PREVALENCE OF OVERWEIGHT AND FACTORS ASSOCIATED AMONG PRIVATE KINDERGARTEN SCHOOL CHILDREN IN HOSANNA TOWN, HADIYA ZONE, SOUTH ETHIOPIA

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ABSTRACT

Introduction: The magnitude of overweight is rapidly increasing in developing countries. The children with high BMI for age are highly vulnerable for death associated with other endogenous causes. Despite the rising prevalence of overweight in children, the evidence on prevalence and associated factors was still insufficient in many developing countries including Ethiopia.

Methods and materials: A cross-sectional study was conducted among private Kindergarten school children age 3-6 years in Hosanna town, from March 1to 30, 2019. A total of 470 students from 11 private kindergarten schools were included in the study. A multi stage sampling technique was used to select the study participants. Mothers/care givers were interviewed using pre- tested structure questionnaire by home visit and signed consent was obtained. Weight and height measurements of children were done by standardized instruments. Body mass index (MBI) for age Z- score was generated by using WHO Anthroplus version 1.0.4 software. Data were entered and cleaned using EpiData3.1 and statistical analysis were done using SPSS version 20 software. Bivariate analysis was employed to identify candidate variables and multivariable logistic regression analyses were done to identify factors independently associated with overweight.

Results: Out of 470 sampled kindergarten school children, 432 were participated in the study with response rate of 92%. The combined prevalence of overweight/obesity among private kindergarten school children was 7.2%. Watching television for 2 hours and above per day (AOR= 3, 95%CI 1.3, 7.3), family size less than five (AOR =2.8, 95%CI 1.2, 7.1), consumption of snacks for more than once per day (AOR= 4.5, 95%CI 2.0, 10.5), and using parents' vehicles as means of transportation to school (AOR= 4, 95%CI 2, 10.4) were associated with overweight among private kindergarten school children.

Conclusions and Recommendations: The finding of this study showed that the prevalence of overweight in kindergarten school children was an alarming. Age of children, watching television for long hours, frequency of snack, less family size and type of transportation to school were significantly associated with overweight in private kindergarten school children.

All concerning body should give focus on prevention of prevalence of overweight in children by controlling the contributing factors such as watching TV for long hours.

.**Key words:** prevalence, overweight, factors associated, kindergarten school children, Hosanna

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ACKNOWLEDGEMENT

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ABBREVIATIONS AND ACCRONYM

AOR: - Adjusted Odds Ratio

BAZ: - BMI- for –Age Z-score

BMI: - Body Mass Index

COR: Crude Odds Ratio

CVD: - Cardiovascular Disease

CL: Confidence Level

BSc: Bachelor of Science

MPH: Master of Public Health

DDS: - Dietary Diversity Score

EBR: - Ethiopian Birr

GBD: - Global Burden of Disease

KG: - Kindergarten

MD: Medical Doctor

MENA: - Middle East and North Africa

NCHS: National Center for Health Statistics

PPS: - Proportion to Population Size

SSA: - Sub-Saharan Africa

SD: - Standard Deviation

SES: - Socio Economic Status

SNNR: - South Nation Nationality Region

SPSS: - Statistical Software for Social Science

UHEWS: - Urban Health Extension Workers

UNICEF: - United Nations Children's Fund

VIF: - Variance Inflation Factor

WHO: - World Health Organization

CHAPTER ONE: INTRODUCTION

1.1.1. Background

Overweight is an abnormal accumulation of body fat that may impair health. The mechanism for excessive weight gain is clear—more calories are consumed than the body burns, and the excess calories are stored as fat (adipose) tissue(1).

Unlike using fixed BMI cut-off to classify an individual's weight status (as used for adults) children's BMI is categorized using variable cut-off points that take into account child's age. Overweight among children age less than or equal to five year is defined as BMI-for- age >2 SD, and for children age 5 to 19 years >1SD respectively(2)

The prevalence of overweight in children is increasing in all countries. Global age –standardized prevalence of obesity increased from 1.6% in 1975 to 13.4% in 2016(3).

The estimated prevalence of at risk of overweight was 21.4% in developed and 13.6% in developing countries in 2010(4). In 2015, a total of 107.7 million children from 165 countries were classified as obese(5). However, the exact cause of overweight and obesity in children is not as cleared likely arises from a complex combination of factors, such as eating habit, sedentary lifestyle (6–10).

The Sustainable Development Goals, set by the United Nations in 2015, identify prevention and control of non-communicable diseases as core priorities. Overweight was considered as one of the most contributing factors for many non-communicable diseases(9). In sub Saharan Africa, the problem is high in urban setting(11). Prevention of overweight and obesity and the treatment of children already obese, and those with overweight who are on the path way to obesity, should be considered an element of universal health coverage(9).

Most of the children in urban community of Ethiopia attended preschool in private kindergarten schools at some point since the age of 3 years(12)

1.1.2. Statement of the problem

About 38.3 million under five children around the world were overweight in 2017, an increase of 8 million since 2000(13). In developing countries the rate of increase has been more than 30% higher than that of developed countries(3).

The obesity epidemic is spreading to low –and middle – income countries mainly as a result of nutrition transition and urbanization(14). In sub Saharan Africa, the problem is high in urban setting(11).

Study conducted in different urban setting of Ethiopia, among private kindergarten school children have shown different magnitude of the prevalence of overweight and obesity. Higher dietary diversity score, consumption diary product often, reach junk foods, mother's educational level, less family size and transportation to/from school were some of the factors found to be associated with the problem(15,16).

Obesity during childhood can have a harmful effect on the body in a variety of ways. The risks of having physiological, mental, and social problems were higher among overweight children(7,10,17).

Overweight/Obesity in children was strongly associated with premature death. The children with high BMI for age were highly vulnerable for death associated with other endogenous causes (18).

Around 55% of overweight children were risk of overweight during in their later age which has well known health and economic consequences. Overweight children were high chance to be obese in adulthood than those who were not obese(9,19). The commitment to reducing under nutrition must go simultaneously with preventing over nutrition in developing countries(20).

Member States of the World Health Organization adopted a target of ensuring no rise in childhood obesity by 2025. Promoting the intake of health foods, reducing the eating of highly sugared beverage and sedentary behaviors are some of recommendation to prevent overweight/obesity among children(21).

Despite the rising prevalence of overweight in children, the evidence on prevalence and associated factors is still insufficient in many developing countries (22).

Finding from previous study in Ethiopia recommended that further study was required on prevalence and factors associated with overweight among kindergarten school children(16).

Though few study conducted on overweight in Ethiopia including kindergarten schools children, we had not found published literatures that show the prevalence and factors associated with overweight and obesity among kindergarten schools children in Hosanna town.

Therefore, the purpose of this study was to assess the prevalence of overweight among private kindergarten school children in Hosanna town, Southern Ethiopia, and to identify the associated factors.

1.1.3. Significance of the study

The results of this study could be important to provide the magnitude and factors associated with overweight among private kindergartens school children in Hosanna town. Policy makers and other stakeholders could utilize the finding of this study when designing the prevention and control strategies, and programs that could address the factors associated with overweight among children. The finding of the current study might be utilized by other researchers for further investigation.

CHAPTER TWO: LITERATURE REVIEW

Prevalence of overweight among children

According to UNICF/WHO/World bank joint estimates, 38.3 million under five children around the world were overweight in 2017, an increase of 8 million since 2000(13). Based on NHNES data, in United states there was 13.9% in preschool children(23).

The overall prevalence of overweight and obesity in children was 40% in southern Europe, but less than 10% in northern Europe. Overall magnitude of overweight higher in girls 21% as compared with boys 18.6%(24).

A 3 year cohort of 2677 children aged 3 to 6 years old in Vietnam shows the prevalence of Overweight increased from 9.1% to 16.7%.The occurrence of overweight in the study periods were 12.4% and 2.7%, respectively(25). Another study in preschool children in two Vietnamese urban area show the combined prevalence of overweight and obesity was 21.1%(26).

Across sectional survey on preschool children of age 2- 6 years show over all prevalence of overweight and obesity was 32.6%(27). 9.2% from national cross sectional survey among children age 2-5 years in Lebanon (28).

Study in eastern Mediterranean region on children age less than five years indicate that the prevalence of overweight and obesity range from 1.9% to 21.9%(29).

Finding from cross-sectional study conducted on 500 children of age 2-5 years, in kindergartens of Brigand Iran show that prevalence of overweight and obesity was 18%(30). Another cross-sectional study on preschool children aged 2 to 5 years in urban area of Babol, northern Iran show the prevalence rate of overweight and obesity were 11.8%, 15% respectively(31).

Evidence on childhood overweight and obesity in Nigeria show that the prevalence of overweight and obesity among preschool children were 15% and 8.6%, respectively(32).

Finding from Demographic and Health Surveys in 26 SSA countries indicate that overall prevalence of overweight and obesity of under-five children was 6.9%. In Sierra Leone (16.9%), Comoros (15.9%) and Malawi 14.5%), were countries that high prevalence of overweight reported, but in Togo (2.6%) and Senegal (2.0%)(33).

A cross sectional study carried out among nursery school children of age 3-6 years in Kenya show,19.8% were either overweight or obese(34).

Evidence from systematic review and meta-analysis show that the combined pooled prevalence of overweight and obesity among children and adolescences in Ethiopia was 11.30%(35).

According to result from studies conducted among preschool children in different region of Ethiopia, there were variation in prevalence of overweight and obesity. Across sectional study conducted among private kindergarten school children of age 3-6 yeas in Bahidar city, Northern Ethiopia reveal that the combined prevalence of overweight and obesity was 6.9%(15). Another study in Gondar city among children of age 3-5years show that the companied prevalence of 13.8%(36).

Study conducted in Eastern Ethiopia, jigjig city among private kindergarten school children age 3-6 years indicate that 34.6% prevalence of overweight and obesity(16). Across sectional study finding from Hawassa city, Southern Ethiopia show that the prevalence of overweight and obesity among preschool children of age 3-5 was 10.7%(37). Globalization along with rapid urbanization and limited physical activities are making a conducive condition for raising of overweight in children.(13)

Factors associated with overweight among children

Even though the exact causes of overweight in children was unclear, Scio demographic factors, dietary habits of children and sedentary behaviors mostly associated with rapid increment of overweight among children.

