World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

OBESITY BETWEEN PRIMARY SCHOOL CHILDREN VISITING KARBALA TEACHING HOSPITAL "CROSS-SECTIONAL STUDY"

Razzaq Abbood Salman Al.Yasari
M.B.CH.B,D.C.H
KARBAL A TEACHING HOSPITAL FOR CHILDREN
wayt45649@gmail .com
Sabeeha Sahib Hadi Husein Hillawi
M.B.CH.B,D.C.H
KARBAL A TEACHING HOSPITAL FOR CHILDREN
bestbeastway@gmail .com
Ahmed Mohammed Ali Mohsen Al.Husseini
M.B.CH.B,D.C.H
KARBAL A TEACHING HOSPITAL FOR CHILDREN
ahm39ster @gmail .com

Article history:

Received: September 4th 2022
Accepted: October 4th 2022
Published: November 8th 2022

Abstract:

"Overweight" technically refers to an excess of body weight, whereas "obesity" refers to an excess of fat.Childhood obesity is a growing problem and an increasing public health concern in the developed countries. Even more worrying is the increasing prevalence of obesity in developing countries. Childhood obesity is a well-recognized problem all over the world. Obesity can cause other medical problems in childhood, adolescence and adulthood.

Methods The study has been conducted in primary - schools children attending Karbala Teaching Hospital from different residency (urban and rural areas). The current work represented an observational cross-sectional study which was conducted during the period extending from the first of july 2021 to the end of july 2022, with regular working hours.

Results The total sample studied in this research was (300) of the Primary child. The age group was taken from 7 years and above.

Conclusions: The prevalence of overweight and obesity among primary school children attending KTH was48 cases (16%) and20cases (6.7%), respectively.

Aim This study aim to assess the health of children and detection some of the risk factors and problemes of obesity for better child welfare.

Keywords: Obesity, (KTH) Karbala Teaching Hospital, Body Mass Index (BMI) , Age.

INTRODUCTION.

Obesity in children is one of the most wide spread medical problems now. Obese children are more likely to be obese adults. Increasing prevalence of overweight and obesity is an important public health problem contributing to significant excess in morbidity and mortality. (1)

Obesity generally is defined as an excess amount of body fat. That means the Body Mass Index (BMI) is above 30 for adults. Modified BMI for age was used to define obesity in children, BMI >85 percentiles is considered as overweight, BMI > 95 percentiles is considered as obese, where as the normal weight range is between 5 percentiles - >85 percentiles and under weight is below 5 percentiles (2).

Obesity during childhood is associated with a number of cardiovascular risk factors, including hyperinsulinism and insulin resistance, hypercholesterolemia, hypertriglyceridemia, reduced levels of high density lipoprotein (HDL), and hypertension . (3)

Many different factors contribute to the development of obesity mainly the imbalance between calorie intake or consumption, and energy expenditure beside the genetic factors. Obese parents may have obese children due to shared genes and environment such as availability of certain energy rich food and decreased exercise and physical activities (4).

The tendency towards obesity is fostered by lack of physical activity combined with high-calorie, low-cost foods. Low activity levels and excessive television

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

watching were strongly related to overweight status. Possible causes of obesity include diet composition, physical activity level, feeding behaviour, endocrine and genetic factors, psychological traits, and exposure to broader environmental factors [5].

Factors contributing to the problem include eating food away from home, consuming large or excessive quantities of soft drinks and snack foods, and large portion sizes [6].

Increases in energy intake are observed in genetic syndromes, such as Prader- Willi syndrome, Cushing syndrome, drug-induced obesity, and certain mutations in genes that control appetite. Reductions in energy expenditure characterize hormonal deficiency states, including hypothyroidism and growth hormone deficiency [7].

The objectives of this study are to:
1.Determine sociodemographic criteria of this group.

2.Recognize the prevalence of obesity among primary-school ages.

3.Assess the nutritional status of primary- school children (by using parameters).
4.Identify some of the risk factors of obesity and main complications in our samples.

