMI. Where by obese and overweight children were more likely to visit restaurant more than once a week[48]. Other study employed in Lithuania indicated that, Lower meals frequency and breakfast skipping were directly associated with overweight/obesity[54].

A Study carried out in Southern Brazil indicated that vegetables and fruits were consumed less than 4 times per week in 49% and 36.8%, while soft drinks, fast food and sweets were consumed more than 4 times a week by 71%, 70.3% and 42.7%, respectively[40].While studies in Ghana and Uganda indicated about their fruits and vegetables intake, found that less than once a day 28.9%, 73.4% respectively[31]. A significant proportion of overweight and obese children played computer games, High prevalence of obesity/overweight was associated with attending a private school, high level of parental education, playing computer/video games and eating food at the school canteen [32, 25]. In costrast a study done in kenya indicated that vegetarian diet or non-vegetarian diet did not have any effect on prevalence of underweight, overweight and obesity, but

sweet food , beverages and eating meal pattern in front of Television have more prevalence of obesity and overweight than underweight indicates that caloric intake is associated with increase in BMI[52].

According to study done in Gondar, Ethiopia, revealed on consumption of fruits, 18.5% did not, 43.9% one day per week and 37.4% two and more days per week. Regarding vegetable consumption 10%, did not, 59.8% 1-2 days per week, and 29.8% three and more days. Concerning their snack utilization , 17.7% not use, 69.5% used once per day, 9.7% used two times a day and 3% used three and more times a day [34].

A study done in Addis Ababa, Arada sub city, on fruit and vegetable consumption, above half of adolescents 52.6% consumed two and above in a week. Nearly one third 34.4% of adolescents were consume vegetables three or more times per week. Majority, 90.1% of respondents were using snack. More than half of 55.9% of participants were reported that they ate while watching Television[4]. Other study done in Addis Ababa, among 463 participant in indicated on snack that 13.4% did not use , 70.2% use once in a day, 14.5% and 1.9% use twice and three times a day respectively. The food buying habit of the study participant in addition to the regular diet ,71.7% of the respondent bought cake, 80.8% biscuit, 42.5% ice cream and 38.0% chocolate[35].

2.2.2. Physical activity level

A study employed in Ontario, Canada revealed that the time of watching television or play games on computers, 77% students from upper Middle Income School (UMIS) said up to 2 hours daily compared to 63% students from Lower Middle Income School (LMIS). The numbers of hours spend on physical activity like outdoor games were 30 minutes to 2 hours by majority of the students, 73% for UMIS and 49 % for LMIS. Surprisingly 41% students from the LMIS said they do not play any outdoor games [47].

A study carried out in urban elementary school children in Romania indicated that association between overweight and physical activity was not statistically significant. Furthermore, no associations were found significant between overweight and time spent on watching Television or using computer, either in boys or girls[23,24,55,].

A study done in Lithuania indicated that, physical inactivity was not associated with higher BMI[54]. In contrast study done in brazil revealed that children in urban area are more likely to spent time in sedentary behaviors, such as watching television, playing video games and using the computer which had association to obesity[9,56].

According to a study done in Tamale Metropolis in Ghana on assessing the mode by which the children were going to school, 41.0% overweight and 70.0% obese children were more likely to go to school in cars. Playing computer games was utilized as an indicator of sedentary lifestyle and reduced physical activity[25]. Other Studies conducted in Ghana and Uganda indicated that Physical activity less than 60 min per day on at least five days per week for male and female 78.5%, 84.9%. Sedentary behavior 3 hours of more per day 27.1%, 26.9 % respectively. More children in the private schools were obese than government schools 14.5% and 3.0% respectively[31].

Other study in northern Ghana indicated about the leisure time activities, sleeping 1.4%, Television viewing 16.1%, reading 72.9% and football playing 9.6%[57]. Limited physical exercise at home and high levels of sedentary activities are associated with overweight and obesity among urban school children[58]. A study done in Egypt indicates that playing any kind of sport like biking, swimming or football regularly is strongly associated with fewer incidence of overweight and obesity[5]. Children from families who own car was found to be significantly overweight than children from family who do not own car. Children from car owner family were 33 times more likely to be overweight than those who do not own cars. Children with high TV viewing time was higher risk than children with low TV viewing time [59].

According to study done in Gondar Ethiopia, revealed that 43% were engaged in moderate or vigorous intensity work beside learning, 33% did not walk or ride bicycle at least 30 minutes per week, 25.9% walk or ride bicycle at least 30 minutes for 5 or more days per week, 48% do moderate to vigorous intensity sport for at least 10 minutes continuously, however, 15.8% of participants responded that they spent 3 or more hours sitting and watching Television. Most students 80% got to and from school on foot and 20% traveled by car[34].

But less participants in Arada sub city, 29% of adolescents were engaged in works that involve moderate to vigorous intensity activity beside education. Majority 70.1% of adolescents were walking at least 30 minutes in a day. Among adolescents, 45.1% and 39.5% of them were engaged in moderate and vigorous intensity sports respectively[4].

A study conducted in Addis Ababa among 463 study participant on work and sport beside learning , revealed that 52.9% of children did not, but 47.1% participate in moderately for at least 10 minute per day, only 2.6% involved in vigorous activity for at least 10 minute per day. Among children 51.8% walk or ride bicycle, 5-7 day per week, 33.3% for 3-4 days per week, and 8.6% for 1-2 days per week. Regarding sedentary behavior, 17.7% spend less than 6 hours sitting, 56.2% spend 7-8 hours and 26.1% spend 9 hours and more. Accordingly child who do not participate in any work after school were 4.8 times at higher risk than those who do[35].

2.3. Other associated factors for Overweight and Obesity

Among girls loneliness was associated with overweight or obesity. Other psychosocial factors (anxiety, sadness, suicide plan, no close friends,) were risk for overweight or obesity in girls or boys. The obesity and overweight were somewhat more prevalent among children who were having sleeping habit in afternoon [31]. In contrast a study carried out in china revealed that short sleep duration is associated with obesity[60]. Similar study carried out in china school age children revealed that differences in sleep duration, snacking, family income, and were associated with obesity [61]. Children having family history of obesity, gestational hypertension and diabetes were associated to prevalence of obesity and overweight[62,48].

A study employed in European children suggested that association between increased consumption frequencies of foods high in fat, free sugar or salt and long sleep duration related to children's food choices and obesity[63]. Children's overweight or obesity was directly associated with lower paternal education and unemployment[54]. Private school children were 6.8 times at higher risk to overweight than public school[44,45].

A study done in Egypt indicated that socioeconomic class of the family, dietary habits, physical activity and family history of obesity and overweight revealed a significant association between socioeconomic class and BMI, and showed that faulty dietary habits; having more fast food, candy, chocolates, sugary Juices, and carbonated beverage lead to a higher BMI. While having more fresh fruits and vegetables had lower BMI measurement[5]. Overweight, obesity and underweight co-exist among children of school-going age within the Tamale metropolis and socio-economic factors, sedentary lifestyle and high caloric intake are associated with the estimated prevalence rates of overweight, obesity and underweight observed among the children[25].

A study done in Australian children (aged 5 to 15 years), revealed that overweight/obesity was not associated to gender and age [64]. But other study in Brazil on Factors associated with obesity and overweight, Children whose mothers have more than eight years of education have a 1.62 times higher chance of overweight than mothers with eight years or less of education[24]. In contrast among a sample of Ugandan and Ghanaian children aged 13-15 years found a significant association between gender and overweight/obesity [31]. High income showed a significant risk for obesity, parent's education their risk for obesity was higher for those whose parents were both medium educated than those whose parents were both low educated[29].

According to study done in Addis Ababa, small family size , learning in private school and living in male headed household were positively and significantly associated with overweight and/or obesity[4]. Similarly school age children who have family car to come from and go school were more likely to be overweight[35].

2.4. Conceptual Frame-Work

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[4]. According to the literature review the main factors identified are child behavioral factors, economic status of parents, life- style 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. Conceptual frame work are adopted and modified by the investigators after extensive literature review and consult with the experts. The determinant factors were addressed and the relation has been shown as the figure below.

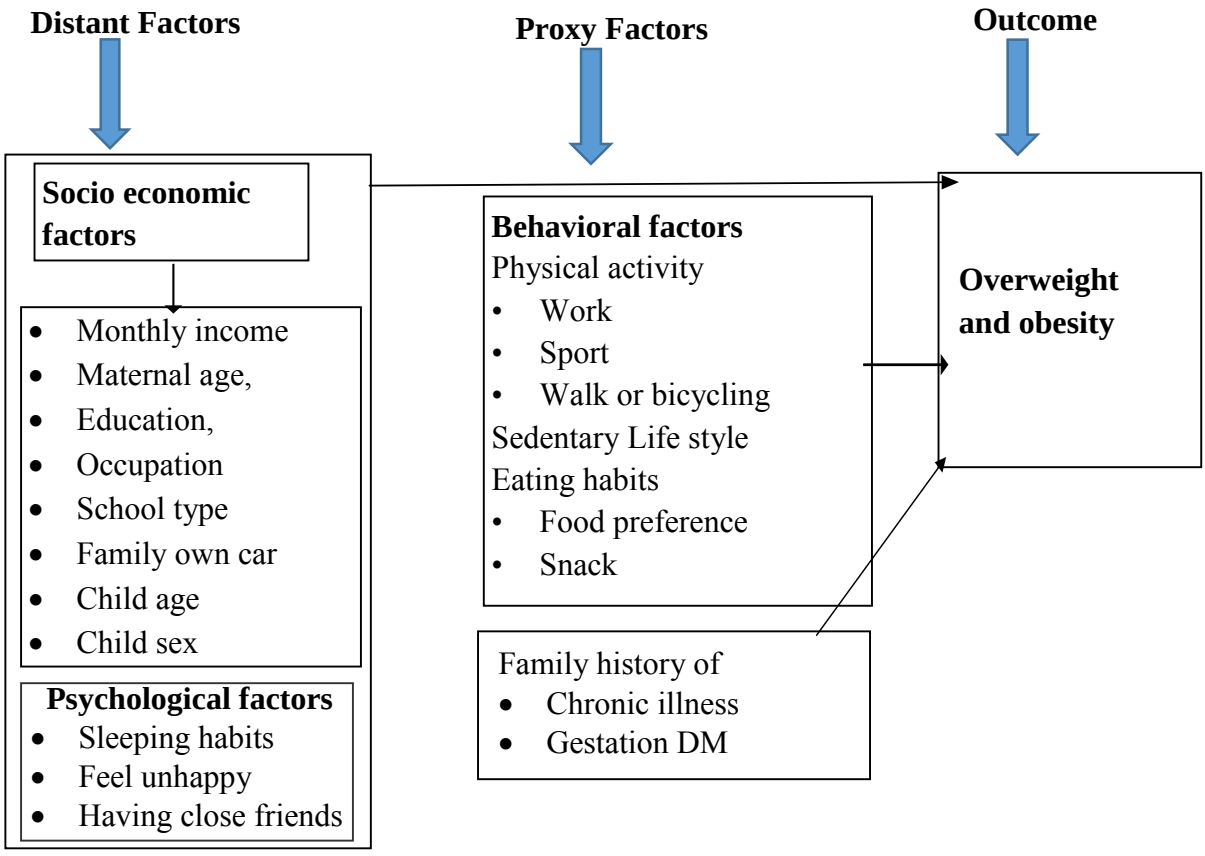

Figure 1: Conceptual Frame-work adopted from different literatures and modified for childhood overweight, obesity and associated factors to among elementary school childern in Dire Dawa Town Eastern Ethiopia 2016.