Socio economic factors

Different studies concerning gender in risk of children overweight/obesity give different result. Several studies reveal that being boy increase the risk of overweight/obesity(38–40). Oppositely other study show being girl increase the risk of overweight/obesity(41).

The epidemics of obesity are spearing to low and middle income countries as result of new dietary habit and sedentary way of life(42). Child who eat unhealthy snake /with extra calories, sugar, and fat/,and not breast fed increase the risks of childhood obesity(39). Another study also show there was positive association between consumption of snack and being overweight in children(43). A cross sectional study conducted among preschool children in Jijga town, eastern Ethiopia, show girls had higher risk of developing overweight and obesity than boys(16). Similarly pooled effect sizes of six studies in Ethiopia showed female children were more likely at risk of overweight/obesity(35).However, other studies in Africa have found that there were no association between gender and childhood overweight and obesity(44,45)

Previous study in Cameron identifies the negative association of birth rank of children with childhood overweight and obesity(46). Study in developing country spectacle that family with high income were positively associated with childhood overweight/obesity(44,45,47). But some study in developed country revealed that low or medium socio economic status of family were associated with child overweight and obesity(48). Finding from study in Kenya suggested that there was significant association between household's monthly income and childhood overweight and obesity(45)

Studies shown in different region of Ethiopia specify that family income had significant association with childhood overweight/obesity(16,37).Pooled result of 10 study in Ethiopia revealed that child from high income families have more likely at risk of overweight/obesity(35). A cross sectional study conducted among kindergarten school children in Jijga city eastern Ethiopia show that overweight and obesity in children was associated with monthly income of the family(16)

Results of studies in different countries show that educational and occupational status of parents have association with the risk of children overweight(38,39,47).However, analysis of four studies in MENA region that reported odds of childhood obesity related to mother's education

showed inconsistent result(44). A systematic review results in Ethiopia show risk of childhood overweight/obesity more in non-illiterate mothers(35).

As study in Bahirdare, North West Ethiopia shows that family size had significant association with childhood overweight/obesity(15).

Factors related to dietary habits of the children

Several studies suggest that unhealthy diet, fat intake, consuming large amounts of food and eating fast food were the risk factors for development of childhood overweight/obesity(26,28,41,49). Finding including dietary habit in different setting of Ethiopia reveal that high dietary diversity(15,36), sweet food preference(35), consumption of sweet food(15,36). less use of fruit/vegetable, reach junk food and eat diary food products(16),are more likely associated with childhood overweight/obesity. The evidence show that there was negative association between exclusive breast feeding during the first six months of life and risk of overweight among children(50)

Factors related to sedentary behaviors of children

Evidence from study on childhood overweight/obesity in Lebanon showed that watching TV while eating was significantly associated with risk of overweight/obesity(28). Study indicate that Watching television increase the chance of sweet and fast food intake(51). Study also reveal that presence of television in the bedroom contribute to the occurrence of overweight in children(52). Pooled estimate from systematic review in middle east including revealed that there was positive association between time spent in watching TV and childhood overweight and obesity(44). But the study finding from Nigeria show that there was no association between watching TV and overweight/obesity among preschool children(32)

There was few number of studies examined the association between screen time/watching TV/ and overweight and obesity among children in Ethiopia. A cross sectional study in Gondar city among preschool children showed that time spent in watching television>2hr/day was more likely associated with childhood overweight and obesity(36). A study that examine the predictors of obesity among children show, children who sleep less hours per day had significantly higher incidence of obesity than those who sleep recommended hours per day.(53). Another cross

sectional study finding suggest that both short and long duration of sleep time are significantly associated with childhood overweight and obesity(54). The evidence concerning to sleep duration also revealed that the children who sleep for less than the recommended hours per day had high risk of being overweight(55,56).

The previous study revealed that there was association between type of transportation to school and overweight among children (34,57)

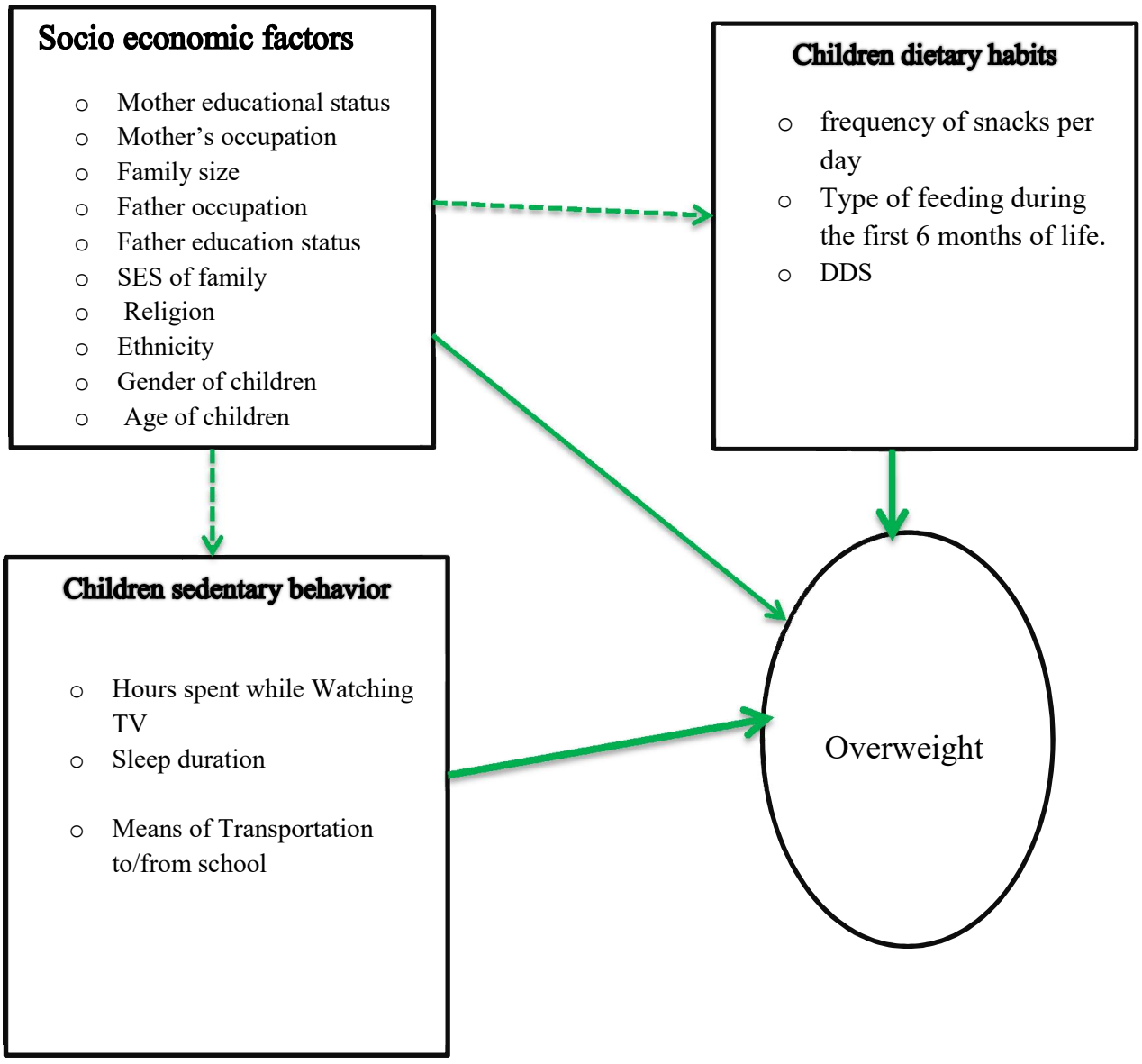

Figure 1 show that conceptual frame work developed by reviewing different literatures, (15,16,70,34,35,37,46,64,67–69)

CHAPTER THREE: OBJECTIVES

3.1. General objective

- To assess the prevalence of overweight and associated factors among private kindergarten school children in Hosanna town, 2019.

3.2. Specific objectives

- To assess the prevalence of overweight among private kindergarten school children in Hosanna town,2019
- To identify the factors associated with overweight among private kindergarten school children in Hosanna town,2019

CHAPTER FOUR: METHODS AND MATERIALS

4.1. Study area and period

Hosanna town is the capital of Hadiya zone, located in south west Ethiopia. It has found 232km far from Addis Ababa, and 168km from Hawassa /capital of SNNR of Ethiopia /. According to Hosanna town administrative health office 2010 report, total population of town is 107371, of whom 51632 are men and 53739 are women respectively. Based on information from Hosanna town education office, there are total of 15 public and 84 private including kindergarten schools found in the town, with a total enrollment of 23,315 male and 24,229 female students. In the town the kindergarten schools are offered by private sectors. There are 38 private kindergarten schools found in the town with total of 8950 students of whom 4,374 are male and 4576 are female respectively. This study was conducted from March 1- 30/ 2019.

4.2. Study design

A cross-sectional study design was conducted among private Kindergarten school children.

4.3. Source population

All private kindergarten school children of age 3-6 years living in Hosanna town during the study period

4.4. Study population

All selected children of age between 3-6 years in selected private kindergarten schools during the study period.

4.5. Eligibility criteria

4.5.1. Inclusion criteria

The inclusion criteria for this study were:-

Children of age 3-6 years living in Hosanna town and enrolled in selected private kindergarten school.

4.6. Sample size determination

The sample size was calculated for each specific objective.

For first objective (prevalence of overweight among private KG school children)

By using single population formula as follows

$$n = \frac{(Z_{1-\alpha/2})^2 \, p \, (1-p)}{d^2}$$

Where n = required sample size

$Z_{1-\alpha/2}$ = 1.96 for confidence limit of 95%

d = 4% (margin of error)

p = expected prevalence of overweight in preschool children = 11% which was taken from study conducted in Hawassa Southern, Ethiopia(37).

Therefore, n = 235, by adding non response rate 5%, and multiplying with design effect of 2, = 494.

For second objective (factors associated with overweight)

Table 1 show the sample size calculation for factors associated with overweight among children in Hosanna town, 2019

SN	Variables	Assumptions							Sample size	Reference
		Power	Level of confidence	Ratio of unexposed to exposed	Out come in Un exposed	odds ratio	Non response rate	Design effect		
1	Snacks eaten per day(twice and more	80%	95%	0.64	25%	5.93	5%	2	118	(16)
3	Time spent while watching TV(≥2hrs)	80%	95%	2.1	7.6%	4.5	5%	2	311	(36)

Therefore, the larger sample size was from objective one (i.e. 494). Since the source population was less than 10,000, then finite population correction formula was applied.

$$nf = {no}/{(1 + (no - 1)/N}$$

Where, N was size of source population = 8950

no -was sample size for infinite population = 494

nf -was sample size for finite population = 470, which was the final sample size of this study.