DEFINITIONS

"Overweight" technically refers to an excess of body weight, whereas "obesity" refers to an excess of fat. However, the methods used to directly measure body fat are not available in daily practice. For this reason, obesity is often assessed by means of indirect estimates of body fat [6].

The body mass index (BMI) is the accepted standard measure of overweight and obesity for children and adults [7]Body mass index provides guideline for weight in relation to height and is equal to the body weight divided by the height squared. Other measures of childhood obesity, including weight-for-height which is particularly useful for the child younger than three years) and measures of regional fat distribution (eg, waist circumference and waist-to-hip ratio)skin fold thickness[6].

The term "obesity" refers to children with body mass index (BMI) >95 percentile for age and sex and the term "overweight" refers to children with body mass index (BMI) between the 85th and 95th percentile for age and sex.

The National Center for Health Care StatisticsCenter for disease control published BMI reference standarad for children between the ages of 2 and 20 years. As children approach adulthood, the 85th and 95th percentile BMI for age and sex are approximately 25 and 30, the thresholds for over weight and obesity in adults, respectively [8].

Polygenic models

The polygenic mouse models of obesity have allowed identification of multiple genetic loci within individual strains that modify obesity, plasma cholesterol levels, specific deposition of body fat depots and propensity toward development of obesity on high fat diet. These polygenic models more closely resemble the human obesity phenotypes than single gene models; however, the single gene defects producing recessive traits, dominant traits, promoter alterations, and those subject to parental imprinting must also be considered candidates for genetic effects in human obesity[10].

DIAGNOSIS

The BMI is the most effective tool for the assessment of overweight and obesity in children. It correlates with adiposity [11]complications of childhood overweight .
The Center for Disease Control (CDC) uses the terms "at risk of overweight" and "overweight" for children with BMI between the 85th and 95th percentile and >95th percentile for age and sex, respectively. The CDC describes children whose weight is between the 85th

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

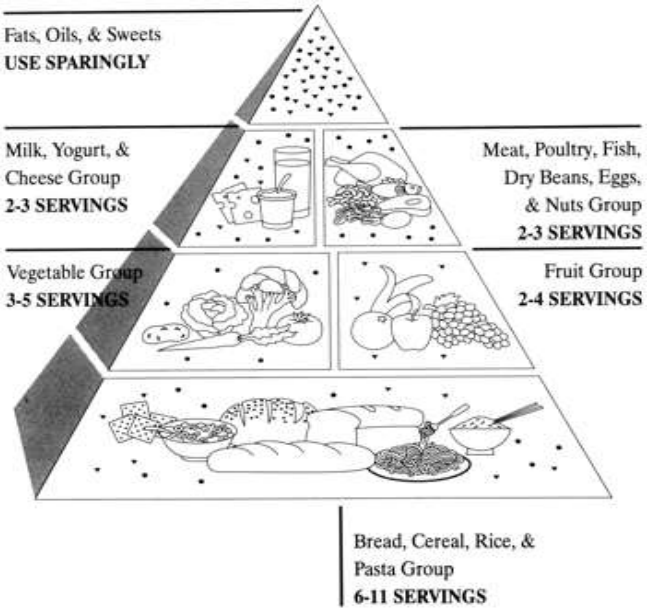
and 95th percentile for age and sex as "at risk of overweight".

Overweight

The CDC uses the term "overweight" to describe children whose weight is >95 percentile for age and sex, whereas other experts use this term to describe children whose weight is between the 85th and 95th percentile for age and sex. Obese — Some experts, including the Institute of Medicine of the European perspective use the term "obese" to describe children whose weight is >95 percentile for age and sex[12]. The CDC does not use the term "obesity" in describing childhood weight categories because they feel that the term obesity is interpreted by children to be pejorative[13].