CHAPTER THREE

OBJECTIVE

3.1. General Objective

- The overall purpose of this study was to determine the prevalence of childhood overweight, obesity and its associated factors in elementary school children of Dire Dawa Town Eastern Ethiopia, March 2016.

3.2. Specific Objectives

1. To determine the prevalence of overweight among elementary school children in Dire Dawa Town.
2. To determine the prevalence of obesity among elementary school children in Dire Dawa Town.
3. To identify associated factors of overweight and obesity among elementary school children in Dire Dawa Town.

CHAPTER FOUR

METHOD AND MATERIAL

4.1 Study Area and period

The study was conducted in Dire Dawa Town from March 1st to 30th, 2016. Dire Dawa is one of the two federal administrative cities in Ethiopia which is found in the eastern part of the country. The town is 515 km far from the capital city of Ethiopia. It has 63 primary schools and 4 high schools. Among the primary schools, 33 of them had grade 1-8th and from these 18 and 15 of them were governmental and private schools respectively. Totally, there are 38376 school age children in the city. Among these, 19135 are males and 19241 are females, according to the Dire Dawa educational office report.

4.2. Study design

School based cross-sectional study was employed using quantitative method.

4.3. Population

4.3.1. Source Population

The source population is all elementary school children living in Dire Dawa town

4.3.2. Study population

All grade 5th to 8th students in selected elementary school.

4.4. Inclusion and Exclusion Criteria

4.4.1. Inclusion criteria

All grade 5th to 8th regular class students, who lived in the city and given assent to participate in this study.

4.4.2. Exclusion criteria

- Subjects having any chronic disease, mental illness and physical disability.
- Night time students
- Students from grade 1st - 4th were excluded in the sample.

4.5. Sample size and sampling technique

4.5.1. Sample size

Sample size was calculated using single proportion sample size calculation formula. By considering proportion of overweight 10% in Addis Ababa elementary school children [35], 95% confidence interval (CI) and 5% marginal error, sample size was calculated as follows:

$n = (Za/2)^2 * p * q / d^2 = \frac{(Z^{a/2})^2\ p\ (1-p)}{d^2}$ n = (1.96)2(0.1) (0.9)/ (0.05)2

n= 138

Considering of 10% non-response rate and design effect 3

The final sample size was (138+14) x3 = 456

Where:

n - Minimum sample size required

p- Estimate of the proportion of the overweight in the population.

d- Margin of error for sample size

Z- The standard normal valve at (100% −α) confidence level, Z=z-value and it was given (1.96)

q=1-p

Based on proportionate to sample size allocation this 456 sample size distributed in to government and private schools.

$= \frac{n'ng}{N}$ Where = ng = Total number of students from selected government schools

np = Total number of students from selected private schools

n' = Calculated sample size

N= total numbers students in both government and private

A. For government schools.

$$\frac{n'np}{N} = \frac{456x18219}{25255} = 329students$$

B .For private schools.

$$\frac{n'nI}{N} = \frac{456x7036}{25255} = 127students$$

4.5.2. Sampling procedure

Multistage sampling method was used to select the study participants. In Dire Dawa Town there are 63 primary schools among these 33 were elementary schools. From these elementary schools a total of 8 schools, 5 from government and 3 from private were selected from the sampling frame by simple random sampling. There were a total of 6587 children in all selected schools and the number of participants from each school were allocated by using probability proportional to size. Then the participants were selected from government and private schools by systematic random sampling method with every K interval of ~14 yleids to final 456 students and 456 parents were included in the study.

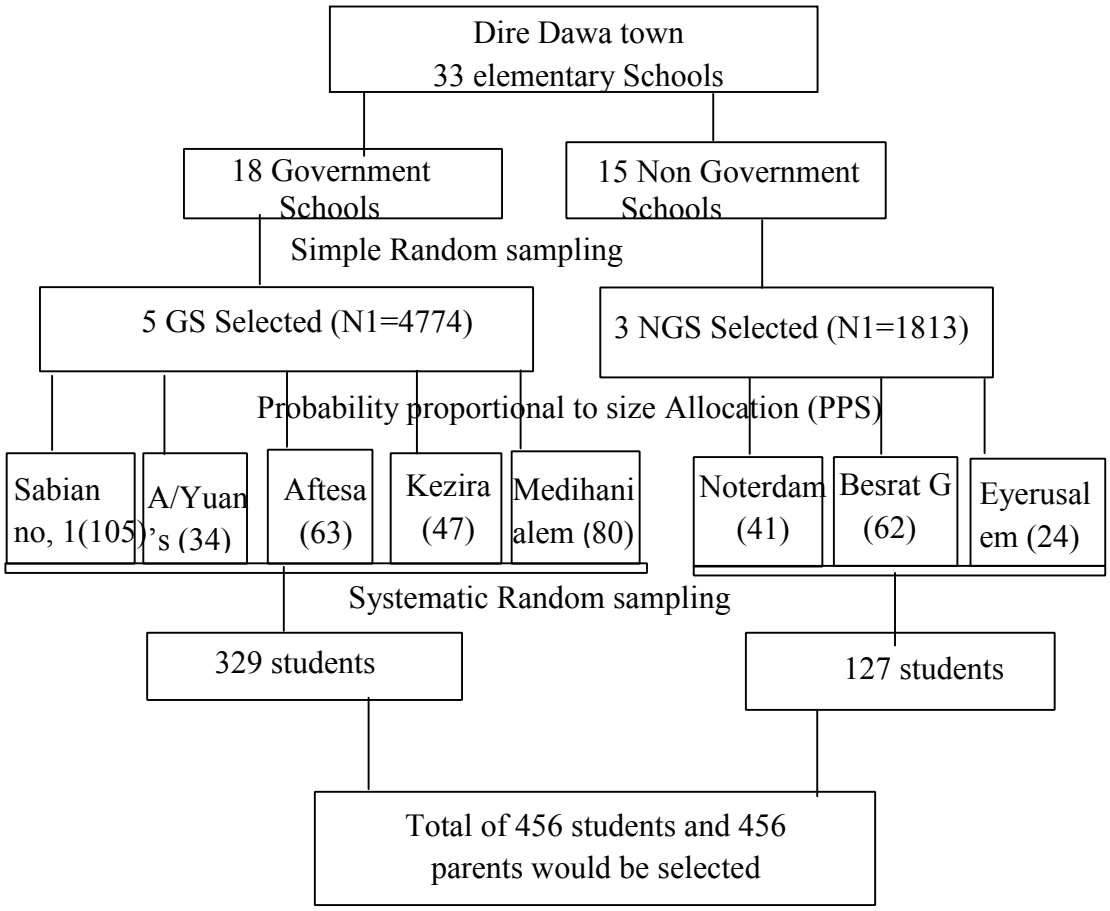

Figure 2: Schematic presentation of sampling procedure to assess childhood overweight, obesity and its associated factors in Dire Dawa Town Eastern Ethiopia 2016.

4.6. Data Collection tool and Procedures

4.6.1 Data collection tools

Semi-structured questionners were used to collect the data. Most of the questionnaires were Adapted and modified from literatures. The questionnaire was first developed in English and then translated in to the local language (Amharic) and review was made by different experts for consistency of translation of the language. Eight sport class room teachers in respective selected schools were selected and trained for one day about the data collection instrument and participated in pretest and data collection. Pretest and demonstration of instrument was performed at EL-betel elementary school this was not included actual sample was done by each data collector.

Socio-demographic variables: family size, family monthly income, education level of mother, ethnicity, possession of car and residential address was collected from student family using self-administered questionnaire. Physical activity and eating habit and sedentary behavior were assessed by interview using questionnaire. Weight was measured by using UNICEF seca digital balance scale and recorded to nearest 0.5Kg. Height was measured using and height measuring board in standing position and recorded to nearest 0.1centmeter respectively.

4.6.2. Data collection procedure

In those schools in which permission given, selection of class and students from each grade level were undertaken. After class selection performed in each school, the data collectors collected data in each selected class. The selected students were asked assent and given parental self-administer questionnaire with consent form to their parent and given their consent to participate in the study. Those students whose parents consented and returned the questionnaire were further interviewed and their height and weight measurements were taken. Data collection procedure was supervised by investigator. The weight and height was measured with barefoot and lighter clothing.

4.7. Variables:

4.7.1. Dependent variables:

Overweight and Obesity

4.7.2. Independent variables:

Socioeconomic variables

Educational status of mother, Family income, maternal history of diabetes mellitus and history of parental chronic illness

Eating habits

Physical activity and sedentary behavior

Sleeping habits

Having close friends

4.8. Operational Definition

1. **Overweight:** BMI for age greater than or equal to 85th percentile but less than 95th percentile (CDC 2000).
2. **Obesity:** BMI for age greater than or equal to 95th percentile (CDC 2000).
3. **Elementary schools:** schools which age having students learning from grade five to grade eights.
4. **Moderate exercise**: Low-impact aerobic exercise classes, brisk walking, recreational team sports (volleyball, etc.)[35].
5. **Vigorous exercise:** Running or jogging, high-intensity aerobic classes, competitive, full-field sports (soccer) or basketball [35].
6. **Normal weight:** BMI for age between 5th to 85th percentiles (CDC 2000).
7. **Underweight:** BMI for age less than 5th percentile (CDC 2000).
8. **Children**: Population that exist in the age group between 11 to 15 years of age

4.9. Data processing and Analysis

Data was coded and entered into epi-data version 3.1 and exported to and analyzed using SPSS version 21. The data was first cleaned both Epi-data and SPSS by running frequency and checking for consistency. Descriptive statistics such as frequencies, percentage, summary measures, tables and graphs were used to describe the results of the respondents. Bi-variable logistic regression model was used to see the association between each independent and dependent variables by estimating crude odds ratio with 95% CI. All independent variables with p-value of $\leq$ 0.2 were

taken into the multivariate analysis. Then the multivariate logistic regression was tested for model fitness by using Hosmer-Lemshow model test. Multicollinearity of the independent variables was checked by standard error and variables with standard error of >2 were dropped from the multivariate analysis. Adjusted odds ratio with 95% CI was estimated to identify the associated factors. Finally statistical significance was declared at p value less than 0.05. Body mass index (BMI) was calculated by; BMI = weight (kg)/height square (M2). After calculating the BMI, the CDC method plots this number on the CDC BMI-for-age growth chart for either boys or girls' growth charts and then places it into a percentile for a child's sex and age. BMI classification was performed as follows:

- Underweight -BMI for Age less than 5th percentile
- Normal weight - BMI for age 5th percentile to less than 85th percentile
- Overweight- BMI for age 85th percentile and above
- Obesity -BMI for age 95th percentile or more

4.10. Data Quality Control

Training: One day training was given for all data collectors, who are sport class room teachers about the objectives, process of the data collection and demonstration of interview through and taking measurement was given for each trainee to reduce enter observer error.

Pretest: The instrument was pretested by 5% of the total sample for clarity, understandability, flow and construction, and those questions found to be unclear or confusing was modified based on the result of pretest.

Calibrations: Weight scale was calibrated at 0 with no object on it and placed in level surface before measurement carry out. Continuous checkup of scales were performed for their reliability.