4.7. Sampling techniques/procedures

A multi stage sampling method was employed to select study participants. Out of a total of 38 KG schools found in Hosanna town 11 were selected using simple random sampling technique. Students in each of 11 KG that fulfill eligibility criteria were listed with unique ID from student registration. Then, required sample size was proportionally allocated for each of selected KG school. Finally, children from each KG school were selected from list by simple random sampling using computer generated random number. **Figure 2** showed schematic presentation of sampling procedures.

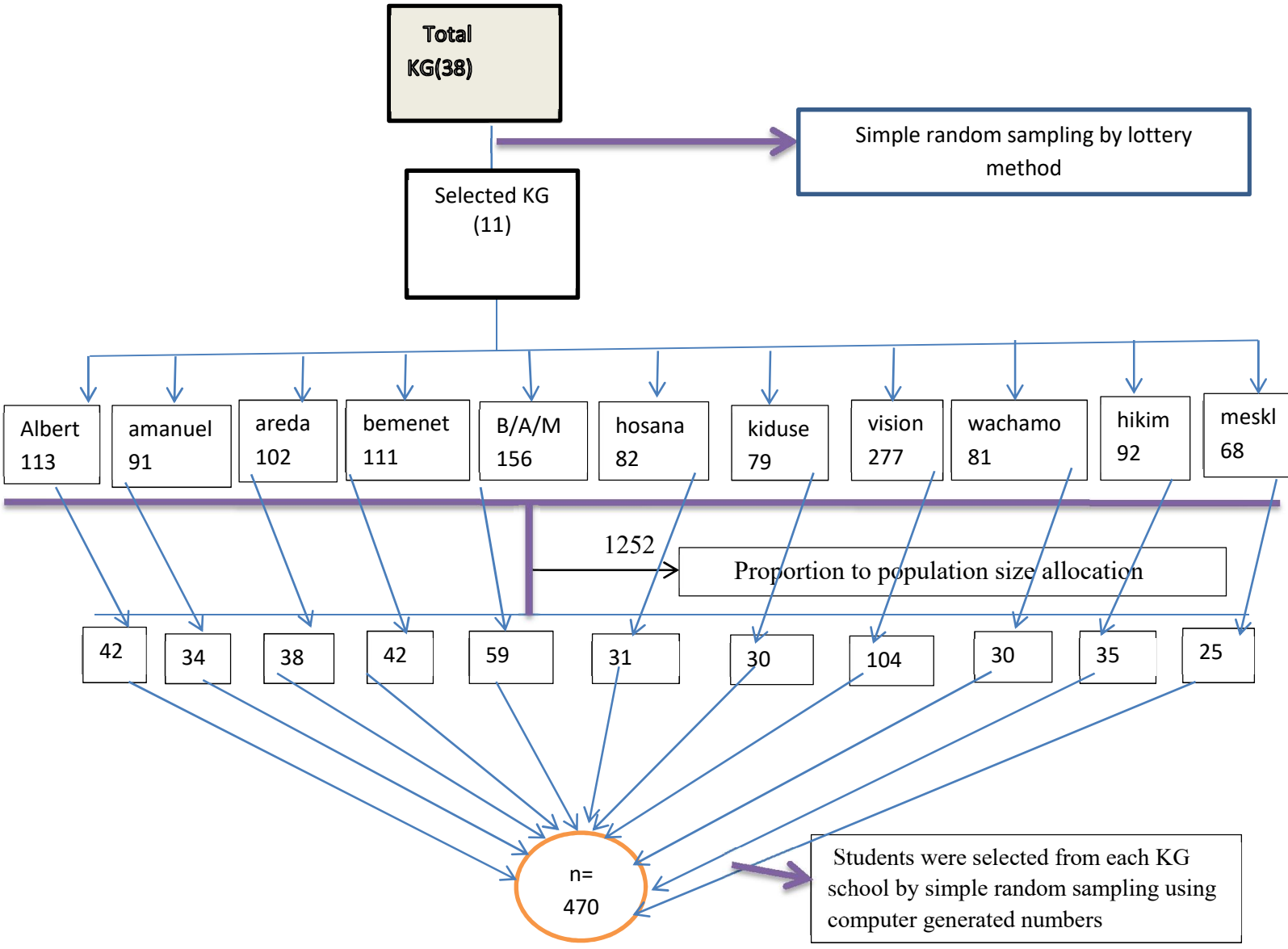

Figure 2 show schematic presentation of sampling procedures

4.8. Data collection procedures / instruments, personals/

Data related to parental and children characteristics, children's behavioral factors, and feeding practice were collected from children's mothers/caregivers at home. The structured questionnaire which was developed by reviewing different literatures was used. 8 food groups /(grains, roots, or tubers), vitamin-rich foods, other fruits or vegetables, (meat, poultry or fish, eggs), (pulses, legume or nuts), milk and milk products, and food cooked with oil or fat/ with locally available food items in each group were used to assess dietary diversity score of the kindergarten school children(58).

Socioeconomic status was assessed using household fixed asset and housing condition questions from another previous study(59). Weight was measured with UNICE portable weight scale with a digital screen. Height was measured with height board. Questionnaires were filled by data collectors (8 UHEWS) by interviewing the mothers/care givers of the selected children's via home visit. Address of mother/care givers were obtained from selected student's profile. The address was arranged in kebele, with their phone number. The data collectors/UHEWs/ were assigned to their functioning kebele, so that they could easily access parents' home.

After signed consent from mothers/care giver was obtained, and simple oral explanation given to children, anthropometric measurements were taken at school. Weight was measured by using weighing scale and height was measured on standing position by using measuring boards(60). Z-scores values for BMI-for-age (BAZ) of children were generated by using WHO Anthroplus 2009 software version1.0.4(61).

Data related to children's dietary diversity were collected by asking mothers/care givers to report type foods which consumed by the children in past 24 hours prior to data collection. If children ate at list one pre listed locally available food item in respective food groups had score one for that food groups otherwise zero(62).

The following diagram summarizes the pathway from recruitment of study population to taking of the anthropometric measurements.

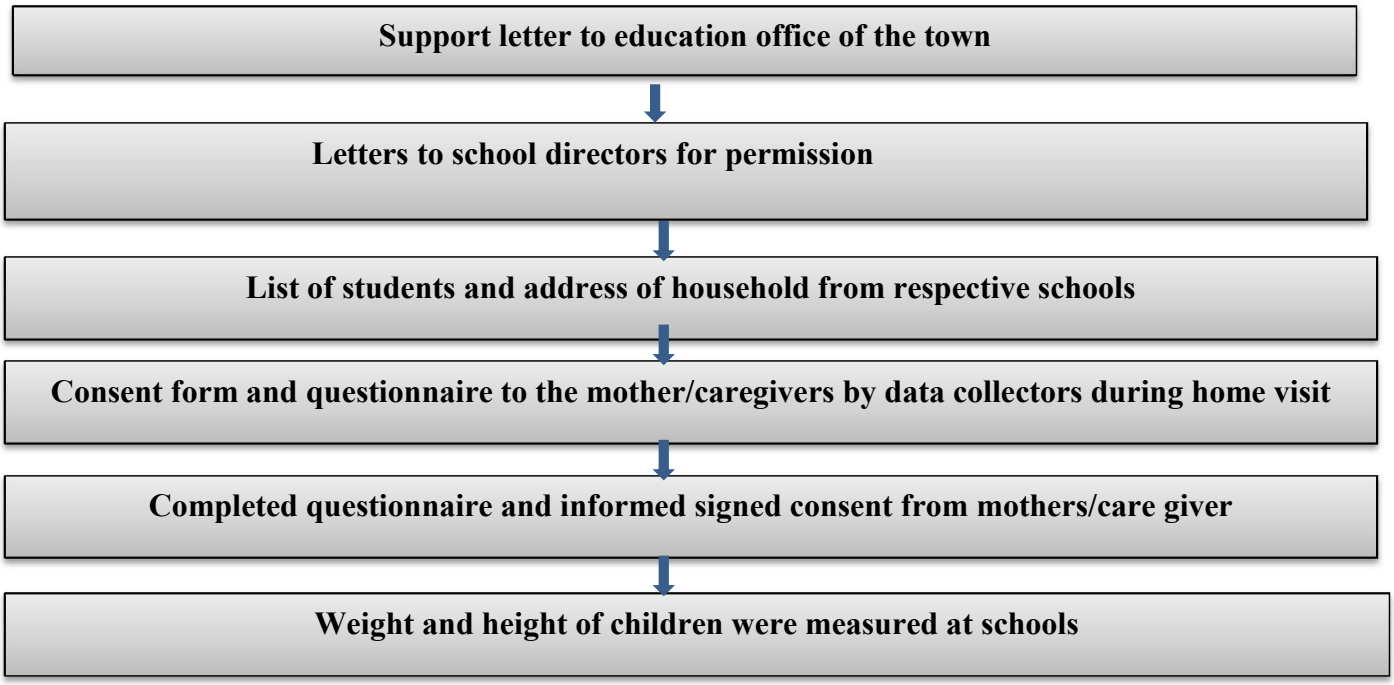

Figure 3 shows that data collection schematic flow diagram Hosanna town, 2019.

4.9. Data quality control

Data quality assurance was done before, during and after data collection. To maintain consistency, the questionnaire was first translate from English to Amharic, and retranslated back to English by professional translators and public health experts. Two days training was given for data collectors on weight and height measurement, data collection techniques and procedures based on the questionnaires, and also about the objective of the study, confidentiality of information. The training was given by principal investigator. Locally available foods and their groups were discussed with UHEWS, nutrition experts and principal investigator prior to data collection.

Pretest was conducted on 5% of sample size in private kindergarten school children age 3-6 year in a school which did not selected. After pretest discussion and necessary modification on questionnaire was carried out.

The inter-rater reliability in weight and height measurement was checked on six children. The common inter rater correlation coefficient for weight and height was 0.98 and 0.97 respectively.

Weight and height measurements were done by using calibrated equipment and standardized techniques. The children were wearing light closes during weight measurements and height was measured with bare foot.