Table1-1 Causes ofObesity [29]

Functional	
Simple obesity	Excessive dietary intake Lack of exercise/mobility (Spina bifida, muscular dystrophy)
Organic	
Hypothalamic disturbance	Pituitary tumors
Hyperphagic syndromes	Prader-Willi syndrome Laurence-Moon-Biedl syndrome
Corticosteroid excess	Cushing's (iatrogenic, pituitary , and adrenal)
Hypothyroidism	Thyroid failure
Chromosomal	Down syndrome Klinefelter's syndrome
Cerebral disease	Tumors, infection, hydrocephalus



World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

Figure A- Food Guide Pyramid

3: PATIENTS AND METHODS:

3.1.1: Administration and Ethical considerations:

Official permission to carry out this study was obtained from family before the study

3.1.2: Socio-Demographic Characteristic:

The study has been conducted in primary - schools children attending Karbala Teaching Hospital from different residency (urban and rural areas).

3.1.3: Design of Study:

The current work represented an observational cross-sectional study which was conducted during the period extending from the first of july 2021 to the end of july 2022, with regular working hours.

3.1.4: Development of questionnaire;

The questionnaire was developed to collect all data relevant to socio-demographic factors. (Appendix I)

3.1.5: Data Collection:

The study includes two components: interviewer administration of questionnaire and anthropometric measurements(Ht,Wt,Blood pr). Prior to the interview, the purpose of data collection was explained and consent was obtained. The children were interviewed and examined at consulting room of Karbala Teaching Hospital.The sample done by selecting achild out everyfor children.

3.1.7: Inclusion and Exclusion Criteria:

1 Inclusion criteria:

Primary's children with the age of more than 7 years old had been included in the sample

2. Exclusion Criteria

child diagnosed to have a medical condition that may cause overweight or obesity like nephrotic syndrome or those who are taking drugs like steroids had been excluded from the study.

3.1.7: Examination:

1. Weight:

All children were weighed wearing minimal clothing without shoes to the nearest of 100g using UNICEF Seca personal scales that are checked regularly and routinely before recording the weight of each children and the pointer was adjusted to zero.[6]

2. Height:

Height was measured with the children standing at ground level without footwear to the nearest of 0.1 cm against the wall as a vertical tape fixed perpendicular to the ground on the wall was used as scale. This tape was of non-stretchable fibreglass. It was fixed with transparent tape and care was taken to see that there were no folds or tilting to any side. Contact point includes head, shoulder, buttocks, knee and feet. During the examination also the scale was repeatedly checked for loosing of adhesive tapes or tilting of the scale.[6]

4. BLOOD PRESSURE:

Blood pressure was measured using standardized sphygnomanometer when the children was sitting comfortable after explaining that the procedure is not harmful to them and the device at the level of heart.

Blood pressure was checked 2 times for each children and readings were recorded and classified into normal, prehypertensive and hypertensive according to standard tables. (Appendix VI).

5. Random Blood Sugar:

Blood sugar was measured using ACCU-CHEK® Active meter system after assuring the children that the procedure is not harmful and brief.

Readings were classified into two groups, below 200 mg/dl and above 200 mg/dl.[62]

3.1.8: Data Interprimarytation:

BMI was calculated as weight (kg) divided by height squared (m). [63, 64] The classification of nutritional status depending on BMI cut-off points into four groups: underweight, normal, overweight and obesity following the recommendation cut-off point of WHO.[64] This cut-off points are:, BMI < 18.5 for underweight, BMI 18.5 to 24.9 for normal weight, BMI 25 to 29.9 for overweight and BMI ≥ 30 for obesity.

3.2: Statistical Analysis:

Data entry and analysis were done using the SPSS program, version 11. Comparison of proportions was performed using chi square, P-value of less than 0.05 was considered as statistically significant, P-value <0.01 as highly significant and <0.001 as extremely significant.

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

Appendix I

Questionnaire

1- Name: 2- Age:

3- Sex: Male , ☐ female ☐

4-Sequency in family

5- Residence: Urban , ☐ rural ☐

6- Social Class: Father's educational level: ☐

Mother's educational level: ☐

Father's job: ☐

Mother's job: ☐

Crowding Index: / =

Level: High ☐ Midldle ☐ Low ☐

7-Family History Of: A-Obesity: Positive ☐ ,Negative ☐

8-Drugs History and chronic diseases:

9-Complications: A-Blood pressure: /

B-Random blood sugar: mg/dl

10-Body weight: Kg

11-Height: Cm

12- Body mass index(B.M.I):

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

4.RESULTS

4.1. Demographic characteristics of the study:

The total sample studied in this research was (300) of the Primary child. The age group was taken from 7 years and above. The child was recorded in the data collection of the sample in which (146) of the children has been living in urban areas representing 48.7% of the total sample, (154) children have been living in rural areas representing 51.3% of the total sample in the research. The sex of child was also recorded, male students were 163(54.3%), and female students were 137 (45.7%).