Supervision: The principal investigator supervised and reviewed every questionnaire for completeness and logical consistency and correction was made. Data coding, entry and cleaning were performed by the principal investigator. The principal investigator collected the completed questionnaires every day and was responsible for the coordination and on spot supervision of overall data collection process.

4.11. Ethical consideration

Ethical approval and clearance was obtained from Addis Ababa University (AAU) College of Health Science, school of Nursing and Midwifery institutional review board. There was no potential risks that may cause any harm on study participants in any form. Letters of cooperation was given and secure at all levels to the respective administrative officials. After obtaining permission from Dire Dawa education office, informed (written) consents was obtained from the parents of study participants. The objective of this study was clearly explained to the study participant prior to take consent. All information obtained from the study participants would be kept private and confidential. Coding and aggregate reporting was used to eliminate names and other personal identification of respondents throughout the study process to ensure anonymity.

4.12. Dissemination of information

The report would be presented to AAU, department of Nursing and Midwifery and the final report will be communicated to respective schools, Dire Dawa city administration, Education Bureau of the town, and other nongovernmental organizations working on child nutrition. The findings will be also presented in different seminars, meetings and workshops and attempt will be made for publication of the research on reputable Journal. Hard and soft copies of the thesis will be made available in the library of AAU for readers.

CHAPTER FIVE

RESULTS

5.1. Parental Socio-demographic Characteristics

A total of 448 children and 448 parents were participated in this study yielding to a response rate of 98.2%. The median age of the mothers was 39 years. The mean (±SD) of average family monthly income was 3014 (±1307.9) Ethiopian birr. About 320 (71.4%) of respondents parents were female and 422 (41.1%) attended primary education. About 176 (39.3%) mothers were house wife and 156 (34.8%) had private business during the last one year prior to the study, 174 (38.8%) were Muslim in religion. Only 41 (9.2%) of them had family own car for transporting their child from school and about 326 (72.8%) of them had less than or equal to five in their family size as shown in table (1).

Table 1: Socio-demographic characteristics of parents among elementary school children in Dire Dawa Town of Eastern Ethiopia March 2016. [n=448]

Variables		**Frequency**	**Percentage**
Respondent sex	Male	128	28.6
	Female	320	71.4
Maternal educational status	No formal education	49	10.9
	Primary level	184	41.1
	Secondary level	145	32.4
	College or University	70	15.6
	Total	448	100.0
Maternal occupation	House wife	176	39.3
	Government employee	116	25.9
	Private business	156	34.8
	Total	448	100.0
Religion	Orthodox	173	38.6
	Muslim	174	38.8
	Catholic	40	8.9
	Protestant	55	12.3
	Others	6	1.3
	Total	448	100.0
Average family monthly income	Below the mean	240	53.6
	Above the mean	208	46.4
Family size	Less than or equal to 5	326	72.8
	Greater than 5	122	27.2
Family own car	Yes	41	9.2
	No	407	90.8

Regarding to maternal history of gestational diabetes mellitus and family history of chronic disease, 11(2.5%) of them reported that their mother had history of gestational diabetes mellitus, and 48(10.7%) one of the parents had chronic disease. Concerning their ethnicity 166(37.1%), 115 (26.0%) and 75(17.0%) were Oromo, Amhara and Somali respectively as shown in Figure (3).

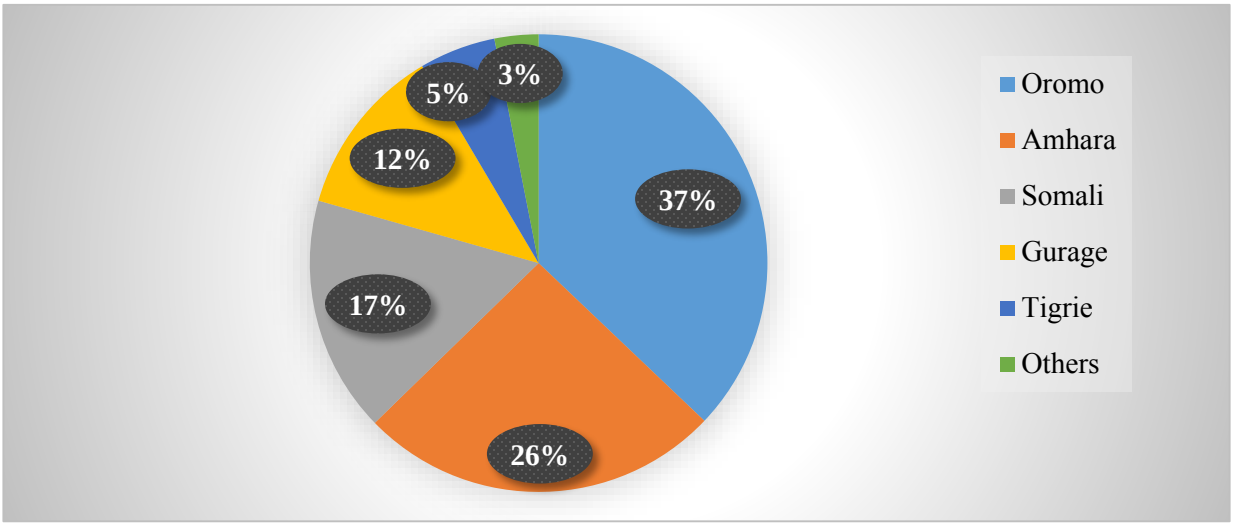

Figure 3: Ethnic distribution of parents of elementary school children in Dire Dawa Town of Eastern Ethiopia March 2016. [n=448]

5.2. Children Socio-demographic characteristics

Among 448 children included in the study, 187(41.7%) and 261 (58.3 %) of them were male and female respectively. The mean and (±SD) of children age was 13.1 (±1.4) years old. Regarding to the child grade level, 115(25.7%), 138(30.8%), 121(27.0%) and 74(16.5%) of the children were grade eighth, grade seven, grade six and grade five respectively. Concerning the school type majority of 325(72.5%) and 123(27.5%) were from government and private school respectively.

5.3. Magnitudes of overweight and obesity

The overall magnitude of underweight, normal weight, overweight and obesity was 54(12.1%), 302(67.4%), 66(14.7% with 95% CI: 11.70, 18.02) and 26(5.8% with 95% CI: 3.61, 8.00) respectively as shown in figure (4).

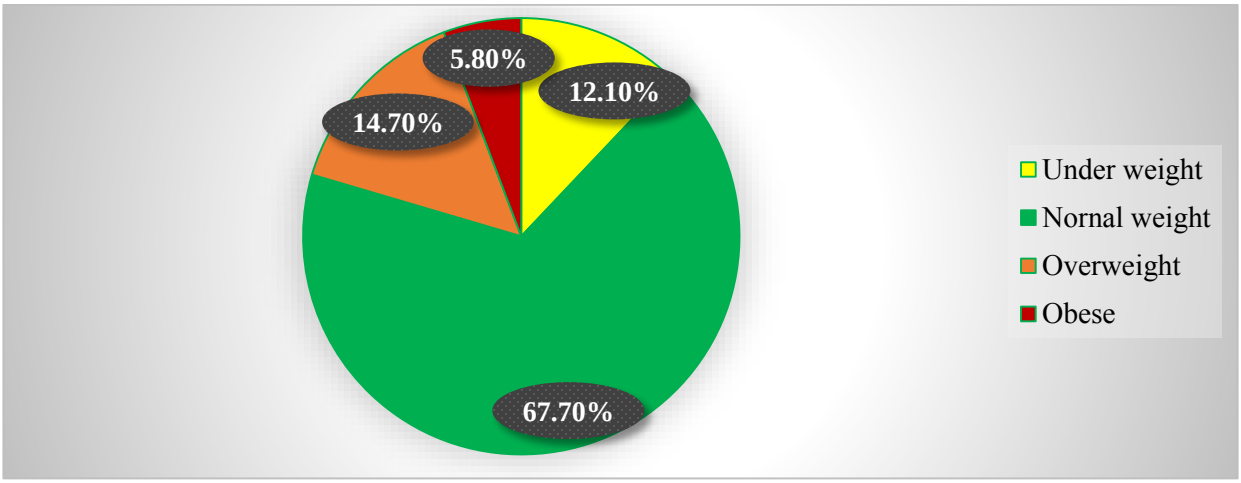

Figure 4: BMI status of Children among elementary school children in Dire Dawa Town of Eastern Ethiopia March 2016. [n=448]

The distribution of overweight and obesity by age, sex, family car ownership and school type depicted in Table (2). Among participants 23(12.3%) and 43(16.5%) were overweight, 16(8.6%) and 10(3.8%) were obese for male and female respectively. According to the distribution shown above girls were more over weight than boys whereas boys were more obese. Regarding their school type and their weight status student from government and private school 30(9.2%), and 36(29.3%) were overweight, 6 (1.8%) and 20 (16.3%) were obese respectively (Table 2).

Table 2: Distribution of Child Body Mass Index by socio demographic characteristic among elementary school children in Dire Dawa Town of Eastern Ethiopia March 2016. [n=448]

Variables		Child Body Mass Index			
		Underweight	Normal weight	Overweight	Obese
Child sex	Male	22(11.8%)	126 (67.4%)	23 (12.3%)	16 (8.6%)
	Female	32(12.3%)	176 (67.4%)	43 (16.5%)	10 (3.8%)
	Total	54 (12.1%)	302(67.4%)	66 (14.7%)	26 (5.8%)
Child age	11 years	12 (18.8%)	43 (67.2%)	9 (14.1%)	0 (0.0%)
	12 years	14 (12.7%)	75 (68.2%)	17 (15.5%)	4 (3.6%)
	13 years	9 (10.6%)	63 (74.1%)	10 (11.8%)	3 (3.5%)
	14 years	12 (13.0%)	57 (62.0%)	13 (14.1%)	10 (10.9%)
	15 years	7 (7.2%)	64 (66.0%)	17 (17.5%)	9 (9.3%)
	Total	54 (12.1%)	302(67.4%)	66 (14.7%)	26 (5.8%)
Grade	Grade five	12 (16.2%)	51 (68.9%)	10 (13.5%)	1 (1.4%)
	Grade six	14 (11.6%)	83 (68.6%)	19 (15.7%)	5 (4.1%)
	Grade seven	17 (12.3%)	90 (65.2%)	20 (14.5%)	11(8.0%)
	Grade eight	11 (9.6%)	78 (67.8%)	17 (14.8%)	9 (7.8%)
	Total	54 (12.1%)	302(67.4%)	66 (14.7%)	26 (5.8%)
Family own car	Yes	0 (0.0%)	13 (31.7%	18 (43.9%)	10 (24.4%)
	No	54 (13.3%)	289(71.0%)	48 (11.8%)	16 (3.9%)
	Total	54 (12.1%)	302 (67.4%)	66 (14.7%	26 (5.8%)
School type	Government	47 (14.5%)	242 (74.5%)	30 (9.2%)	6 (1.8%)
	Private	7 (5.7%)	60(48.8%)	36(29.3%)	20 (16.3%)
	Total	54 (12.1%)	302 (67.4%)	66(14.7%)	26 (5.8%)

5.4. Eating habits and food preference

Dieting habit of participants shows that 176(39.3%) and 170(37.9%) of them did not consume fruits and vegetables respectively. But from those who consume fruits and vegetables, 262 (96.3%) and 268(96.4%) had 1 to 2 serving per day, and the remaining had 3 and more serving of fruits and vegetables per day respectively. Concerning their snack utilization, 246(54.9%) used snack and among those 102(41.5%) used one time, 123(50.0%) two times and 21(8.5%) used three and more times per day. Majority of the respondents 383 (85.5%) had their lunch by carrying lunch box or going to home. Regarding food buying habits 126 (28.1%), 211(47.1%), 80(17.9%), 100(22.3%) and 222 (49.6%) had habits of buying Cake, Biscuit, Ice cream, Chocolate and local foods such as "Baklawa", "Wushebek" or "Halewa" respectively. Only 48 (10.7%) and 126(28.1%) ate while watching move or cinema and Television respectively (Table3).