During the data collection, the procedure was observed closely by the supervisors and the principal investigator. Data quality and completeness was assessed every day after data collection. Weight of the children was measured with UNICE portable weight scale with a digital screen designed to the nearest 0.1kg and the height was measured with stadiometer to the nearest 0.1cm. Measurement scales were being carefully handled and calibrated by placing 2 kilogram iron bars before measurements started and the data collectors check whether the scales were at 0.00 reading before each measurement.

4.10. Study variables

4.10.1. Dependent variable

Overweight

4.10.2. **Independent variable**s

The independent variables for this study were gender, age of children, socio economic status of family, educational status of father, educational status of mother, occupational status of mother, family size, and children's DDS, frequency of snack eaten, type of feeding during the first 6 months of life, duration of watching TV per day, means of transportation to school

4.11. Operational definition and definition of terms

Kindergarten school children: - preschool children of age between 3 to 6 years.

Private kindergarten schools are those schools that are not funded by government including religious academic schools

Overweight for children age less or equal to 5 years is defined as BMI-for- age >2SD, and **f**or children age 6 years was defined as BMI-for- age >1 (2).

Snacks: - means a foods which eaten by child before or after the breakfast/lunch/dinner during 24hours periods.

Sleep duration: - estimated hours child spent while sleeping in the previous night. According national sleep foundation guideline in USA 10-13 hours per day were recommended for preschool children age 3-6 years(63).

DDS was number of food groups consumed by children during 24 hours prior to survey and divided in to three sub groups as high (>=6), medium (3-5), and low (<3)(37).

4.12. Data processing and analysis

Data were checked for completeness, cleaned and entered in to epi_data version 3.1. Data from epi data software were exported to WHO Anthro plus software version 1.0.4, to obtain BMI for age Z score, and re-exported to SPSS version 20. All statistical analysis was performed using SPSS version 20 software. Descriptive statistical analysis was conducted using frequency, percentage, mean and median.

Principal component analysis (PCA) was conducted to transfer the asset information in to latent factors and the first PCA explaining most of the variation was taken as a wealth score. The wealth score was divided into three wealth tercile (lowest, middle and highest). The DDS which computed from food groups that consumed by the children was divided into tercile (lowest, middle and highest)(62).

Bivariate analysis was done to identify variables candidate for multivariable logistic regression model at p values of 0.25. Variables with p value < 0.25 on the bivariate analysis were entered to the multivariable logistic regression model and then stepwise backward procedure was applied at p values of 0.05. Multicollinearity and interaction of the variables in the final model were diagnosed with VIF and interaction terms significance respectively. Model fitness was checked by using Hosmer and lemeshow goodness of model fit test. Adjusted odds ratios (AOR) with 95% confidence interval were reported to show the predictors' strength and significance of association at p value 0.05. Tables and graphs were used for data presentation

4.13. Ethical consideration

Ethical clearance was obtained from Ethical review committee of Jimma University. Administrative permission was obtained from school managements. Informed written consent was taken from the mother/caregiver of children through home visit by data collectors. Simple oral assent from child was taken for anthropometric measurements. Confidentiality was ensured throughout the execution of the study via disclosing personal information on the questionnaire by giving number instead of name.

4.14. Dissemination plan

Finding of the study will be presented to Jimma university department of Epidemiology, and then submitted to Jimma university post graduate library, faculty of public health and department of Epidemiology. The finding will be presented to Hosanna town health and education offices. Efforts will be made to publish in reputable journal.

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CHAPTER FIVE RESULTS

5.1 Socio demographic characteristics of study participants

Out of total 470 parents child pair recruited in the study, 432 were participated in the study with response rate of 92%.

From total of 432 children participated in the study, 231(54%) were females. The mean (SD), 95%CL age of the children was 56(8.6), (55-57) months.

Of the total private kindergarten school children participated in this study 288(66.6%) were in age groups of 36 to 60 months while the rest 144(33.3%) were in 61-72 month age groups. 165(38.2%) of the children were recruited from KG1. The figure 4 shows the educational status of the children.

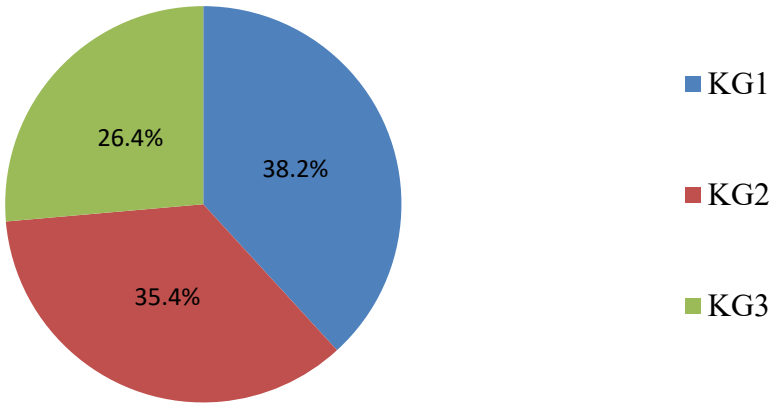

Figure 4 show that the educational status of the private kindergarten school children in Hosanna town , 2019.

From total children's mother 171(39.6%) had attained secondary education, 146(33.8%) college and above, and 40(9.3%) had any formal education respectively.

199(46%) of parents had the family size greater than 5, and 37.7% was found in medium socio economic status.

The socio-demographic characteristics of parents of the kindergarten school children were shown in **Table 2.**

Table 2 showed that socio demographic characteristics of parents of kindergarten school children in Hosanna town, 2019.

Variable	Frequency	Percent (%)
Religion		
Protestant	242	56
Orthodox	88	20
Muslim	76	17.6
Others	26	6
Total	432	100
Ethnicity		
Hadiya	232	53.7
Kenbeta	86	19.9
Guraga	59	13.7
Silta	47	10.9
Others	8	1.9
Total	432	100
Educational status of mother		
Illiterate	41	9.5
Primary education	75	17.4
Secondary education	171	39.6
College and above	145	33.6
Total	432	100
Educational status of father		

Primary and below(0-8 class)	64	15
Secondary education(9-12)	159	37
College and above	209	48
Total	432	100
Mother occupation		
House wife	146	33.8
Employed	138	31.9
Merchant	148	34
Total	432	100
Father occupation		
Government/non-government employed	216	50
Merchant	103	23.8
Daily worker	70	16.2
Unemployed	43	10
Total	432	100
Family size		
<5	233	53.9
>=5	199	46.1
Total	432	100
Socio economic status of family		
Low	122	28.2
Medium	163	37.7
High	147	34
Total	432	100
Number of total participants =432		

5.2 Dietary habits of children

Out of 432 private kindergarten school children 397(91.9%) consumed snack daily, of whom 142(33%) consumed more than once per day. 280(64.8%) of kindergarten school children feed exclusive breast milk during the first six months of life. 417(96.5%) of kindergarten school children consumed grain, root and tuber products and, 237(54.9%) consumed food vitamin A rich fruit and vegetables. The median (IQR) dietary diversity score was 6(2).

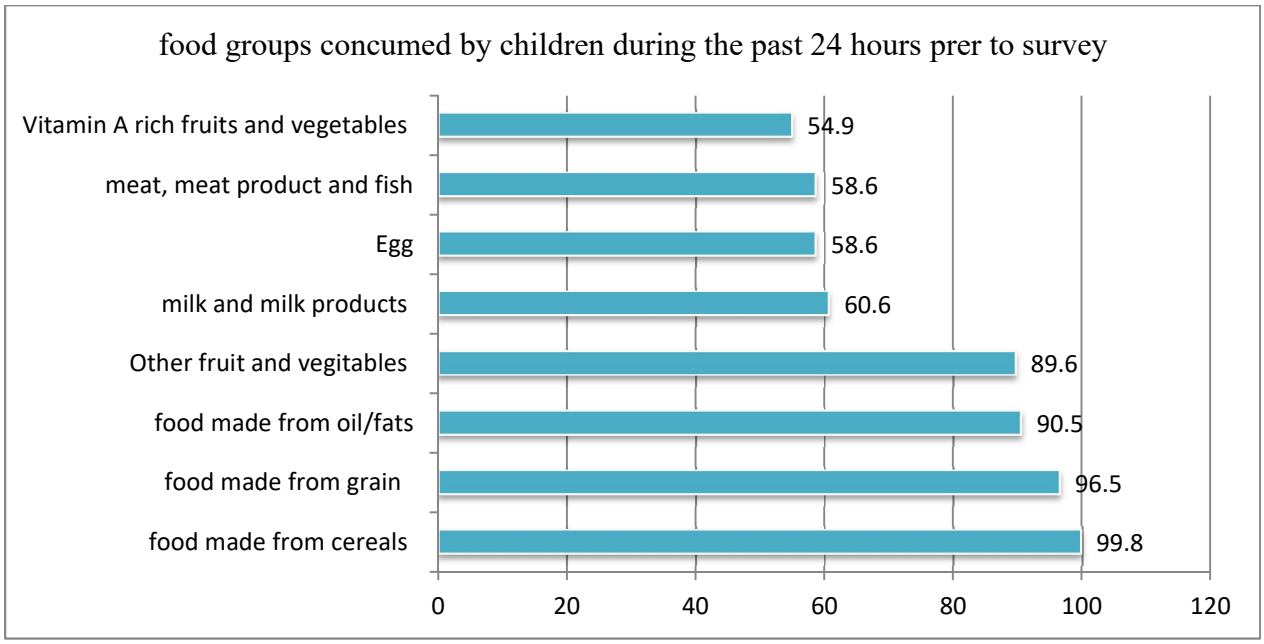

Figure 5 : Food groups consumed by private kindergarten school children during the past 24 hours prior to this survey in Hosanna town 2019

5.3 Sedentary behavior of children

Out of 432 private kindergarten school children participated in this study 287 (66.4%) walking, 73(16.9%) parents' vehicles and 72(16.7%) public/school buses used as means of transportation to school. About 34.4% of kindergarten school children spent greater than 2hourse while watching television and 33.1% slept for less than 8 hours per day.

Anthropometry of children

The median weight, mean ±SD height and mean ±SD BMI for age Z score of the children who participated in this study were 19.0kg, 110 ±8.3 cm and .11 ±.99 respectively.