Table4.1:Distribution of the sample siz according to Residenc and gender

Sample	No. of children	%
Residence		
Urban	146	48.7%
Rural	154	51.3%
Tota	300	100%
SEX		
Male	163	54.3%
Female	137	45.7%
Total	300	100%

4.2. Relationship between B.M.I and Residency:

The prevalence of nutritional status was distributed differently according to the residence.

Table (4.2) shows that urban areas have more cases of overweight 42(28.7%) and obesity 14(9.5 %) than rural areas in which overweight students were7(4.5%) and obese child were 5(3.2) respectively .

Table (4.2): Relationship between the BMI and Residency

B.M.I	Residency					
	Urban		Rural		Total	
	No.	%	No.	%	No.	%
Underweight	6	2	18	6	24	8
normal weight	84	28	124	41.3	208	69.3
overweight	42	14	7	2.4	49	16.3
obese	14	4.6	5	1.7	19	6.4
Total	146	48.6%	154	51.4%	300	100%

4.3. Relationship between B.M.I and Age:

Concerning the age of children and its relations to B.M.I the study found that obesity and overweight weight tend to be more prevalent with increasing age as shown in table (4.3)

Table (4.3): Relationship between BMI and Age Groups

BMI	Age(years)									
	6-<7		<8->9		<10>11		≥12		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Underweight	4	1.3	2	0.6	16	5.3	5	1.7	27	9
normal weight	54	18	68	22.7	38	12.7	45	15	205	68.3
overweight	14	4.7	3	1	15	5	16	5.3	48	16

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

obese	3	1	3	1	5	1.7	9	3	20	6.7
Total	75	25%	76	25.3 %	74	24.7 %	75	25%	300	100%

4.4. Relationship between B.M.I and Sex:

Regarding sex of children overweight and obesity were found to be more prevalent among female child. For overweight there were 39cases (28.4%) and10 cases (6.1 %) for females and males respectively. Mean while obesity accounts for 11 cases (6.8%) and 11 cases (8%) for females and males respectively as shown in table (4.4)

Table (4.4): Relationship between BMI and Sex.

BMI	sex					
	male		female		Total	
	No.	%	No.	%	No.	%
Underweight	9	3	12	4	21	7
normal weight	133	44.3	75	25	208	69.3
overweight	10	3.3	39	13	49	16.3
obese	11	3.7	11	3.7	22	7.4
Total	163	54.3%	137	45.7%	300	100%

4.5. Relationship Between B.M.I and Social Class:

Regarding social class and it's to relation nutritional status; the following table shows that obesity and overweight are more common in high social level 13 cases (17.3%) and 21cases (28%) respectively.

Table (4.5): Distribution of the Cases According to the BMI and social class

BMI	Social class							
	High		Middle		Low		Total	
	No.	%	No.	%	No.	%	No.	%
Underweight	2	0.6	17	5.7	7	2.3	26	8.7
normal weight	39	13	87	29	81	27	207	69.
overweight	21	7	8	2.6	11	3.7	40	13.3
obese	13	4.4	9	3	5	1.7	27	9
Total	75	25%	121	40.3 %	104	34.7%	300	100%

4.6. Relationship between B.M.I and Family History :

Regarding the nutritional and it's relation to obesity and overweight the following table shows that overweight counts for 34cases (44.7%) of those with positive family history and obesity counts (23.7%)18cases of them. While those with a negative family history count for (5.8%)13cases and 2cases(%0.8) for overweight and obesity respectively .as showed in table (4.6).

Table (4.6): Relationship between BMI and Family History.