Table 3: Eating habits and food preference among elementary school children in Dire Dawa Town, Eastern Ethiopia March 2016. [n=448]

Variable		Frequency	Percentage
Fruit consumption per week	Did not consume	176	39.3
	1-2 days per week	203	45.3
	3 and more days per week	69	15.4
	Total	448	100.0
Vegetable consumption per week	Did not consume	170	37.9
	1-2 days per week	215	48.0
	3 and more days per week	63	14.1
	Total	448	100.0
Ways of getting lunch	Home	383	85.5
	School cafeteria	30	6.7
	Nearby food service establishment	35	7.8
Foods buying habits when going to movie or cinema	Yes	48	10.7
	No	136	30.4
	Did not go to movie	264	58.9
Eat while watching TV	Yes	126	28.1
	No	308	68.8
	Did not watch TV	14	3.1
Eat while studying	Yes	48	10.7
	No	400	89.3

Regarding number of meals, Majority 420 (93.8%) of respondent ate 3 and more times per day on the other hand 162 (36.2%) of the students had habits of missing meal schedule. A bout food preference of the respondents, 92.9% preferred food rich in carbohydrate (figure 5).

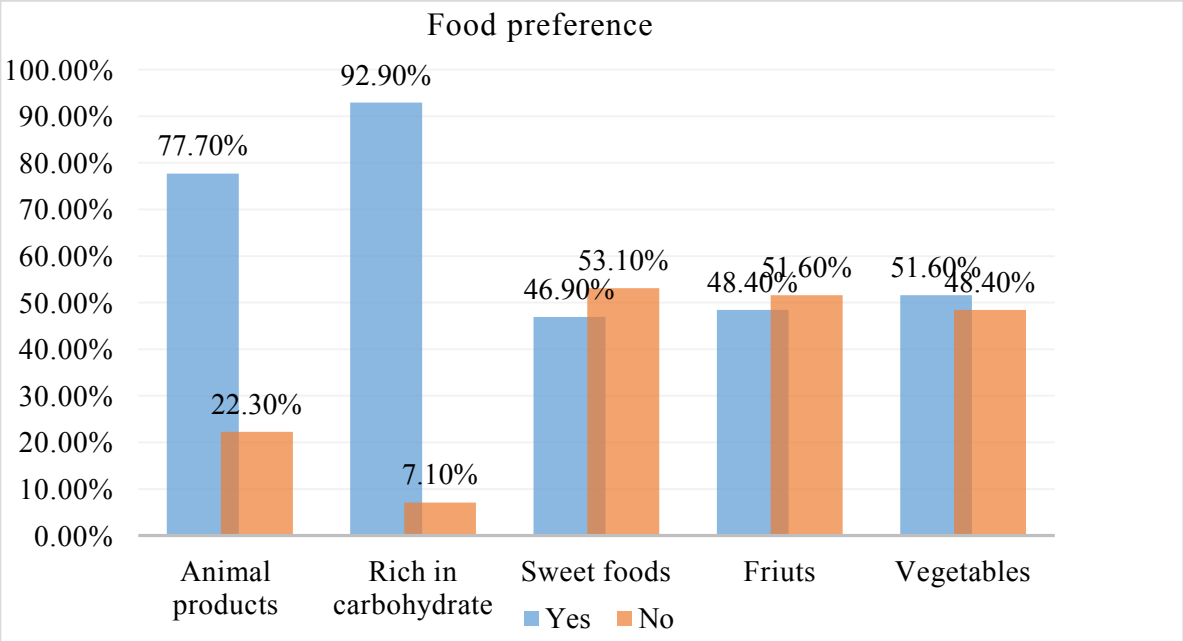

Figure 5: Distribution of food preference of elementary school children in Dire Dawa Town Eastern Ethiopia March 2016. [n=448]

5.5. Physical activity and sedentary life style

Out of 448 participants, 335 (74.8 %) of the children did not participate in any work besides learning. Among children who participate in work, 106 (93.8%) did Vigorous intensity work for at least 10 minutes. While 111 (98.2%) of them participated in moderately intense work for at least 10 minute per day. Regarding the time spending on work, 64 (34.9%), 30(32.6%) and 12 (32.6%) spend in vigorous work for Less than 60 minutes, 60-120 minutes and greater than 120 minutes respectively. While among those participates in moderate intensity work, 59(53.2%), 34(30.6%) and 18(16.2%) spent for less than 60 minutes, 60-120 minutes and greater than 120 minutes respectively. Regarding number of day in particular a week for Vigorous intensity and moderately intensity work depicted in Figure (6).

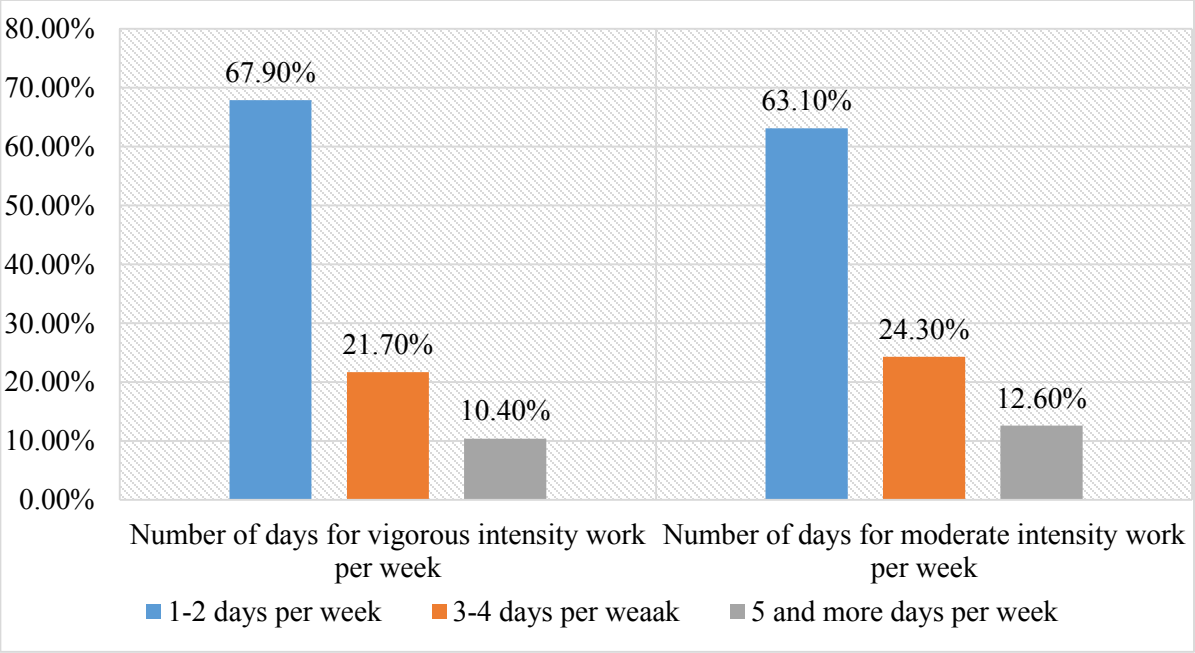

Figure 6: Distribution of number of day for Vigorous and moderately intensity work among elementary school children in Dire Dawa Town Eastern Ethiopia March 2016. [n=448]

Out of 448 participants, 261(58.3%) had habits of walking or ride bicycle. And 91(34.9%) of participant had walking or ride bicycle for 1-2 days per week. Majority, 285(63.6%) of the students did not do vigorous-intensity sports. On the other hand among those who participated in sport, 158(96.9%) of them did moderate-intensity sports. Among those who participate in vigorous sport, half of the students, 83(50.9%) participate in vigorous sport for 1-2 days per week and 71(43.6%) spent for 60 -120 minutes respectively. Concerning sedentary behavior of the participants, 248 (55.4%), 139(31.0%) and 40(8.9%) spent their free time in sitting by reading, watching Television, video and playing computer games respectively. About 172(38.4%) spent sitting for less than three hours, 237(52.9%) spent 3-5 hours and 39(8.7%) spent 6 and more hours per day in sitting (Table 4).

Table 4: Sport activity and sedentary behavior among elementary school Children in Dire Dawa Town, Eastern Ethiopia March 2016. [n=448]

Variables		Frequency	Percentage
Walk or use bicycle for at least 10 minutes	Yes	261	58.3
	No	187	41.7
How many days do you walk or use a bicycle	1-2 days per week	91	34.9
	3-4 days per week	85	32.6
	5 and more days per week	85	32.6
Time spend in walking or bicycling per day	Less than 30 minutes	104	39.8
	30-59 minutes	91	34.9
	60-90 minutes	55	21.1
	Greater than 90 minutes	11	4.2
Vigorous-intensity sports for at least 10 minutes	Yes	163	36.4
	No	285	63.6
Number of days for vigorous - intensity sport per week	1-2 days per week	83	50.9
	3-4 days per week	58	35.6
	5 and more days per week	22	13.5
Time spend doing vigorous - intensity sports per day	Less than 60 minutes	68	41.7
	60-120 minutes	71	43.6
	Greater than120 minutes	24	14.7
Moderate-intensity sports for at least 10 minutes	Yes	158	96.9
	No	5	3.1
Number of days for moderate - intensity sport per week	1-2 days per week	71	44.9
	3-4 days per week	62	39.2
	5 and more days per week	25	15.8
Time spend for moderate - intensity sports per day	Less than 60minutes	64	40.5
	60-120 minutes	70	44.3
	Greater than 120 minutes	24	15.2
Spending free time	Reading books	248	55.4
	Watching TV, video	139	31.0
	Playing computer game	40	8.9
	Others	21	4.7
	Total	448	100.0
Time spend sitting per day	Less than three hours	172	38.4
	3-5 hours	237	52.9
	6 and more hours	39	8.7

Regarding sleeping habits of children majority of them 396(88.4%) did not have sleeping habits in afternoon while about average sleep duration, 24(5.4%), 324(72.3%) and 100 (22.3%) sleep for less than 7 hours, 7-8 hours and greater than or equal to 9 hours per day respectively. Only 46(10.3%) of the students feel unhappy most of the time. But around half of the participants 228(50.9%) have close friends in school or in their neighborhoods.