Out of 432 private kindergarten school children participated in this study, 379(87.7%), 22(5.1%), 19(4.4%) and 12(2.8%) were in normal, underweight, overweight and obese range in BMI for age classification. BMI for age classification of weight status of private kindergarten school children which generated from WHO Anthro plus version 1.0.4 software was presented in the following figure 6.

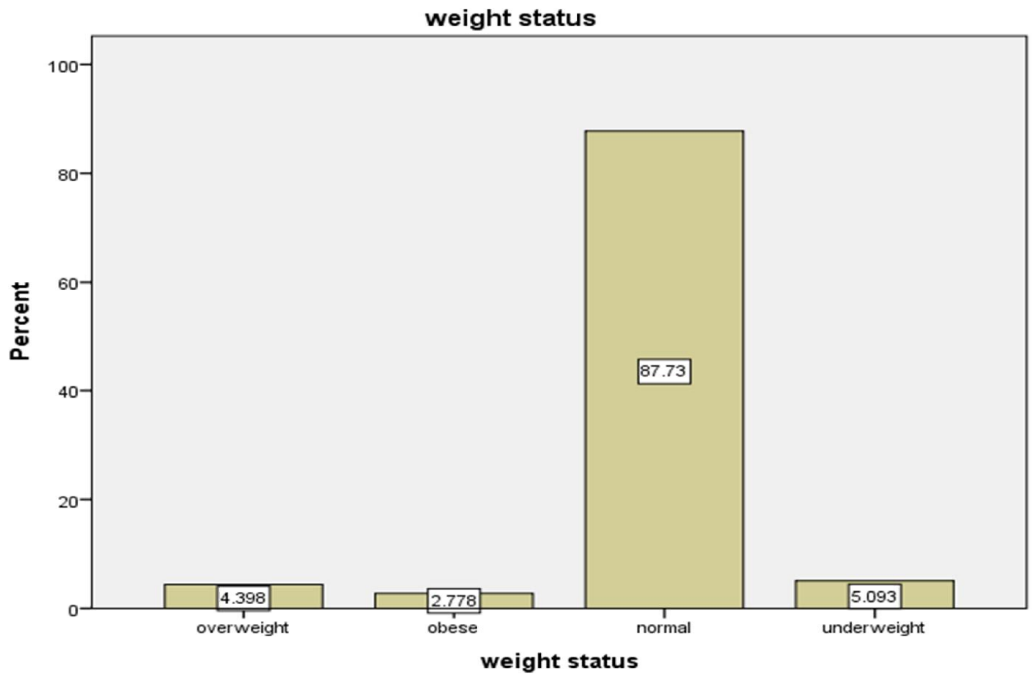

Figure 6 show that the weight status of private kindergarten school children in Hosanna town, 2019

5.6 Prevalence of overweight among private kindergarten school children

The prevalence of overweight among private kindergarten school children in this study was 7.2%.

The result from cross tabulation indicate that there were no significant difference in the combined prevalence of overweight and obese among males and females kindergarten school children (p value = 0.275).

Table 3 showed that the relationship between gender of private kindergarten school children and overweight in Hosanna town, 2019.

Variables		Weight status						P value
		Overweight		Not overweight		Total		
Sex		N	%	n	%	n	%	P= 0.275
	Male	20	8.6	211	91.3	231	53.5	
	Female	11	5.3	190	95	201	46.5	
	Total	31	7.2	401	92.8	432	100	

5.7 Factors associated with overweight among private kindergarten school children

5.7.1. Results of bivariate analysis

In bivariate analysis age and educational status of children, family sizes were associated with overweight among private kindergarten school children. The results of bivariate analysis were shown in the **Table 4.**

Table 4 : showed the results bivariate analysis in Hosanna town Hadiya zone south Ethiopia, 2019.

Variables		Overweight			COR(95%CI)	P value
		Yes	No	Total		
Socio demographic characteristics of children						
Sex	Male	20	211	231	1.64(.76-3.5)	0.26
	Female	11	190	201	1	
	Total	**31**	**401**	**432**		
Age in months	36-60	12	276	288	1	
	61-72	19	125	144	**3.5(1.65-7.4)**	**0.001**
	Total	**31**	**401**	**432**		
Educational status of child	KG1	10	155	165	1	
	KG2	8	145	153	0.85(0.33-2.22)	0.75
	KG3	13	101	114	**2(0.84-4.7)**	**0.12***
	Total	**31**	**401**	**432**		
Socio demographic characteristics of parents						
Educational	Illiterate	5	36	41	1	

status of mothers	Primary (1-8 class)	8	67	75	0.86(0.26-2.8)	0.8
	Secondary level (9-12)	9	162	**171**	**0.4(0.13-1.3)**	**0.12***
	College and above	9	136	145	0.48(0.15-1.5)	0.21
	Total	**31**	**401**	**432**		
Educational status of fathers	Primary and lower(0-8)	5	59	64	1	
	Secondary level (9-12)	12	147	159	0.963(0.3-2.84)	0.95
	College and above	14	195	209	0.85(0.29-2.45)	0.85
	Total	**31**	**401**	**432**		
Occupational status of mother	House wife	13	133	146	1	
	Employed	9	129	138	0.7(0.29-1.73)	0.45
	Merchant	9	139	148	0.66(0.27-1.6)	0.36
	Total	**31**	**401**	**432**		
Occupational status of fathers	Employed	12	204	216	0.36(0.1-1.02)	0.06
	Merchant	8	95	103	0.52(0.17-1.6)	0.253
	Daily worker	5	65	70	0.47(0.35-1.6)	0.24
	Unemployed	6	37	43	1	
	Total	**31**	**401**	**432**		
Family size	<5	23	210	233	**2.6(1.14-5.9)**	**0.023**
	>=5	8	191	199	1	
	Total	**31**	**401**	**432**		
Socio economic status	Low	7	115	122	1	
	Medium	5	158	163	0.5(0.16-1.67)	0.27
	High	19	128	147	**2.4(0.99-6.0)**	**0.053**
	Total	**31**	**401**	**432**		
Diet related factors of children						
DDS	Low	8	157	165	1	
	Medium	3	83	86	0.7(0.2-2.7)	0.62
	High	20	161	181	**2.4(1.04-7.5)**	**0.04**
	Total	**31**	**401**	**432**		
Type of food during first six months of life	Exclusive breast feed	13	267	280	1	
	Mixed feed	18	134	152	3(1.3-6)	0.007
	Total	**31**	**401**	**432**		
Snake	once per day	10	280	290	1	
	more than once per day	21	121	142	**4.8(2.2-10.6)**	**0.000**
	Total	**31**	**401**	**432**		
Factors related to sedentary life style						

Watching TV in minutes	<120	11	252	263	1	
	>=120	18	120	138	**3.4(1.5- 7.5)**	**0.002**
	Total	29	372	401		
Sleeping hrs.	<8hrs	17	126	143	**2.6(1.3-5.5)**	**0.01**
	>=8hrs.	14	275	289	1	
	Total	31	401	432		
Type of transportation to school	Walking	12	275	287	1	
	By using school/public bus	5	67	72	1.7(0.58-5)	0.3
	Parents' vehicles	14	59	73	**5(2.4- 12)**	**0.000**
	Total	31	401	432		

1 **indicate the reference groups**

5.7.2 Factors independently associated with overweight among private kindergarten school children

In multivariable logistic regression, age of children, family size, snack consumption, type of transportation to school and TV watching hours were identified factors that independently associated with overweight among private kindergarten school children at p value of 0.05 and 95%CI. Thus, the odds of being overweight was 3.2 times higher among children of 61-72 months (AOR=3.2, 95% CI 1.4, 7.2). The odds of being overweight was 3 times higher among Children who watch television for more than 2 hours as compared to their counter parts (AOR= 3, 95%CI 1.3,7.3). Similarly odds of being overweight was 4.5 times higher among children who consumed snacks more than once per day (AOR=4.5, 95%CI, 2.0-10.5, and odds of Being overweight was 2.8 times higher among children whose parents with family size more than five (AOR=2.8, 95%CI (1.2-7.1)). The results of multivariable logistic regression analysis were shown in the **Table 8.**

Table 5 : showed the factors that independently associated with overweight among private kindergarten school children in Hosanna town, 2019.

Variables		Overweight			COR(95%CI)	AOR (95% CI)	P value
		Yes	No	Total			
Age in months	36- 60	12	276	288	1	1	
	61-72	19	125	144	3.5(1.65-7.4)	3.2(1.4-7.2)	0.006
	Total	31	401	432			
Time spent while watching TV per day in minutes	<120 minutes	11	252	263	1		
	>=120 minutes	18	120	138	3.4(1.5- 7.5)	3(1.3-7.3)	0.023
	Total	29	372	401			
Snack eaten	Less than once per day	10	280	290	1	1	
	More than once per day	21	121	142	4.8(2.2-10.6)	4.5(2.0- 10.5)	0.001
	Total	31	401	432			
Family size	<5	23	210	233	2.6(1.14-5.9)	2.8(1.2-7.1)	0.024
	>=5	8	191	199	1		
	Total	31	401	432			
Type of transportation to school	Walking	12	275	287	1		
	Public/school bus	5	67	72	1.7(0.58-5)		
	Parents' vehicles	14	59	73	5(2.4- 12)	4(1.6-10.3)	0.004
	Total	31	401	432			

1 indicate the reference groups

CHAPTER SIX: DISCUSSION

This study was aimed to assess the prevalence of overweight and associated factors among private kindergarten school children age 3-6 years.

Accordingly the combined prevalence of overweight and obesity among private kindergarten school children in Hosanna town was 7.2%.The prevalence of overweight found in this study was comparable to finding in Lebanon 9.2%(64), 6.8%in sub-Saharan Africa(65), in Bahir dare city northern Ethiopia and Hawasa south, Ethiopia (15,66).

The prevalence of overweight among kindergarten school children in this study is lower than the finding of 34.6% from Jijga eastern Ethiopia(16) and 19.8% from Kenya (34), The observed discrepancy might be due to socio-cultural variations and/or easily accessibility of sweet foods or beverages from ports in the previous studies.

In this study we have found that, age of children, family size, watching television, consumption of snack, and using parents' vehicles for transportation to school were factors significantly associated with overweight among kindergarten school children.