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

BMI	Family history					
	+vet		-ve		Total	
	No.	%	No.	%	No.	%
Underweight	0	0	24	8	24	8
normal weight	24	8	185	61.7	209	69.6
overweight	34	11.3	13	4.4	47	15.7
obese	18	6.	2	0.6	20	6.7
Total	76	25.3%	224	74.7%	300	100%

4.7. Relationship between B.M.I and Type of Diet:

Table (4.7) show that children who eat meals and snacks are liable to be obese or overweight, it show that the number of overweight child who eat meals and snacks is51 cases (60%) and obese child is 15cases(17.7%) which is more than those who only eat 3 meals per day.

Table (4.7): Relationship between BMI and diet

BMI	Diet					
	Just meals		Meals &snacks		Total	
	No.	%	No.	%	No.	%
Underweight	23	7.7	1	0.3	24	8
normal weight	170	56.7	18	6	188	62.7
overweight	16	5.3	51	17	67	22.3
obese	6	2	15	5	21	7
Total	215	71.7%	85	28.3%	300	100%

4.8. Relationship between B.M.I and Blood Primaryssure:

This table shows that pre.hypertensive and hypertensive children are as follow 6 cases (50%) and 6 cases (33.3%) for overweight and fore (61.1%) cases 11 and(25%)cases 3 obese children respectively which was higher than those who are normal or underweight.

Table (4.8): Relationship between BMI and Blood Pressure.

BMI	Hypertension							
	Normal		Prehypertension		Hypertension		Total	
	No.	%	No.	%	No.	%	No.	%
Underweight	25	8.3	0	0	0	0	25	8.3
normal weight	203	67.7	3	1	1	0.3	207	69.
overweight	37	12.3	6	2	6	2	49	16.3

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

obese	5	1.7	3	1	11	3.7	19	6.4
Total	270	90%	12	4%	18	6%	300	100%

4.9. Relationship between B.M.I and Random Blood Sugar Measurement:

This table shows increased number of children having high random blood sugar measurement among those who are considered to be obese or overweight 3 cases (42.8%) and 3 cases (42.8 %) respectively.

Table (4.9): Distribution of the Cases According to the BMI and DM

BMI	DM					
	<200		>200		Total	
	No.	%	No.	%	No.	%
Underweight	27	9	0	0	27	9
normal weight	202	67.3	1	0.3	203	67.6
overweight	47	15.7	3	1	50	16.7
obese	17	5.7	3	1	20	6.7
Total	293	97.7%	7	2.3%	300	100%

5.DISCUSSION

The use of BMI for assessing nutritional status is now being applied worldwide. Body mass index cut off points was linked to adult cut off points to measure the nutritional problems.

The present study was the first carried out in Karbala city to assess the prevalence of obesity among Primary children. Therefore, the methods & results developed would be useful as basic information in further studies among this age group. The present study had several strengths including a sociodemographic sample (urban & rural), simple anthropometric measurements in addition, the results has been adjusted for age.

5.1. Distribution of different Nutritional Status in The Study:

By comparison, the prevalence of overweight and obesity in the current study were higher than that reported from K.S.A, where over weight and obesity for age group 7-12 years were 11.0 % and 5.9% respectively.[65] The prelence of obesity in this study was more than in Qatar, they reported that, 3.2% and 8.8% were overweight, and 1.6% and 5.4% of both boys and girls were obese, respectively. The prevalence of obesity was less than in Kuwait. The BMI of Kuwaiti children at higher percentiles and was higher than that of Saudi taking into consideration the difference in developmental habits and prosperity between Iraq and these countries and this difference again can be explained by the change in social, economic, number of population within the country together with genetic susceptibility, change in body image & availability of energy dense diet as important differences between developing & industrialized countries.[66]