5.6. Factors Associated with Childhood Overweight and Obesity

5.6.1. Bivariate Analysis

Mothers with occupation status of private business owner were almost 1.8 times more likely to had overweight or obese child compared to those house wife (COR=1.80, 95% CI: 1.06, 3.08). Mothers with the history of gestational diabetes mellitus were around 5 times more likely to had overweight or obese children compared to those mother without history of gestational diabetes mellitus(COR=4.90, 95% CI: 1.46, 16.43). Children who learn in Private School were 6.7 times more likely to be overweight or obese compared to those learnt in government school (COR= 6.7, 95% CI: 4.09, 11.02). About child's fruit and vegetable consumption, those who did not consume fruits were 1.8 times more likely to be overweight or obese compared to those who consumed fruits for 3 and more days per a week (COR=1.80, 95% CI: 1.91, 3.58) and children who did not consume vegetable were almost 3 times more likely, to be overweight or obese compared to those who consumed vegetable for 3 and more day per a week (COR=2.95, 95%CI: 1.31, 6.63) as depicted in (Table 5).

5.6.2. Multivariate analysis

Children who learn in Private School were almost 3 times more likely to be overweight or obese compared to those learnt in government school(AOR= 3.44, 95% CI: 1.39, 8.49). Children who preferred sweet foods were almost 2 times more likely to be overweight or obese compared to those who did not preferred sweet foods(AOR = 2.31, 95%CI: 1.04, 5.12). Children who did not perform vigorous intensity sports were about 4 times more likely to be overweight and obese compared to those who did vigorous intensity sports for at least 10 minutes per activities(AOR=3.83, 95%CI: 1.50, 9.80). Regarding Children who spend their free time by watching TV, video (AOR=3.57, 95%CI: 1.62, 7.86) and Playing computer (AOR=4.59, 95%CI: 1.37, 15.37) were almost 4 times more likely to be overweight and obese compared to those who did not spent in computer or television or video plays (Table 5).

Table 5: Associated factors for childhood overweight and obesity among elementary school children in Dire Dawa Town of Eastern Ethiopia March 2016. [n=448]

Variables		Frequancy	Overweight & Obesity		COR (95% CI)	AOR (95% CI)	P value
			Yes	No			
Maternal occupation	Housewife	176	29	147	1.00	1.00	
	Employee	116	22	94	1.18 (0.64, 2.18)	1.24 (0.49, 3.17)	0.727
	Private business	156	41	115	1.80(1.06,3.08)*	1.16 (0.51, 2.60)	0.881
Family own car	Yes	41	28	13	11.54(5.68,23.48)**	1.10(0.36 ,3.40)	0.864
	No	407	64	343	1.00	1.00	
School type	Gov't	325	36	289	1.00	1.00	
	Private	123	56	67	6.71 (4.08,11.08)**	3.44(1.39,8.49)*	0.007
monthly income	Below the mean	240	6	234	1.00	1.00	
	Above the mean	208	86	122	17.49(11.68,34.71)**	16.88(6.48,23.97)**	0.000
Vigorous-sports	yes	163	9	154	1.00	1.00	
	No	285	83	202	7.03(3.43,14.43)**	3.83(1.49, 9.80)*	0.005
Spend your free time	Reading	269	16	253	1.00	1.00	
	Watching TV, video	139	49	90	8.60(4.66,15.90)*	3.57(1.61,7.86)*	0.002
	Computer Play	40	27	13	22.84(14.28,35.50)*	4.59(1.37,15.37)*	0.013
Sleeping in afternoon	Yes	52	29	23	6.66 (3.62,12.27)**	2.58(1.00,6.66)*	0.049
	No	396	63	333	1.00	1.00	
Having close friends	Yes	228	33	195	1.000	1.00	
	No	220	59	161	2.16(1.35,3.48)*	2.98 (1.43,6.24)*	0.004
Food preference							
Sweets foods	Yes	210	61	149	2.73(1.69, 4.42)**	2.30 (1.04, 5.12)*	0.039
	No	238	31	207	1.00	1.00	
Fruits	Yes	217	38	179	1.00	1.00	
	No	231	54	177	1.44 (0.90, 2.28)	1.23(0.28,5.36)	0.788
Vegetables	Yes	231	41	190	1.00	1.00	
	No	217	51	166	1.42 (0.98, 2.26)	1.26 (0.31, 5.10)	0.742
Snack	Yes	246	58	188	2.13,(1.08,4.19)*	1.57 (0.74,3.31)	0.237
	No	202	34	168	1.00	1.00	
Number of meals per day	<3times	28	9	19	1.00	1.00	
	>=3times	420	83	337	1.92 (0.84, 4.40)	0.77 (0.20 ,2.97)	0.712

*p-value <0.05, **p-value<0.001, CI = Confidence Interval, COR = Crude Odds Ratio, AOR = Adjusted Odds Ratio

CHAPTER SIX

DISCUSSION

6.1. **Discussion**

This study disclosed the magnitudes and associated factors of overweight and obesity among elementary school children in Dire Dawa Town. Accordingly, the overall prevalence of underweight, normal weight, overweight and obesity was (12.1%), (67.4%), (14.7%) and (5.8%) respectively. This study almost consistent with study in Addis Ababa in 2014 reveled that underweight, normal, overweight and obesity is (9.5%), (77.8%), (9.9%) and (2.8%) respectively[35]. Magnitude of overweight was higher in female children (16.5%) than male children (12.3%) but male were more obese (8.6%) than female (3.8%). In addition to this, the prevalence increased as the age of the children increases which was consistent with study in Egypt [5]. The finding was almost similar with the studies done in India from 2007 to 2010 that reveled underweight (16.16%), normal weight (58.67 %), overweight (17.73%) and obesity (4.99 %) [49]. and in Canadian was overweight (13.8%) was obese (6.2%), normal weight (74.7%) none of them were underweight [46].

The finding of this study was lower in magnitude of overweight with study done in Australia reported that (22.1%) of girls and (20.7%) of boys were overweight; but similar in obesity that reveled (5.1%) of girls and (5.8%) of boys were obese [64]. Moreover the finding of this study was also lower than studies done from 2008-2010 in United Arab Emirates and Bangladesh [10, 29]. This may be explained by difference in the life style, socioeconomic status and cultural factors. In this study female was more overweight than male but more male was obese than girls which was consistent with the study in Addis Ababa [4]. However study in Italy among 11-15 years school children indicated that boys (28.1%) was overweight or obese than girls (18.9%)[23].This might be explained by the culture of society in which females spent most of their time at home and more boys' participate in field activities in this country.

The finding of this study was also lower than the studies done in African countries like in Egypt (17.7%) and (13.5%), South Africa (14.9%) and (18.5%) and Kenya (23.8%) and (8.4%) except in Cameron (14.7%) and (2.9%) which is nearly similar in overweight but higher in obesity respectively[3,5,52,50].This might be explained by difference in feeding habits and socio-economic status and difference in standard for the cutoff point and sample size of participants.

However this study was consistent with other study in Kenya, in both studies under nutrition remain high in children that signify the double burden of the problem in developing countries [32]. But this finding was higher than from studies done in 2011 in Ghana and Uganda which was 0.9% and 0.5% obese among girls and boys, respectively [31]. This might be due to the difference in feeding habits, socio-economic status and sample population.

Regarding to school type, about (9.2%), (1.8%) and (29.3%, (16.3%) from government and private school and were overweight and obese respectively. This was consistent with studies in Kenya and Ethiopia, Addis Ababa in 2014. Children from private school were more overweight and obese than from governments' school[4. 32].

While considering about consumption of fruits (45.3%) and vegetable (48.0%) were consumed for 1-2 day per week. Which was consistent with studies done in Southern Brazil in 2015, Ghana and Uganda in 2011 indicated that fruits and vegetables were consumed (36.8%), (49%) and (73.4%) and (28.9%) respectively for less than 4 times per week [40, 31]. Also in Pakistan in 2012 fruits and vegetables were consumed (46%) of the students about 1–2 times per day[47], in Gondar town reveled that fruits and vegetables were consumed (43.9%) and (59.8%) participants and in Addis Ababa, Arada sub city revealed that (52.6%) consumption were for both fruits and vegetables for 1-2 times per week. Regarding the sack utilization (41.5%) used snack one time, (50.0%) two times per day which was comparable with studies done in Gondar and Addis Ababa [4, 34, 35]. The reason for this might be due to similarity in culture and socioeconomic status of the family.

About their food preference, (77.7%), (92.9%), and (46.9%) preferred animal product, food rich in carbohydrate and sweets food which was almost comparable with studies done in state of Pernambuco in 2011, Southern Brazil in 2015 and kenya in 2012 indicated (70.3%), (17.7%), and (37.3%) of participants were preferred sweets food respectively[40,44,52]. Study in Addis Ababa in 2015 about food preference, 90.0% preferred animal product, (88.6%) preferred rich in carbohydrate, and (17.7%) preferred sweet foods, which was similar except higher preference of sweets food were found in this study. This higher sweet food preference might be due to culture of eating locally available sweet foods in the community.

In bivariable analysis, maternal occupational status of private business owner, family possession of own car for transportation, mothers with the history of gestational diabetes mellitus, and children with family history of chronic illness were significantly association with overweight and obesity but the significance decrease in multivariate logistic regression when other confounding variables were controlled.

Vegetable consumption for 3 and more day per week, were found significant association in reducing the risk of overweight or obesity. But when confound were controlled it was not associated. Similarly, those Snack users for 3 and more times per day, getting lunch nearby food service establishments, buying Cake, Ice cream, Chocolate and "Baklawa" "Hallwa" and "Mushebuk" were found more at risk of overweight. But when confounding adjusted in multivariate logistic regression, the association was not statistically significant.

According to this study, Children from Private School were 3 times more likely to be overweight or obese compared to those from government school. This was consistent with studies in different countries from 2011to 2015, in Brazil [44], Indian [45], Kenya [32], Tamale Metropolis Ghana in [25], in Addis Ababa Ethiopian and [4, 35] and in Gondar [34] reveled learning in private schools were more likely to be overweight and obese. One possible explanation might be, their higher socioeconomic status of private school students would allow them for higher adoption of unhealthy nutritional habits (fast food, energy-dense snacks, sweets, more animal products, etc.) than other school students.

This study also found parental average monthly income above the mean were almost 17 times more likely to have overweight or obese children compared to those family who had average monthly income below the mean score which was comparable with studies in China [61], Bangladesh [29], Romania [55], Brazil [24] and in Egypt 2013 [5] reveled that high parental socioeconomic status strongly associated with overweight and obesity. One of the explanation might be those who are from high socio economic status will tend more to adopt westernization life style, that leads to consumption of high fat diet or high calorie content diet and limited physical activities.

Likewise children who preferred sweet foods were more likely to be overweight or obese compared to those who did not preferred sweet foods. This was similar with different studies in European children by WHO [63], Indian [48], Egypt [5], Tamale metropolis of Ghana [25], Kenya [52], Addis Ababa [35] and in Gondar [34] reveled that sweets foods preference were found significantly association with overweight and obesity. This could be explained as sweet food item are calorie dense food which result in positive energy balance to their consumers.

As per to this study, Children who had sleeping habit in afternoon were found 2.5 times more likely to be overweight and obese compared to those who did not sleep in the afternoon. This was consistent with studies in China [61] Ghana and Uganda [31]. But other study in China [60] revealed that short sleep duration and sleeping in afternoon did not associated with obesity. This discrepancy might be due to difference in sleeping habits and age of the sample population. Children who did not had close friends in school or around their neighborhoods were almost 3 times more likely to be overweight or obese compared to those who had close friends. This was consistent with the studies in China [61], Ghana and Uganda in 2011[31].