There was statistically significant association between age and overweight in kindergarten school children. The odds of being overweight were higher among children age more than 60 months. This finding was inconsistence with the result in Bahir dar city, northern Ethiopia, where there was no statistical significant association between age group and being overweight in private kindergarten school children(15). The observed difference may due to high proportion of children age 61-72 months participated in the current study than the previous. The result may imply that the children in these age groups could get incentive from the parents and purchase the energy dense fast foods and beverages, even though the current study did not assess whether the children were got or not the incentive from the parents.

Our result indicates that there was statistically significant positive association between overweight in kindergarten school children and watching television for more than two hours per day. This result was agreed with another study done in Gondar and Jijga (16,36). The children who spent long hour while watching TV was reported high intake of sugar sweetened beverage and fast foods(51).

In this study about 33.1% of kindergarten school children were slept for less than 8 hours per day. The evidence from another previous study show that children who get less than the recommended amount of sleep for their age are at risk of developing overweight (55,56). Another possible explanation may be advertisement of unhealthy foods and beverages with television may alter the preference of foods, Even though our study did not address the association between TV viewing and consumption of highly advertised foods items.

In this study we have found that there was significant positive association between frequency of snack consumption and being overweight among kindergarten school children. This result is agreed with the finding in USA that, snack frequency was associated with high risk of overweight(43).Another study in Jijig eastern Ethiopia also support this finding, that eating snack by kindergarten school children for more than once in a day was associated with development of overweight(16). The possible explanation may be due to that children consumed fast foods such as biscuit, chips, chocolate, and other energy dense foods during snack time, while the current study did not assess the type of food consumed during snack time.

The present study also found that type of transportation to school was significantly associated with being overweight among kindergarten school children. Being overweight was higher among kindergarten school children who go/back to school by using parents' vehicles as means of transportation. This finding also comparable with study reports in Kenya(34). Another evidence also support that active traveler to school were less likely to be overweight(57). This may be due to the fact that the children were limited from physical activity while using the vehicles to go/ back to school frequently.

This study also show that family sizes less than five was associated with increased risk of overweight among children compared to family size larger than five. This was supported by finding in Bahir dare(15). A smaller family size might imply less sharing of available food and other family resources, which in turn increase access of having to excessive energy intake and overweight.

Study limitations

- The children who recruited for this study were those enrolled in kindergarten school. Thus, the generalization of the finding for all kindergarten school age children may be doubtful.
- Gathering data concerning to diet and age of children may lead to recall bias.
- This study did not incorporate the genetic factors like history of parental obesity and environmental factors such as space adequacy for physical activity.

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The finding of this study showed that the prevalence of overweight in kindergarten school children was an alarming. Age of children, watching television for long hours, frequency of snack, less family size and type of transportation to school were significantly associated with overweight in private kindergarten school children.

Recommendation

For health department of the Hosanna town

The department of health should integrate the prevention and control of overweight in children with under nutrition.

For health centers

Routine assessment of weight status of children and discussion about factors contributing occurrence of like watching TV for long hours with community should be undergone.

For parents and general publics

- Parents/publics should control the children not to spend more hours while watching television.
- Modification of feeding practice especially snack consumption for children by discouraging the consumption of junk foods, and reducing frequency.

For researchers

- Further research should be done by incorporating children from whole community by including genetics and environmental factors that did not included in this study.

For policy maker

The ministry of health of Ethiopia in collaboration with ministry of education should incorporate the prevention and control of overweight among kindergarten school children in urban health extension programs.

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Appendix I: Informed consent

Hello!

My name is ----------I am here on behalf of Tamirat Hundito, student of Jimma university institute of health. He is conducting a research on "prevalence of overweight /obesity and associated factors among private KG school students in Hosanna town". He received permission to conduct this study from Jimma university institute of health, Hosanna town education bureau and the school management where your child is enrolled.

We are asking you to share with us personal and confidential information and you may feel uncomfortable answering some of them, you do not have to answer if you do not wish to do so. All personal information gathered from you as my participant in this research will be kept confidential and will be used for the purpose of demonstrating the objectives of study. Any information about you will have number on it instead of your name.

We invite your child to participate in this study with other students from the selected GK schools. We shall take the weight of child as well as the height once you consent. The screening of the students for overweight and obesity will be free. There is not invasive and poses no risk for the students, but they may experience some discomfort from removing heavy clothing and shoes.

I agree that my child take part in the study.

Name of mother/care giver ----------

Signature ----------

Date ----------

Thank you for your cooperation!!!

For further information you can contact principal investigator

Email: - kedoretamirat@gmail.com

Phone: -

APPEDIX II: Questionnaire English version

Date of interview_____ Starting time ……..

Questionnaires ID number_____

No	Questions	Response	Skip
Section 1: Questionnaire to assess socio demographic characteristics of child and parents.			
	A. Child socio-demographic characteristics		
101	Sex of child	**1. Male** **2. Female**	
102	Date of birth: dd/mm/yyyy E.C	-- -----/--------/----------E.C	
103	Age of child in month		
104	Birth order of child	1. 1st 2. 2nd 3. 3rd and above	
105	Educational status of child	1. KG1 2. KG2 3. KG3	
	B. Parental socio-demographic characteristics		
106	Marital status of mother	1. Married 2. Divorced 3. Widowed 4. Single	
107	Ethnicity	1. Hadiya 2. Kenbata 3. Guraga 4. Silta 5. Other(specify)	
108	Religion	1. Protestant 2. Orthodox 3. Muslim 4. Other(specify)	
109	Educational status of mother	1. No formal education 2. Primary school 3. Secondary school 4. College and above	
110	Educational status of mother	1. No formal education 2. Primary school 3. Secondary school 4. College and above	
111	Occupation of mother	1. House wife 2. Government employed 3. Merchant 4. Daily labor	

		5. Others specify…….	
112	Occupation of father	1. Government employed 2. Farmer 3. Merchant 4. Daily labor 5. Student 6. Unemployed 7. Other specify_____	
113	How much is family size including you?	----------	
114	What is the average monthly income of your family in Ethiopian birr?	_____	
	Section 2. Questionnaire to assess household socio_ economic status (wealth index) From the following assets which do you have?		
	Household assets and services	Please circle either 'Yes' or 'No'	
201	Functional Television	1. Yes 2. No	If no, skip Q401
202	Radio/tape recorder	1. Yes 2. No	
203	Mobile telephone	1. Yes 2. No	
204	Non-mobile/fixed telephone	1. Yes 2. No	
205	Electric stove	1. Yes 2. No	
208	Refrigerator	1. Yes 2. No	
209	Laundry machine	1. Yes 2. No	
210	Sofa	1. Yes 2. No	
211	Bicycle/motorcycle	1. Yes 2. No	
212	Car	1. Yes 2. No	
	Please answer the following questions thinking about the housing condition of your household		
213	Home ownership	1. Private 2. Government 3. Rent 4. Other (specify) ———	
214	Number of rooms	----------	
215	Number of individuals per sleeping room	----------	
216	Roofing material	1. Natural material 2. Corrugated iron 3. Tiles 4. Other (specify) ———	

	Flooring material	1. Mud 2. Parquet/polished wood 3. Cement 4. Ceramic tiles 5. Other (specify) ————	

No	Questions	Responses	Skip
Section 3 Questionnaire to assess sedentary behaviors of children			
301	Does your child have TV in his/her bedroom?	1. Yes 2. No	If, No go to 403
302	For how long did your child watches TV per days? ----------		
303	For how long did your child sleep in previous night?	----------	
304	How your child goes/back to/from school?	1. By walking 2. With vehicles/Car, Bajaj) 3. Riding bicycle	
305	Does your child participate in any type of physical activity/sports?	1. Yes 2. No	If, No go to section 501
306	List type activities that your child most frequently participate		
307	In average how long does your child spent while participating in any type of physical activity per day?	_____	
	Section 4: Questionnaire to assess feeding practice of children		
401	Type of feeding during the first 6 month of life.	1. Exclusive breast feed 2. Mixed 3. Formula feed	

No	Questions	Responses		Skip
Section 5: Questionnaire to assess children's Dietary diversity				
The food groups that child consumed in past 24 hours. please put "1" if child eat at least one food item from respective food groups, otherwise "0"				
	Food groups	List of locally available foods	Yes **1** No **0**	
501	grain ,roots & tubers	Maize, teff, rice, wheat, sorghum, or any other grains or foods made from these (e.g. Injera, bread, pasta ,macaroni, kinche, rice, atmit, porridge ,& White potatoes, or other foods made from roots like godore, inset		
502	Vitamin A rich fruits plant foods.	ripe mango, ripe papaya, dried peach, and fruit juice made from these, carrot, or sweet potato & red sweet pepper		
503	Other fruits and vegetables	tomato, onion		
504	Meat,poultry,fish&seafood	liver, kidney, heart or other organ meats or blood-based foods beef, lamb, goat, chicken		
505	Eggs	Eggs		
506	Legumes, nuts and seeds	Dried beans, dried peas, lentils, nuts, seeds or foods made from these (eg. shiro wet, kik wet, misir wet, shimbra kolo, bakela ashuk, adenguare, boloke……)		
507	Milk and milk products Milk	Milk, cheese, yogurt or other milk products like aguat, arera…		
508	Oil/fat	Foods cooked in oil/fat, butter		

Section 6: Anthropometric measurement (please put to nearest of 0.1kg and 0.1cm scale)			Date of measurement
Indicators		Remark	dd/mm/yyyy
Body weight (Kg)			
Body height (cm)			
BAZ for age			

Name of interviewer----------

Signature ----------

Completed time ----------

Result of interview

A) Completed

B) Not completed

C) Partially completed

D) Refused

Checked by Supervisor: Name _____Signature_____ date -----

Thank you !!