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

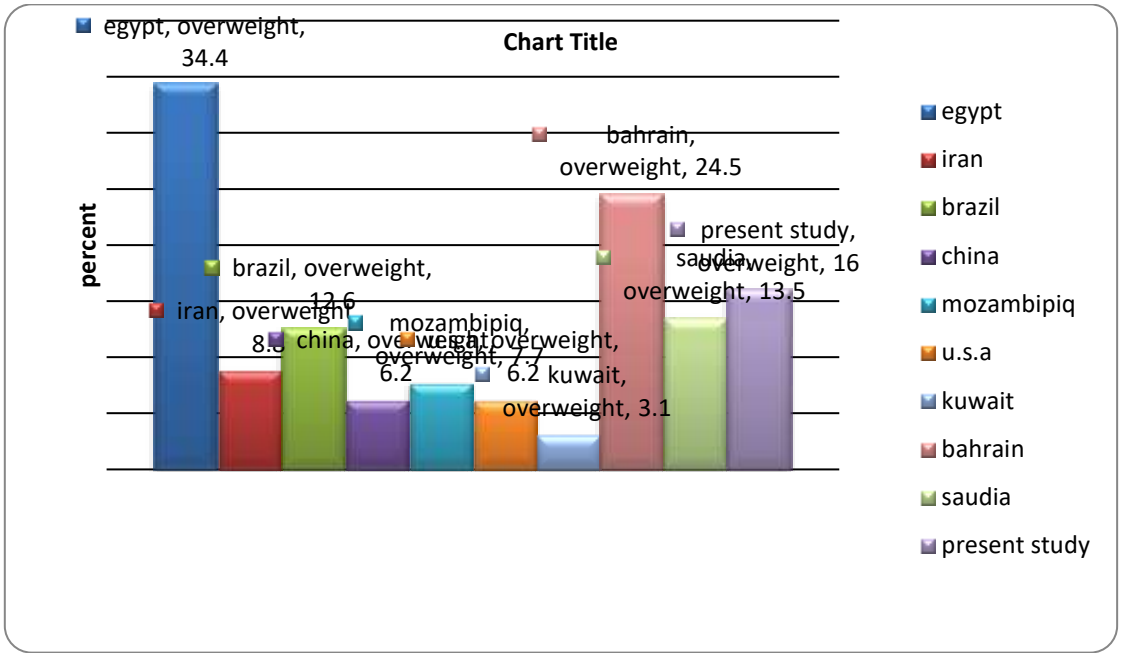


Figure (1): Comparison of the current study Result in Overweight Prevalence with Other Countries.

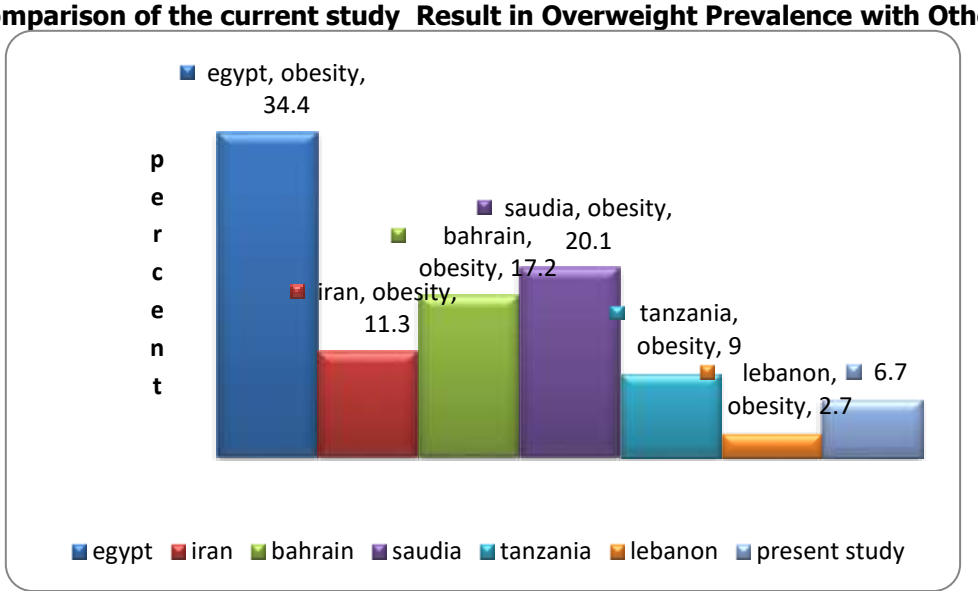


Figure (2): Comparison of the current study result in obesity prevalence with other countries. ()

5.2. B.M.I and Age:

The current study demonstrated that the prevalence of overweight and obesity significantly increased with age.