According to this study children who did not perform vigorous intensity sports were about 4 times more likely to be overweight and obese compared to those who did vigorous intensity sports for at least 10 minutes per activities that participation in vigorous intensity sport were protective factors. This was similar with study done in Brazil [56], Tamale metropolis of Ghana [25], Ghana and Uganda [31] another study in Northern Ghana [57], Egypt [5] and Addis Ababa Arada sub city [4] which was found vigorous intensity sports reduced risk of overweight and obesity. But other studies in Romania [55] and Lithuania [54] reported that any physical activities were not associates with reduction of the risk of increased overweight. This could be explained as physical activity results in energy expenditure thereby decreasing adiposity in the body. Children who did not perform moderate-intensity sports for at least 10 minutes were found to be overweight or obese but the significance decrease in multivariate logistic regression when other confounding variables were controlled.

This study revealed that children who spent their free time by Watching TV, video and playing computer were about 4 times more likely to be overweight and obese compared to those who spent in reading which was consistent with studies done in Brazil [56], Munich Germany [59], Tamale metropolis of Ghana [25], and Ghana and Uganda [31] that revealed Children who spent their free time in viewing television, play computer game for 3 and more hours were more likely to be overweight and obese. And as per this finding Children who spent sitting 6 and more hours per day were more likely to be overweight or obese compared to those who sat for less than three hours per days. This might be explained by advancement in technology change the life style of children. Watching Television and playing computer game may decreased the amount of time spent on Playing Outdoor games which might resulted in gaining extra Weight. That sedentary behaviors was one of the risk factors for childhood overweight and obesity.

6.2. Strength and limitation of the study

Strength

- Mixed method of data collection
- This study have solved some of the methodological limitation of some other studies that use self-report for BMI measurement, but BMI measured by data collectors directly.
- Use of probability sampling for individuals to be selected
- This study was the first in its kind and investigate this is problem in this area, it can serve as a reference and can stimulate professional for further investigation.

Limitation

- Since the study was cross-sectional it may not be strong to demonstrate direct cause and effect relationship between risk factors and outcome.
- During interview there might be social desirability bias by participants.
- Skin fold measurement, which might eliminate limitation of BMI measurement, was not done in this study.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

7.1. Conclusion

Both under nutrition and over nutrition coexist in primary schools children in Dire Dawa town. This study revealed that a high prevalence of overweight (14.7%) which means one in seven children) and obesity (5.8%) one in seventeen children. The magnitude of childhood overweight and obesity was found to be high. More female were overweight than boys. Nevertheless more boys were obese than girls. Children from private schools were more overweight and obese than government schools that surprisingly high from study done in Ethiopia and was comparable with other African and western countries. This study found overweight and obesity was hidden problem of children in Dire Dawa. Among the associated factors for childhood overweight and obesity learning in private school, high parental socioeconomic class, sweet foods preference, physical inactivity or not engaging in sport exercise, sedentary life style like spent free time in viewing television and play computer game for more than 6 hours, sleeping habit in afternoon and not having close friends were identified as positively significant associated factors with the BMI of students. This result indicate that if preventive action is not taken immediately, prevalence of overweight and obesity among children, might increase rapidly.

7.2. 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 the community needs to be mobilized. So everybody needs to be aware of the risk factors. Based on the finding of this study the following recommendation 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, since these can result with multiple health effect and treating the consequences of overweight and obesity effectively is limited.
- Initiation of the preventive measures to be integrated in the national health extension program to reaching the whole community.

Dire Dawa education and health office

- The health office should initiate awareness through publications and mass media and prepare short course trainings to health extension workers and school teachers and community leaders on preventive measures like health dieting, increasing the physical activities.
- School based preventive program should be set, which can actively participate childern, child family, and the school staffs by giving priority to private schools should be considered.
- The health office should work in collaboration with the education office, other sectors and NGOs to increase awareness on the importance of prevention measures.

Researchers

- To undertake more comprehensive research to determine more risk factors specially to investigate the local available sweet foods about the nutritional value and the genetic factors.

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.

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ANNEXES

Annex I: Consent form

Written consent form for child parents

Participant Information Sheet

Good morning/ afternoon?

My name is _____. Currently I am a graduate student at Addis Ababa University, College of Health Science, School of Allied Health Science, Department of Nursing and Midwifery. And now I am conducting a research on prevalence of childhood overweight and obesity and associated factors among school age children in Dire Dawa town.

Objective: To determine the prevalence of childhood overweight and obesity and its associated factors in Elementary school children of Dire Dawa Town Eastern Ethiopia in February 2016.

You are selected randomly as a possible participant in this study as a subject.

Potential risks: There is no potential risks that may cause any harm on study participants.

Benefits: No financial benefits are related with this study. But by participating in this study, you contribute to improve the prevention and control method of childhood overweight and obesity.

Confidentiality: 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 10 minutes.

Contact Address of the Principal Investigator

Name: Assefa Desalew Fentaw

E–Mail: Assefad100@gmail.com

Cell –Phone: +251-913 -083613

Written consent form for child parents

Addis Ababa University, College of Health Science, School of Allied Health Science, department of Pediatrics and Child Health nursing.

I have read and understand all about the objective and the process of the study. My participation is voluntary and not obligate to answer any question which I do not know or do not wish to answer. I also understood that all information given by me and my child will be kept strictly confidential. Therefore I am willing to participate in this study.

Study participant sign _____date_____

Data collector sign _____date_____

Contact Address of the Principal Investigator

Name: Assefa Desalew Fentaw

E–Mail: Assefad100@gmail.com

Cell –Phone: +251-913 -083613

Annex II: Questionnaires English Version

Addis Ababa University, College of Health Science, School of Allied Health Science, department of Pediatrics and Child Health nursing.

This questionnaire is designed to collect information from respondents in respect to determine prevalence and associated factors of overweight and obesity among elementary school children in Dire Dawa town.

Part I: Questionnaire for Overweight /Obesity and associated Factor Surveillance to be filled by student family.Participant code_____

S , no	**Demographic information**	**Response**	**skip**
101.	Maternal age	_____	
102.	Family respondent sex	1. Male 2. Female	
103.	Religion	1. Muslim 2. Orthodox 3. catholic 4. protestant 5. other_____	
104.	What is the occupation of the Mothers?	1. House wife 2. Government Employee 3. Private Business	
105.	Ethnicity	1. Oromo 2. Amhara 3. Somali 4. Gurage 4. Tigre 5. other_____	
106	What is the highest level of maternal education you have completed?	1. No formal education 2. 1-4 grade 3. 5-8 grade 4. 9-10 grade 5. 11-12 grade 6. College/ university	
107.	How many people live in your household?	_____	
108.	What is the average estimated monthly earning of the family in birr?	_____	
109.	Is there vehicle to transport family from place to place?	1. Yes 2. No	
110.	Have you ever been diagnosed pregnancy related Diabetes Mellitus in any of your pregnancy? (only for female respondents)	1. Yes 2. No	

Verbal assent form for students

Good morning/ afternoon?

My name is _____. Currently I am a graduate student at Addis Ababa University, College of Health Science, School of Allied Health Science, Department of Nursing and Midwifery. And now I am conducting a research on prevalence of childhood overweight and obesity and associated factors among school age children in Dire Dawa town.

Objective: To determine the prevalence of childhood overweight and obesity and its associated factors in Elementary school children of Dire Dawa Town Eastern Ethiopia in February 2016.

You are selected randomly as a possible participant in this study as a subject. I would like to ask you a few questions about your personal characteristics, you're eating habit, and your physical exercise, your willingness for weight and height measurements.

Potential risks: There is no potential risks that may cause any harm on study participants.

Benefits: No financial benefits are related with this study. But by participating in this study, you contribute to improve the prevention and control method of childhood overweight and obesity.

Confidentiality: You and your family 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 family 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 interview will take about 30 minutes and weight and height measurement will take 10.

Interviewer sign _____date_____code_____

Contact Address of the Principal Investigator

Name: Assefa Desalew Fentaw

E–Mail: Assefad100@gmail.com

Cell –Phone: +251-913 -083613

Part II; Questionnaire for Overweight and obesity and associated Factor Surveillance for students

Participant code _____ Kebele---------- Name of the school ---------

Sociodemography of the children, Location and type of school			
Question		**Response**	**skip rule**
201.	**Sex**	1. Male 2. Female	
202.	Age	_____	
203.	Type of school	1. Government 2. private	
204.	Grade	_____	

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**	**skip rule**
205.	In a typical week on how many days do you eat fruit?	_____	If zero go to Q 207
206.	How many **serving** of fruit do you eat on one of those days?	_____	
207.	In a typical week on how many days do you eat vegetables?	_____	If zero go to Q 209
208.	How many servings of vegetables do you eat on one of those days?	_____	
209.	List up to five foods you like most	1. ---------- 2. ---------- 3. ---------- 4. ---------- 5. ----------	
210.	Do you ever have a snack?	1. Yes **2.** No	if no go to Q 212
211.	How many times a day do you have snack?	_____	
212.	How many meal do you have a day other than snacks?	_____	
213.	How do you get your lunch?	1. Home 2. School cafeteria 3. Nearby food service 4. I did not use lunch	

214.	Which foods that you ever bought in addition to the regular meal	1. Cake 2. Biscuit 3. Ice cream 4. Chocolate 5. Others specify_____	
215.	Do you buy foods when you go to movies or cinema?	1. Yes 2. No 3. I did not go movies	
216.	Do you eat While you Watch television?	1. Yes 2. No 3. I did not watch television	
217.	When you study do you eat food?	1. yes 2. No	
218.	Do you have habit of missing any of your meal schedules?	1. Yes 2. No	

Physical activity

Below this you will be asked about time you spend doing different physical activities in a typical week. Activity at work

Question		**Response**	**Skip rule**
219.	Do you engaged in Work besides your education?	1. Yes 2. No	If no go to Q 226
220.	If your answer in Q 219 is yes does your work involve vigorous intensity activity that for at least 10 minutes continuously?	1. Yes 2. No	If no go to Q 226
221.	In a typical week on how many days do you do vigorous –intensity activities as part of your work?	Number of days _____	
222.	How much time do you spend doing vigorous – intensity activities at work on a typical day?	Hours: minutes _____	
223.	Does your work involve moderate-intensity activity,	1. yes 2. No	If no go to Q 226
224.	In a typical week on how many day do you do moderate –intensity	----------	
225.	How much time do you spend doing Moderate – intensity activities at work on a typical day?	Hours: minutes ----------	
226.	Do you walk or use a bicycle for at least 10 minutes continuously to get to and from places?	1. Yes 2. No	If no go to Q 233
227.	In a typical week on how many days do you walk or use a bicycle for at least 10 minutes continuously	_____	
228.	How much time do you spend walking or bicycling for travel in a typical day?	Hours: minutes _____	

229.	Do you do any vigorous-intensity sports for at least 10 minutes continuously?	1. Yes 2. No	If no go to Q 234
230.	If yes Q229, In a typical week on how many days do you do vigorous –intensity sports, fitness activities?	_____	
231.	How much time do you spend doing vigorous – intensity sports, fitness or recreational activities in a typical days?	Hours: minutes _____	
232.	In a typical week on how many days do you do moderate –intensity sports, fitness activities?	_____	
233.	How much time do you spend doing moderate – intensity sports, fitness or recreational activities in a typical days?	Hours: minutes_____	
Sedentary behavior			
234.	How do you spend your free time?	1. Reading books 2. Watching TV, video 3. Playing on computer games 4. Others specify)_____	
235.	How much time do you usually spend sitting on a typical day?	Hours: minutes_____	
236.	Is there same one in your family who have chronic disease like (diabetes mellitus hypertension, arthritis etc.)	1. Yes 2. No	
237.	Is there same one in the family who overweight /obesity	1. Yes 2. No	
238.	Do you have sleeping habit in afternoon	1. Yes 2. No	
239.	Average Sleep duration in particular day	Hours _____	
240.	Do you feel unhappy most of the time	1. Yes 2. No	
241.	Do you have close friends in school or neighbors	1. Yes 2. No	

Part III: Questionnaire for Overweight and obesity and associated Factor Surveillance for Physical Measurements to be filled by data collectors

measurements		**Response**	**Skip rule**
242.	Height	In centimeters _____	
243.	Weight	In kilograms (Kg) _____	
244.	BMI		

Annex III. Amharic version of the questioner

አዲስ አበባ ዩኒቨርስቲ ጤና ሳይንስ ኮሌጅ የነርሲንግ እና አዋላጅ ትምህርት ክፍል ከጤና ጋር የተያያዘ ጥናታዊ ፅሁፍ የተሳታፊዎች መረጃ መስጫ ቅጽ

Amharic version of Participant Information Sheet

እንደምን አደሩ/ዋሉ?