APPEDIX III: Questionnaire Amharic version

የስምምነት መጠየቂያ/ማረጋገጫ ቅፅ

ጅማ ዩኒቨርስቲ ጤና ኢንስትቱት የህብረተሰብ ጤና ፋኩልቲ የኢፕዲሞሎጅ ትምህርት ክፍል

የተጠያቂዉ/ መላሾች የመረጃ ቅፅ

ጤና ይስጥልን እንደምን ነዎት

ስሜ ----------ይባላል። የመጣሁት በጅማ ዩኒቨርስቲ ጤና ኢንስትቱት የህብረተሰብ ጤና ፋኩልቲ የኢፕዲሞሎጅ ትምህርት ክፍል ተማሪ የሆነዉን ታምራት ሁነዲቶ ወክዬ ነዉ። የህጻናት በአሁን ወቅት ከመጠን ያለፈ ዉፍርት ስርጭት እና ተጋለጭነት ሁኔታ ለማዉቅ በሆሳዕና ከተማ በሚገኙ የግል መዋለ ህጻናት ት/ቤቶች ላይ ጥናት እያደረገ ሲሆን ከጅማ ዩኒቨርስቲ፤ ሆሳዕና ከተማ ትምህርት ጽ/ቤትና ከተመረጡ ትምህርት ቤቶችም ፍቃድ አግኝተዋል።

የእርስዎ ልጅ በዚህ ጥናት ላይ እንድሳተፍ/እነድትሳተፍ የተመረጠ/ችዉ በዘፈቀደ/ባጋጣሚ የናሙና አወሳሰድ ስልት መሰረት ለዚህ ጥናት አላማ ከተመረጡት ት/ት/ ቤቶች በአንዱ ዉስጥ ስለሚማሩ ነዉ። የእርስዎ ተሳተፎ ሙሉ በሙሉ በእርስዎ ሙሉ ፍቃደኝነት ላይ የተመሰረተ ነዉ። በጥናቱ ላይ ያለመሳተፍ ሙሉ መብት አለዎት። ለመሳተፍ ፈቃደኛ ከሆኑ በኋላም በፈለጉት ጊዜ ማቆም ወይም ማቋረጥ ይችላሉ። በጥናቱ ባለመሳተፎ የሚደርስቦት ምንም አይነት ችግር አይኖርም።

በጥናቱ ለመሳተፍ ከተስማሙ የልጆ ክብደትና ቁመት ደረጃቸዉን በጠበቁ መሳሪያዎች በ ት/ት ቤታቸዉ እንለካለን። ክብደት በሚለካበት ጊዜ ቀለል ያሉ ልብሶች እንዲሁም ቁመት በሚለካበት ጊዜ ደግሞ በባዶ እግር ይሆናል። በተጨማሪም የተወሰኑ ጥያቄዎችን እንጠይቆታለን። በዚህ መጠይቅ ስለ ማህበረዊና ኢኮኖም፤ አመጋገብ ልምድ ፤ አካላዊ እንቅስቃሴና በመቀመጥ የሚያሳልፉትን ጥያቄዎች እጠይቅዎታለሁ። በመጠይቁ ጊዜ ጥሩ ስሜት ካልተሰማዎት በማንኛዉም ጊዜ አቋርጠው መሄድ ይችላሉ። መጠይቁ 15 ደቂቃ ይህል ይፈጃል።

ይህ ጥናት ፖሊሲ አውጪዎችና የሚመለከታቸው አከላት ከመጠን ያለፈ ውፍረትና ተያያዥ ችግሮቹን የመከላከያና መቆጣጠርያ መንገዶችን እንዲቀርፁና እንዲተገብሩ እንደ መነሻ ይሆናል የሚል ፅኑ እምነት አለን። በመጨረሻም ከእርስዎ የምንሰበስበው መረጃ ከስምዎ ጋር አይያያዝም። ስምዎት እንደማይጠቀስና ለማንም አካል አልፎ እንደማይሰጥ ልናረጋግጥ እንወዳለን። የዚህ ጥናት ውጤት ግን ተጠርዞ እና ተዘጋጅቶ ለሚመለከታቸው የጤና ድርጅቶ ወይም ለሌሎች አካላት ሊሰጥ ይችላል።

ለተጨማሪ ማብራሪያ የዋና አጥኚዉን አድራሻ ይጠቀሙ

ስም ፡ ታምራት ሁነዲቶ

ኢሜይል ፡ kedoretamirat@gmail.com

ስልክ ፡

የስምምነት መጠየቂያ/ማረጋገጫ ቅፅ

ከላይ በሰጠዎት መረጃ መሰረት ልጆዎ በጥናቱ ላይ ለሳተፊዎ ፍቃደኛ ነዎት?

1. አዎ

2. አይደለሁም

ፍቃደኛ ካልሆኑ ምክኒያቱን ፅፈው ወደሚቀጥለው ተሳታፊ እለፍ ————----------

የህጻኑ/ኗ እናት/ተከባከብ ፊርማ---------- ቀን ----------

የቤተሰብ ፋቃድ ያገኘዉ ልጅ ስም ----------

መረጃ ሰብሳቢ ስም ----------
መጠይቁ የተካሄደበት ቀን ----------የተጀመረበት ሰዓት----------
የመጠይቁ ቁጥር ----------

ክፍልአንድ ፤መሰረታዊ መረጀ የተመለከቱ ጥያቄዎች

ተ.ቁ	ጥያቄ	መልስ	ወደምቀጥለዉጥያቄይ ሂዱ
	የህፃኑ/ዋ መረጃ		
101	ፆታ	1. ወንድ 2. ሴት	
102	የትዉል ድግዜ (ቀን/ወር/ዓመት)	----------/---------/---------	
103	የህፃኑ/ኗእድሜ በወር		
104	የህፃኑ/ዋየዉልደት ቅደምተከተል	1. 1ኛ 2. 2ኛ 3. 3ኛ ከዚያበላይ	
105	የህፃኑ/ዋ ት/ት ደረጃ	1. KG1 2. KG2 3. KG3	
	የወለጅመረጃ		
106	የወለጅ እናት ብቻ ሁኔታ	1. የገበች 2. የፋተች 3. በለዋ በስራ ምክኒያት ወዳ ሌላ አገር የሄደባት 4. በለዋ የሞተባት 5. የለገበ/ች	መልስ 4 ወይም እናቱ የሞተችከሆነወዳ 110 ይሂዱ/አባቱ/ዋ የሞተበት ከሆነወዳ 113
107	ብሔር	1. ሀዲያ 2. ከንባታ 3. ጉራጌ 4. ስልጤ 5. ሌላ (ይገለጽ)----------	
108	ሀይማኖት	1. ፕሮትስታንት 2. ኦርቶዶክስ 3. ሙ ስልም 4. ካቶልክ 5. ሌላ (ይገለጽ)…….	
109	የዉለጅእናትትምህርትደረጃ	1. ያልተማረች (ማንበብናመፃፍየማትችል) 2. የመጀመሪያደረጃ (ከ1ኛ-8ኛ ክፍል) 3. ሁለተኛደረጃ (ከ9ኛ-12ኛ ክፍል) 4. ከሌጅያጠናቀቀች ወይም ከዛበላይ	

110	የዉለጅ አባት ትምህርት ደረጃ	1 .ያልተማረች (ማንበብናመፃፍየማትችል) 2 .የመጀመሪያደረጃ (ከ1ኛ-8ኛ ክፍል) 3 .ሁለተኛደረጃ (ከ9ኛ-12ኛ ክፍል) 4 .ከሌጅ ያጠናቀቀች ወይም ከዛ በላይ	
111	የዉለጅእናትስራሁኔታ	1. የቤትእመቤት 2. የመንግስትሠራተኛ 3. ነጋዴ 4. የቀንሠራተኛ 5. ተማሪ 6. ሌላከላይገለጽ------	
112	የዉለጅ አባትስራሁኔታ	1. የመንግስትሠራተኛ 2. ስራየለያዛ 3. ተማሪ 4. ነጋድ 5. የቀንሠራተኛ 6. ሌላከላይገለጽ------	
113	የቤተሰብብዛት	----------	
	ክፍልሁለት፤የቤተሰብኢኮኖምሁኔታየምመለከተመረጃመሰቢሰቢያቂጽ		
ተ.ቁ	ጥያቄ	መልስ	ወደሚቀጥለው ጥያቄይሂዱ
201	የቤተሰብ የወርአማ ከይ ገቢ በኢትዮጵያ ብር	----------	
	የሚቀጥሉትጥያቄዎችየሚኖሩበትቤትውስጥስለሚገኙንብረቶችናየቤትአሰራርሁኔታይመለከታል		
እባክዎየሚቀጥሉትንጥያቄዎችቤትዎውስጥስለሚገኙንብረቶችናአገልግሎቶችእያሰቡይመልሱ			
1. የቤትንብረትእናአገልግሎቶች			
202	ቴሌቪዥን	1. አለ 0. የለም	
203	ራዲዮ/ቴፕ	1. አለ 0. የለም	
204	ሞባይል/ተንቀሳቃሽስልክ	1. አለ 0. የለም	
205	የቤት (የመስመር) ስልክ	1. አለ 0. የለም	
206	የኤሌክትሪክምድጃ (ስቶቭ)	1. አለ 0. የለም	
207	ማቀዝቀዣ (ፍሪጅ)	1. አለ 0. የለም	
208	የልብስማጠቢያማሽን	1. አለ 0. የለም	
209	ሶፋ	1. አለ 0. የለም	
210	ብስክሌት/ሞተርብስክሌት	1. አለ 0. የለም	
211	መኪና/በጃጅ/ሞተር	1. አለ 0. የለም	
212	የቤት ሰራተኛ	1. አለ 0. የለም	
የቤትአሰራርሁኔታ፡- እባክዎየሚቀጥሉትንጥያቄዎችስለሚኖሩበትቤትአሰራርናሁኔታእያሰቡ ይመልሱ			
213	የሚ ኖሩበት ቤት ባለቤትነቱ የማንነው?	1. የግል 2. የመንግስት (የቀበሌ) 3. ከግለሰብኪራይ 4. ሌላካለይገለፅ--------	
214	የሚ ኖሩበት ቤት ስንት ክፍል አለው?		