The proportion of overweight and obesity increased from (4.7%) and (1%) at age 2 reaching (5.3%) and (3%), respectively, at the age of 7 years and above. This may give the impre ssion that obesity is a progressing phenomenon that once present, tends to increase with time. This is consistent with a study of children in primary schools in Leeds, which found a significant increase in the proportion of overweight and obese children at age.[67] It is also in agreement with Sanjay et al, who found in 20 973 children aged 1–9 years that the prevalence of obesity increases with age, being almost double in the oldest age quarter, compared with youngest age quarter[68].

5.3. B.M.I and Sex:

In the current study, although the prevalence of overweight was higher in girls than in boys, it was statistically not significant (13% vs. 3.3%).

This finding does not coincide with Nicolas et al in their cohort study of African Americans, which concluded that female sex is an independent risk factor [69].

5.4. B.M.I and Residence

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

The prevalence of overweight was significantly higher in urban areas than in rural areas (14% vs. 2.4%) in current study. This was in agreement with Zuguo et al in the USA, who observed an increase in the prevalence of overweight among both urban and rural children [70], although trends were more marked and consistent in the urban areas. Our results also agree with Fredrik et al, [71] a study in the Netherlands, who concluded that obesity is more prominent in urban than rural areas. This observation may be due to more food and less physical activity in urban areas.

5.6. B.M.I and Dietary Habits:

Eating more than three meals per day was significantly related to the BMI, the study demonstrated that the percentage of obese and overweight children (eating more than three meals per day) was 5%,.2% more than those with normal weight (56.7% vs. 6%).

The high BMI associated with these dietary habits in our sample does not agree with some studies, which concluded that obese children do not eat differently than their peers. Eating between meals was significantly related to high BMI.

5.7. B.M.I And Social Level :

The study showed a significant association between BMI and social level. Increased BMI in children seems to be associated with a high social level of the parents..This result is in disagreement with Fredrik et al, who found increased BMI values in children with lowest social level,[71] but agree with a study done by Mihaela et al[72] in the USA where mothers of obese children were not different from mothers of non-obese children in education. This may attribute also to the fact that higher social levels in Iraq never mean that they have the sound medical awareness and knowledge like those in developed countries.

5.9.B.M.I And Blood Pressure:

The current study shows a significant association between high B.M.I and elevated blood pressure when (3.7%) of obese children are considered to be hypertensive and (1%) were prehypertensive and this result agrees with (Muntner P. etal.) Who found a strong association between high blood pressure and obesity among children. [73] The prevalence of HT in the current study study ranks less than those reported in Arabian countries. Meanwhile, it is less than those reported in foreign
Countries.[74] These differences may be attributed to variations in study design, definition of HT, methods of BP recording, observer effect, age range, sample size and social class.

5.10. B.M.I and Blood Sugar:

The current study shows that overweight children having increased random blood sugar measurement. This result signifies that overweight and obesity are considered to be important risk factors for diabetes mellitus in children. This result agreed with (Eric Ravussin and Boyd A. Swindurn) who found that Overweight children and adolescents are now being diagnosed with impaired glucose tolerance and type2 diabetes, and they show early signs of the insulin resistance syndrome and cardiovascular risk. [75]

Ranjana Sinha, M.D concluded that Childhood obesity,which is epidemic in the United States, has been accompanied by an increase in the prevalence of type 2 diabetes among children and adolescents and that impaired glucose tolerance is highly prevalent among children and adolescents with severe obesity, irrespective of ethnic group.[76]

6.1: CONCLUSIONS:

6.1.1. The prevalence of overweight and obesity among primary school children attending KTH was48 cases (16%) and20cases (6.7%), respectively.
6.1.2. Over weight were more common in females39 (13%) than males10 (3.3%).
6.1.3obesity equal in females11cases(3.7%) and11cases in male(3.7%).
6.1.4. All the kinds of nutritional status were higher in urban than rural areas.
6.1.5. The associated risk factors in this study were: dietary habits, family history, and social level.
6.1.6. Complications of obesity and overweight were high blood sugar and high blood pressure.