----------እባላለሁ፡፡ በአዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ ነርሲንግና ሚድዋይፍሪ ትምህርት ክፍል በህፃናት ጤና የ2ኛ ዓመት የማስትሬት ድግሪ ተመራቂ ተማሪ ነኝ፡፡ በአሁኑ ሰዓት በድሬ ዳዋ ከተማ ከአምስተኛ እስከ ስምንተኛ ክፍል ለሚማሩ ተማሪዎች እና ወላጆችቻቸዉ ስለ ክብደት መጨመር እና ለክብደት መጨመር ተያያዥነት ያላቸዉን ነገሮች ለመለየት በማጥናት ላይ እገኛለሁ፡፡

የጥናቱ አላማ፡ የልጆች የክብደት መጨመር እና ለክብደት መጨመር ተያያዥነት ያላቸዉን ነገሮች ለመለየት ነዉ፡፡

የጎንዮሽ ጉዳት፡ በዚህ ጥናት መሳተፍ በርሶዎም ሆነ በልጅዎ ላይ ምንም አይነት ጉዳት አያመጣም፡፡

ጥቅማ ጥቅም፡ በዚህ ጥናት መሳተፍ ምንም አይነት ገንዘብ አያስገኝም፡፡ ከአንተ\ች የምናገኘዉ መረጃ ከልጆች ክብደት መጨመር ጋር ተያይዘዉ የሚመጡ የልጆችን የጤና ችግሮች ለመከላከል፣ እቅድ ለማዉጣት ይረዳል። ስለዚህ ይህንን አስመልክቶ የተወሰኑ ጥያቄዎችን ልጠይቅዎት እወዳለሁ፡፡ የእርስዎ በእውነት ላይ የተመሰረተ መልስ ለዚህ ጥናት መሳካት አስተዋፅኦ ያደርጋል፡፡ እርስዎም የሚሰጡት መረጃ ከአጥኚውና ቃለመጠይቅ አድራጊው በስተቀር በማንኛውም መልኩ ለሌላ 3ኛ ወገን ተላልፎ አይሰጥም፡፡ በሙሉ ፈቃደኝነት እንዲሳተፉ እየጠየቅሁ ያለመሳተፍ ወይም በማንኛውም ጊዜ ራስዎን ከጥናቱ የማግለል ሙሉ መብት አለዎት፡፡በማንኛውም ጊዜ ጥያቄ ካለዎት በሚከተለው አድራሻዬ ማግኘት ይችላሉ፡፡ጥያቄዎችን ለመመለስ አስር ደቂቃያህል ጊዜ ያስፈልጋል፡፡

የስምምነት መግለጫ ፎርም

አዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ ነርሲንግ ዲፓርትመንት ድህረ ምረቃ ፕሮግራም

እኔ ስሜ ከዚህ በታች የተገለፀው፣ የዚህ ጥናት ዓላማ በደንብ የተብራራልኝ ሲሆን የጥናቱንም ዓላማ ተረድቻለሁ፡፡ በዚሁ ጥናት ላይ መሳተፍ በሙሉ ፈቃደኝነት ላይ የተመሰረተ መሆኑን በሚገባ የተረዳሁ ሲሆን በማንኛውም ጊዜ ከጥናቱ ራሴን የማግለል መብት እንዳለኝ አውቄአለሁ፡፡ ስለሆነም የምሰጠው መረጃ እስከተጠበቀ ድረስ በዚህ ጥናት ለመሳተፍ ተስማምቻለሁ፡፡ በዚህ ጥናት ለመሳተፍ ስምምነቴን ስገልፅ ለምጠየቀው ጥያቄ በእውነት ላይ የተመሰረተ መልስ ለመስጠት የተስማማሁ መሆኔን አረጋግጣለሁ፡፡

የመረጃ ሰጪው ፊርማ _____ **ቀን** _____

የአጥኚው ፊርማ _____**ቀን** _____

<u>ጥናቱን የሚያካሂደዉ ግለሰብ አድራሻ</u>

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የልጆች የክብደት መጨመር እና ለክብደት መጨመር ተያያዥነት ያላቸዉን ነገሮች ለመለት በተማሪ ወላጅ ወይም አሳዳጊ የሚሞላ ቅጽ

የሚከተሉትን ጥያቄዎች በጥንቃቄ ከነበቡ በኋላ ለእያንዳንዱ ጥያቄ በተሰተዉ መልስ መስጫ ቦታ መልሱን ይሙሉ::

የተሳታፊ መለያቁጥር----------ቀበሌ----------ሰፈር----------

ተ.ቁ.	ጥያቄ	መልስ	ዝለል
101.	የእናት እድሜ	----------	
102.	መልስ የሰጠዉ ሰዉ □□	1. ወንድ 2. ሴት	
103.	የእናት ስራ ድርሻ	1. የቤት እመቤት 2. የመንግስት ሰራተኛ 3. የግል ንግድ(ስራ)	
104.	ሀይማኖት	1. ኦርቶዶክስ 2. ሙስሊም 3. ካቶሊክ 4. ፕሮቴስታንት 5. ሌላ ካለ ይጠቀስ……..	
105.	ብሔረሰብ	1. ሶማሌ 2. ኦሮሞ 3. አማራ 4. ጉራጌ 5. ትግሬ 6. ሌላ ካለ ይጠቀስ……..	
106.	የልጁ/ቷ እናት የትምህርት ደረጃ	1. መደበኛ ትምህርት አልተከታተሉም 2. ከ 1 እስከ 4ኛ ክፍል 3. ከ 5 እስከ 8ኛ ክፍል 4. ከ 9 እስከ 10ኛ ክፍል 5. ከ 11 እስከ 12ኛ ክፍል 6. ኮሌጅ ወይም ዩኒቨርሲቲ ትምህርት አተናቅቄያለሁ	
107.	እርሶዎን ጨምሮ የቤተሰብ ብዛት ስንት ነዉ?	----------	
108.	በአማካኝ የቤተሰብ የወር ገቢ በድምር ስንት ብር ይሆናል?	----------	
109.	ቤተሰብ የሚጠቀምበት የግል መኪና አለ?	1. አዎ 2. የለም	
110.	ካሁን በፊት ባደረጉት እርግዝና በእርግዝና ወቅት የሚከሰት የስኳር በሽታ ተይዘዉ ያዉቃሉ?	1. አዎ 2. የለም	

አዲስ አበባዩኒቨርስቲ ጤና ሳይንስ ኮሌጅ የነርሲንግ እና አዋላጅ ትምህርት ክፍል ከጤና ጋር የተያያዘ ጥናታዊ ፅሁፍ የተሳታፊዎች መረጃ መስጫ ቅጽ

እንደምን አደሩ/ዋሉ?

----------እባላለሁ፡፡ በአዲስ አበባ ዩኒቨርሲቲ ጤና ሳይንስ ኮሌጅ ነርሲንግና ሚድዋይፍሪ ትምህርት ክፍል በህፃናት ጤና የ2ኛ ዓመት የማስትሬት ድግሪ ተመራቂ ተማሪ ነኝ፡፡ በአሁኑ ሰዓት በድሬ ዳዋ ከተማ ከአምስተኛ እስከ ስምንተኛ ክፍል ለሚማሩ ተማሪዎች እና ወላጆችቻቸዉ ስለ ክብደት መጨመር እና ለክብደት መጨመር ተያያዥነት ያላቸዉን ነገሮች ለመለየት በማጥናት ላይ እገኛለሁ፡፡

የጥናቱ አላማ፡ የልጆች የክብደት መጨመር እና ለክብደት መጨመር ተያያዥነት ያላቸዉን ነገሮች ለመለየት ነዉ፡፡

የጎንዮሽ ጉዳት፡ በዚህ ጥናት መሳተፍ በርሶም ሆነ በቤተሰበዎ ላይ ምንም አይነት ጉዳት አያመጣም፡፡

ጥቅማ ጥቅም፡ በዚህ ጥናት መሳተፍ ምንም አይነት ገንዘብ አያስገኝም፡፡ ከአንተ\ች ና ከቤተሰብህ\ሽ የምናገኘዉ መረጃ ከልጆች ክብደት መጨመር ጋር ተያይዘዉ የሚመጡ የልጆችን የጤና ችግሮች ለመከላከል እቅድ ለማዉጣት ይረዳናል። በዚህ መጠይቅ የአመጋብ ልምድ ሰለአካላዊ እንቅስቃሴ በመቀመጥ የምታሳልፈዉን\ፊዉን ጊዜ በተመለከተ እጠየቅህአለሁ\ሻለሁ። ከዚህ በተጨማሪ የአንተን\ችን ክብደት ና ቁመት መጠን እንለካለን። የአንተን\ችን በእውነት ላይ የተመሰረተ መልስ ለዚህ ጥናት መሳካት አስተዋፅኦ ያደርጋል፡፡ አንተን\ችን የምሰጠዉ/ጨዉ መረጃ ከአጥኚውና ቃለመጠይቅ አድራጊው በስተቀር በማንኛውም መልኩ ለሌላ 3ኛ ወገን ተላልፎ አይሰጥም፡፡ በሙሉ ፈቃደኝት እንዲሳተፉ እየጠየቅሁ ያለመሳተፍ ወይም በማንኛውም ጊዜ ራስዎን ከጥናቱ የማግለል ሙሉ መብት አለዎት፡፡በማንኛውም ጊዜ ጥያቄ ካለዎት በሚከተለው አድራሻዬ ማግኘት ይችላለ፡፡ጥያቄዎችን ለመመለስ 30 ደቂቃ ያህል ጊዜ ያስፈልጋል፡፡

<u>ጥናቱን የሚያካሂደዉ ግለሰብ አድራሻ</u>

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የልጆች የክብደት መጨመር እና ለክብደት መጨመር ተያያዥነት ያላቸዉን ነገሮች ለመለየት በተማሪ ሚሞላ ቅጽ

የሚከተሉትን ጥያቄዎች በጥንቃቄ ከነበቡ በኋላ ለእንዳንዱ በተሰተዉ መልስ መስጫ ቦታ መልሱን ይሙሉ::