216	የሚ ኖሩበት ቤት ጣሪያው ምንድነው?	1. የተፈጥሮቁስ (ለምሳሌሳርወይምእንጨት) 2. ቆርቆሮ 3. ግንብ 4. ሸክላ 5. ሌላካለይገለፅ----------	
217	የሚ ኖሩበት ቤት ወለል ምንድነው?	1. አፈር 2. ጣውላ 3. ሲሚንቶ 4. ሴራሚ ክ (ሸክላ) 5. ሌላካለይገለፅ……	
	ክፍልሶስት ፤ የመኖሪያቤትአካባቢያዊሁኔታንየተመለከቱጥያቄዎች		
	ከዚህቀጥሎያሉትጥያቄዎችስለሚኖሩበትቤትአካባቢያዊሁኔታየተመለከቱናቸው		
301	በህጻኑ/ዋ በመኝታ ክፍሎ ውስጥ ቴሌቪዥንአለ?	1. አለ 0. የለም	የ 202 መልስየለምከሆነወደ 303 ይሂዱ
302	በቀንውስጥ የቴሌቪዥንፕሮግራሞችን በመመልከት ምን ያህልደቂቃ/ሰአትያሳልፋል/ተሳልፋለች?		
303	ከቤትዎእስከ ት/ቤትለመሄድበእግርምን ያህልደቂቃ/ሰአትይፈጅበታል?		
	ክፍልአራት ፤ የአካላዊእንቅስቃሴንበተመለከት		
401	ህጻነ/ዋ በየትኛዉም አይነት አካል ብቃት እንቅስቀሴ ተሳትፎ ያደርጋል/ ተዳርጋለች?	1. አዎ 0. አይደለም	መልሰዎአይደለምከሆነ ወዳክፍልአምስትይሂዱ
402	ለ401 መ ልሰዎ አዎከሆነበአብዛኛዉ በምን አይነት እንቅስቃሴ ይሳተፋል/ትሳተፋለች ይግለጹ		
403	በቀንውስጥ እነዚህን አካላዊ እንቅስቃሴዎች በአማካይ ለምንያህልጊዜ ያዘትራል/ታዘትራለች?		
	ክፍልአምስት ፤ የአመጋገብ እናየጤናልምዶችንየተመለከቱጥያቄዎች		
	የሚቀጥሉትንጥያቄዎችሲመልሱእባክዎባለፈውጊዜያትበአብዛኛውስለነበረዉሁኔታያስቡ		
501	በተለምዶ በቀን ውስጥ ምንያህልሰአትበእንቅልፍያሳልፋል/ታሳልፋለች?		
502	በአብዛኛው ከቤትወዳ ት/ቤት ወይም ከት/በት ወደቤትለመመ ለለስ የምጠቀምበት ሚ ዓዓዣ አይነት?	1. የእግርጉዞ 2. ብስክሌት 3. የህዝብመጓጓዣ(በጃጅ፣አውቶቢስ 4. ኮንትራትታክሲ/የት/ቤትአውቶቢስ 5. የግልመኪና	
503	በተዉለዳ/ች የመጀመሪያ 6 ወራትየተመ ገባ/ች ም ግብዓይነት	1. የእናት ጡት ዉተት ብቻ 2. የእናት ጡት ዉተትናሌሎችምግቦች 3. የተሸጉ ዉተት/ፎርሙላዉተት/ 4. ሌላከለይገለጽ----------	
504	በተለምዶ ቁርስበምንያህልጊዜ ይበላል/ትበላለች?	1. በየቀኑ (ሁልጊዜ) 2. አብዛኛውንጊዜ 3. አንዳንድጊዜ 4. በልቼአላውቅም	
505	በተለምዶ ምሳ በምን ያህል ጊዜ ይበላል/ትበላለች?	1. በየቀኑ (ሁልጊዜ) 2. አብዛኛውንጊዜ 3. አንዳንድጊዜ 4. በልቼአላውቅም	
506	በተለምዶ መክሰስበ ምንያህልጊዜ	1. በየቀኑ (ሁልጊዜ)	

	ይበላል/ትበላለች?	2. አብዛኛውንጊዜ 3. አንዳንድጊዜ 4. በልቼአላውቅም	
507	በተለምዶ በቀን ውስጥ መክሰስ ስንት ጊዜ ይበላል/ትበላለች?	1. ከ አንድጊዜበታች 2. አንድጊዜ 3. ሁለትጊዜ 4. ሶስትጊዜ 5. ከሶስቴበላይ	
508	በተለምዶ እራት በምን ያህል ጊዜ ይበላል/ትበላለች?	1.በየቀኑ (ሁልጊዜ) 2. አብዛኛውንጊዜ 3. አንዳንድጊዜ 4. በልቼአላውቅም	

ክፍል6 የተለያዩምግብአይነትስለመመገቡ/ቧ የምዳስስመጠይቅ፤-

	የምግብ ምድብ	በአከባቢዉ የም ገኙ የምግብ አይነት	ህጻኑተመግበዋል 1= አዎ 0 =አይደለም
601	እህል / ስራስር	ዳቦ፣እንጀራ፣ ሩዝ፣ ፓስታ፤ መኮርኖ፤አጥምት ወይምሌሎችየእህል / ጥራጥሬውጤቶች	1= አዎ 0 =አይደለም
602	በቨታሚን ኤ የበለጸጉምግቦች	መንጎ፤ ፓፓያእናከነዚህየተዘጋጁጁስ፤ ካሮት፤ የስኮርድንች	1= አዎ 0 =አይደለም
603	ሌሎችፍራፍሬናአትክልት	ትማትም፤ ሽንኩርት	1= አዎ 0 =አይደለም
604	ሥጋ፤ዓሰ፤	የከብት፤ የፍየል፤ የበግ፤የዶሮሥጋእናሌሎችከሥግየተሰሩምግቦች	1= አዎ 0 =አይደለም
605	እንቁላል	እንቁላልወይምከእንቁላልየተሰሩምግቦችለምሳሌበእንቁላልየተሰረደቦ……	1= አዎ 0 =አይደለም
606	ጥራጥሬ	በቆላ፤ አተር፤ ምስር ፤ለዉዝእናከነዚህየተሰሩምግቦች/ ሽሮዉጥ፤ክክዉጥ፤ሚስርዉጥ፤በቆላአሽኩር	1= አዎ 0 =አይደለም
607	ዉተትእናየዉተትዉጤቶች	ዉተት፤ አይብ፤ እርጎ፤ ሌሎችየዉተትዉጤቶች/ እጎት……./	1= አዎ 0 =አይደለም
608	ቅባትምግቦች	ዘይት፤ ቅቤእናከነዚህየተሰሩምግቦች	1= አዎ 0 =አይደለም

ክፍል 7 የሰዉነትመጠንልኬት

የህጻኑመለያቁጥር,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

ተ.ቁ	የሰዉነትመጠንልኬት	ንባብ
701	ቁመት (በሴንቲሜትር)	
702	ክብደት (በኪሎግራም)	

ስለትብብርዎ በጣም እናመሰግናለን!

የቃለመጠይቁዉጤት

1. ሙሉበሙሉየተሞላ
2. በከፍልየተሞላ
3. ምንምያልተሞላበተቆጣጣሪተረጋግጧል። ስም -------------------------ፊርማ----------------------------

ስም ------------------------ፊርማ---------------------------

APPEDIX IV: Ethical approval and supportive letters

JIMMA UNIVERSITY
ጅማ ዩኒቨርሲቲ

ቁጥር
Ref. No IHRPGO/755/2019
ቀን
Date 25/02/2019

Institutional Review Board (IRB)
Institute of Health
Jimma University
Tel: +251471120945
E-mail: zeleke.mekonnen@ju.edu.et

To: Tamirat Hundito

Subject: Ethical approval of research protocol

The IRB of institute of health has reviewed your research project entitled:

"Prevalence and factors associated with overweight among private kindergarten School children"

This is to notify that this research protocol as presented to the IRB meets the ethical and scientific standards outlined in national and international guidelines. Hence, we are pleased to inform you that your protocol is ethically cleared.

We strongly recommended that any significant deviation from the methodological details indicated in the approved protocol must be communicated to the IRB before they are implemented.

With regards!

Zeleke Mekonnen (PhD)
Associate Professor, Health Research and Postgraduate Director

Institute of Health Jimma University

Tel.+251-47 11 114 57 Fax: +251 4711114 50 P.O.Box. 378 E-mail:ero@edu.et
PBX:+251471111458-60 +251471112040 JIMMA,ETHIOPIA website:http://www.ju.edu.et

JIMMA UNIVERSITY
ጅማ ዩኒቨርሲቲ

ቁጥር
Ref. No [illegible]
ቀን
Date 18/01/2011 ዓ.ም

ለ --

ጉዳዩ:- ***<u>ትብብር ስለመጠየቅ::</u>***

ዩኒቨርስቲያችን ውስጥ ከሚካሄዱ ጥናቶች መካከል **"Prevalence and factors associated with overweight among private kindergarten School children"** በሚል ርዕስ ምርምር ጥናታቸው የሚሰሩ መሆኑን እየገለጽን ለተመራማሪው/ዋ **<u>ታምራት ሁንዴ</u>** እና ለመረጃ ሰብሳቢዎቻቸው አስፈላጊው ትብብር እንዲደረግላቸው በትህትና እንጠይቃለን::

"ከሠላምታ ጋር"

Health Research and Postgraduate Director
Institute of Health Jimma University

Tel.+251-47 11 114 57 PBX:+251471111458-60 Fax: +251 4711114 50 +251471112040 P.O.Box. 378 JIMMA,ETHIOPIA E-mail:ero@edu.et website:http://www.ju.edu.et

በደቡብ ብሔሮች ብሔረሰቦች ክልላዊ መንግሥት
በሀድያ ዞን የሆሳዕና ከተማ አስተዳደር ትምህርት ጽ/ቤት
Southern Nations, Nationalites and People's Regional State
Hadiya Zone Hossana Town Administration Education Office

ቁጥር ________
ቀን ________

ለ ________ ት/ቤት

ሆሳዕና

ጉዳዩ፡- የድጋፍ ደብዳቤ ስለመስጠት ይሆናል

ከላይ በርዕሱ ለመግለጽ እንደተሞከረው አቶ ታምራት ሁንዴቶ በጅማ ዩኒቨርሲቲ የኢፒድምሎጂ ተማሪ ስሆኑ በሆሳዕና ከተማ አስተዳደር ትም/ጽ/ቤት ስር በተመረጡ በ፱ የግል አጸደ ህጻናት ት/ቤቶች በመማር ላይ ባሉ ተማሪዎች ላይ ጥናት እየደረጉ ስለሆነ የሚፈልጉትን መረጃ በመስጠት የተለመደ ትብብር እንድያደርጉ ይህንን የድጋፍ ደብዳቤ የሰጠናቸው መሆኑን እንገልጻለን፡፡

ከሠላምታ ጋር!!

ታደለ ሊሬ

የት/መ/ሥ/አ/ዳ/ባለሙያ ተወካይ

ግልባጭ፡-

- ✓ ከጽ/ቤታችን ኃላፊ ቢሮ
- ✓ ለት/መ/ሥ/አ/ዳይሬክቶሬት

ሆሳዕና

Tel 046 555 2492 ጥራት ያለው ትምህርት ለሁሉም !! FAX 046 555 3514