የተሳታፊ መለያ ቁጥር----------ቀበሌ----------የትምህርት ቤቱ ስም ----------

የተማሪዎች መግለጫ፣የትምህርት ቤቱ ይዞታ			
ጥያቄ		**መልስ**	**ዝለል**
201.	ጾታ	1. ወንድ 2. ሴት	
202.	እድሜ	----------	
203.	የትምህርት ደረጃ	----------	
204.	የትምህርት ቤቱ አይነት	1. የመንግስት 2. የግል 3. መንግስታዊ ያልሆነድርጅት 4. የመስጊድ/የቤተክርስቲያን/ካቶሊክትምህርት	

ከባህሪ ጋር የተየያዙ ጥያቄዎች፡ የአመጋገብ ልምድ

ከዚህ ቀጥሎ ባለፈዉ አንድ ዓመት አዘዉትረዉ ስለተመገቡአቸዉ አትክልት ና ፍራፍሬዎችን በተመለከተ እጠይቅዎታለሁ::

ጥያቄ		**መልስ**	**ዝለል**
205.	አብዛኛዉን ጊዜ በአንድ ሳምንት ዉስጥ ስንት ቀን ፍራፍሬዎችን ይመገባሉ?	በሳምንት_____ቀን	ምንም ከሌለ 0 ይሞላ... ወደጥያቄ207ይህዱ
206.	ፍራፍሬ ከሚመገቡባቸዉ ቀናት ዉስጥ በአንዱ ቀን እነዚህን ፍራፍሬዎች በቀን ስንት ጊዜ ይጠቀማሉ?	በቀን _____ጊዜ	
207.	አብዛኛዉን ጊዜ በአንድ ሳምንት ውስጥ ስንት ቀን አትክልቶችን ይመገባሉ?	በሳምንት_____ቀን	ምንም ከሌለ 0 ይሞላ... ወደጥየቄ209ይህዱ
208.	አትክልት ከሚመገቡባቸዉ ቀናት ዉስጥ በአንዱ ቀን እነዚህን አትክልቶች በቀን ስንት ጊዜ ይጠቀማሉ?	_____	
209.	በይበልጥ የሚወዱአቸዉን የምግብ አይነቶች ይጥቀሱ	1· _____ 2· _____ 3· _____ 4· _____ 5· _____	
210.	በቁርስና በምሳ መካከል ወይም በምሳና በእራት መካከል ወይም ከመደበኛዉ አመጋገብ በተጨማሪ ምግብ ይመገባሉ?	1. አዎ 2. አልመገብም :	መልሱ አልመገብም ከሆነ ወደጥያቄ 212ይህዱ

211.	በቀን ስንት ጊዜ ይመገባሉ?	_____	
212.	ከላይ የጠቀሱትን ምግብ ሳይጨምር በቀን ሰንት ጊዜ ይመገባሉ?	_____	
213.	ምሳዎን እንዴት ያገኛሉ?	1. ከቤት በማምጣት ወይም ቤት በመሄድ 2. ከትምህርትቤት ካፍቴሪያ በመግዛት 3. በትምህርት ቤቱ አቅራቢያ በሚገኝ ምግብ ቤት በመግዛት.	
214.	ከመደበኛ ምግብ በተጨማሪ ገዝተዉ የሚጠቀሟቸዉን የምግብ አይነቶች ይጥቀሱ።	1. ኬክ 2. ብስኩት 3. አይስክሬም 4. ቸኮሌት 5. ሌላ ካለ ይጠቀስ_____	
215.	ፊልም /ሲኒማ ቤት በሚሄዱበት ጊዜ ምግብ ገዝተዉ ይመገባሉ?	1. አዎ 2. አልመገብም 3. ፊልም ቤት አልሄድም	
216.	ቴሌቪዥን በሚያዩበት ጊዜ ምግብ ይመገባሉ?	1. አዎ 2. አልመገብም 3. ቴሌቪዥን አላይም	
217.	ጥናት በሚያጠኑበት ጊዜ ምግብ ይመገባሉ?	1. አዎ 2. አልመገብም	
218.	አንድ አንድ ቀን ቁርስ፣ምሳ ወይም ዕራት ሳይበሉ የሚቀሩበት ቀን አለ?	1. አዎ 2. የለም	

አካላዊ እንቅስቃሴ እና ስራ ጋር የተየያዘ እንቅስቃሴ

ክዚህ ቀጥሎ የተለያዩ የአካል እንቀስቃሴ በማካሄድ የሚያሳልፉአቸዉን ጊዜ በተመለከተ እጠይቅዎታለሁ።

ጥያቄ		መልስ	
219.	ከትምህርት ዉጭ ተጨማሪ የሚሰሩት ስራ አለ?	1. አዎ 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ 226 ይሀዱ
220.	ከዚህ በላይ ለተጠቀሰዉ ጥያቄ መልሰዎ አዎ ከሆነ ስራዎ ብርቱ ጉልበት የሚጠይቅ ተግባር ወይም ቶሎቶሎ መተንፈስን ወይም ፈጣን የልብ ምት ሊያስከትል የሚችል ተገባር ያለ ማቋረጥ ቢያንስ ለ10 ደቂቃ ይሰራሉ?	1. አዎ 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ 226 ይሀዱ
221.	አብዛኛዉን ጊዜ በሳምንት ስንት ቀን ብርቱ ጉልበት የሚጠይቅ ተግባር ያከናዉናሉ?	የቀን ብዛት _____	

222.	ብርቱ ጉልበት የሚጠይቁትን ተግባራት ከሚያከናውኑባቸዉ ቀናት በ ቀን ለምን ያህል ጊዜ ይሰራሉ?	ስዓት ____ ደቂቃ _____	
223.	ስራዎ መጠነኛ ጉልበት የሚጠይቅ ተግባር ወይም መጠነኛ የመተንፈስ ወይም የልብ ምት ፍጥነት ጭማሪ ሊያስከትል የሚችል ተገባር ያለ ቋረጥ ቢያንስ ለ10 ደቂቃ ይሰራሉ?	1. አዎ 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ 226ይህዱ
224.	አብዛኛዉን ጊዜ መጠነኛ ጉለበት የሚጠይቁ ስራዎችን በ ሳምንት ስንት ቀን ይሰራሉ?	የቀን ብዛት_____	
225.	መጠነኛ ጉልበት የሚጠይቁ ተግባራት ከሚያከናውኑባቸዉ ቀናት በ አንዱ ቀን ለምን ያህለ ጊዜ ይሰራሉ?	ስዓት ____ ደቂቃ _____	
ከዚህ ቀጥሎ ከቦታቦታሲንቀሳቀሱ በብዛት የሚጠቀሙባቸዉን መንገዶች እጠይቅዎታለሁ።			
226.	ከቦታቦታ በሚንቀሳቀሱበት ጊዜ ለ 10 ደቂቃ ያለማቋረጥ በእግረዎ ወይም በብስክሌት ይሄዳሉ።	1. አዎ 2. አልሄድም	መልሱ አልሄድም ከሆነ ወደ ጥያቄ 239ይህዱ
227.	በሳምንት ዉስጥ ስንት ቀን ከ 10 ደቂቃ ያላነሰ ያለማቋረጥ በእግረዎ ወይም በብስክሌት ይሄዳሉ።	የቀን ብዛት _____	
228.	በነዚህ ቀናት ዉስጥ በቀን ምን ያህል ሰዓት ሳያቋርጡበእግር ወይም የብስክሌት ጉዞ ያደርጋሉ?	ሰአት----------ደቂቃ----------	
ከስፖርትናከመዝናናት ጋር የተየያዙ እንቅስቃሴዎች			
229.	ከፍተኛ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያሰከትል የሚችልስፖርት ቢያንስ ለ10 ደቂቃ ያክል ሳያቋርጡ ይሰራሉ?	1. አዎ 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ 232 ይህዱ
230.	አበዛኛዉን ጊዜ በሳምንት ስንት ቀን ከፍተኛ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያሰከትል የሚችልስፖርት በያንስ ለ10 ደቂቃ ያክል ያለማቀዋረጥ ይሰራሉ?	የቀን ብዛት _____	
231.	ስፖርት ከሚሰሩባቸዉ ቀናት ዉስጥ በአንዱ ቀን ሳያቋርጡ ለምን ያክል ጊዜ ከፍተኛ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያሰከትል የሚችል ስፖርት ይሰራሉ?	ስአት_____ደቂቃ_____	
232.	መጠነኛ የሆነ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያሰከትል የሚችልስፖርት በያንስ ለ10 ደቂቃ ያክል ሳያቋርጡ ይሰራሉ?	1. አዎ 2. የለም	መልሱ የለም ከሆነ ወደ ጥያቄ 234 ይህዱ

233.	አበዛኛዉን ጊዜ በሳምንት ስንት ቀን መጠነኛ የሆነ የልብ ምት ወይም ያተነፋፈስ ፍጥነት መጨመር ሊያስከትል የሚችል ስፖርት በያንስ ለ10 ደቂቃ ያክል ሳያቋርጡ ይሰራሉ?	የቀን ብዛት _____	
234.	የእረፍት ስአትዎን በምን /እንደት ያሳልፋሉ?	1. መዕሀፍ በማንበብ 2. ቴሌቭዥን፣ ቭዲዮ በማየት 3. ኮምፒተር ጌም በመጫዎት 4. ሌላካለ ይጠቀስ----------	
235.	ስፖርት ከሚሰሩባቸዉ ቀናት ዉስጥ በአንዱ ቀን ሳያቋርጡ ለምን ያህል ጊዜ መጠነኛ የሆነ የልብ ምት ወይም የአተነፋፈስ ፍጥነት መጨመር ሊያስከትል የሚችል ስፖርት ሳያቋርጡ ይሰራሉ?	ሰአት_____ደቂቃ_____	
236.	አብዛኛዉን ጊዜ በቀን ለምን ያህል ጊዜ ተቀምጠዉ ያሳልፋሉ	ስአት_____ደቂቃ_____	
237.	ከቤተሰበዎ መካከል ስኳር ፣ደም ግፊት በሽታ ወይም በጣም ከብደት መጨመር ያለበት ሰዉ አለ ?	1. አዎ 2. የለም	
238.	በአብዛኛዉ ጊዜ ከሰአት በኋላ የመተኛት ልምድ አለህ/ሽ?	1. አዎ 2. የለኝም	
239.	በአብዛኛዉ በአንድ ቀን ለስንት ሰአት በእንቅልፍ ተኝተዉ ያሳልፋሉ?	ሰአት_____	
240.	በአብዛኛዉ ጊዜ ደስተኛ ሳይሆኑ ያሳልፋሉን?	1. አዎ 2. የለም	
241.	በትምህርት ቤት ወይም በአካባቢዎ የቅርብ ጓደኛ አለህ /ሽ?	1. አዎ 2. የለኝም	

በመረጃ ሰብሳቢዉ የሚሞላ ፡ አካላዊ ልኬት

ልኬት		መልስ	ዝለል
242.	ቁመት	በሴንቲ ሜትር_____	
243.	ክብደት	በኪሎግራም _____	
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Annex IV: Declaration

By my signature below, I declare and affirm that this Thesis is my own work. I have followed all ethical and technical principles of scholarship in the preparation, data collection, data analysis and compilation of this Thesis. Any scholarly matter that is included in the Thesis has been given recognition through citation.

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