6.2: RECOMMENDATIONS:

Part 1- for feeding

Improving nutritional quality after weaning:

- Orientation of the medical staff of the primary health care center, together with pediatricians for detection and evaluation 0f overweight Primary children ,and proper referral when indicated.
- Introduce healthy foods and continue offering it, if initially refused. Parents should not introduce foods without overall nutritional value simply to provide calories.
- Respond to satiety clues and do not overfeed; infants and young children can usually self-regulate total caloric intake; do not force children to finish meals if not hungry, because they often change caloric intake from meal to meal.

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

Part 2 for parents:

- For children aged > 2 year, parents and caregivers should follow special dietary recommendation for healthy feeding which include:
  - ❖ Enhancing eating vegetables and fruits daily, limit juice intake,and Eating whole-grain breads and cereals rather than refined-grain products.
  - ❖ Reducing the intake of sugar-sweetened beverages and foods.
- For treatment of obesity, intervention should begin early with gradual changes, and the clinician should involve the family and all caregivers in the treatment program.
- Clinician should educate families about medical complications of obesity and long term risk of obesity.

Part 3 for ministry:

- . To ministry of higher education to do more researches on this field all over our country in order to:

REFERENCES:

1- Ogden CL, Flegal KM, Carroll MD, Johnson CL. Primaryvalence and trends in overweight among US children and adolescents, 1999-2000. JAMA 2002; 288:1728.
2-Jolliffe D. Extent of overweight among US children and adolescents from 1971 to 2000. Int J Obes Relat Metab Disord 2004; 28:4.
3-Dietz WH, Robinson TN. Clinical practice. Overweight children and adolescents. N Engl J Med 2005; 352:2100.
4- Fowler-Brown A. & Kahwati L.C. Primaryvention and treatment of overweight in children and adolescents. American Family Physician, (2004, June 1); 69(11):2591-2598.
5-Serdula M.K. Ivery D., Coates R.J., Freedman D.S., Williamson D.F., & Byers T. Doobese children become obese adults? A review of the literature. Primaryventive Medicine(2003, March);, 22(2):167-177.
6-Flodmark CE, Lissau I, Moreno LA, et al. New insights into the field of children and adolescents' obesity: the European perspective. Int J Obes Relat Metab Disord 2004; 28:1189.
7-Deurenberg P, Weststrate JA, Seidell JC. Body mass index as a measure of body fatness: age- and sex-specific primarydiction formulas. Br J Nutr 2000; 65:105.
8-Baker S, Barlow S, S, Cochran W, et al. Overweight children and adolescents: a clinical report of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. J Pediatr Gastroenterol Nutr 2005; 40:533
9- Stubdal H, Lynch CA, Moriarty A, Fang Q, Chickering T, et al.Targeted Deletion of the tub Mouse Obesity Gene Reveales that tubby Is a Mutation. Mol Cell Biol 2000 ;20(3):878-882.
10-Armstrong J, Dorosty AR, Reilly JJ. Coexistence of social inequalities in under nutrition and obesity in Primary children :population based cross sectional study. Archives of Disease in Childhood 2003;88:671-675.
11- Must A, Jacques PF, Dallal GE, et al. Long-term morbidity and mortality of overweight adolescents. A follow-up of the Harvard Growth Study of 1982 to 1995. N Engl J Med 2002; 327:1350. .
12- Bender R, Trautner C, Spraul M, Berger M. Assessment of obesity. Am J Epidemiol 2002; 147: 42-48.
13-Cole TJ, Mary CB, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. BMJ2000;320:1240.
14 Hedley AA, Ogden CL, Johnson CL, et al. Primaryvalence of overweight and obesity among US children, adolescents, and adults, 1999-2002. JAMA 2004; 291:2847.
15- United States Department of Health and Human Services, Center for Disease Control and Primaryvention,National Center for Health Statistics. (2002). 2002 Pediatric Nutrition Surveillance Survey, growth
indicators by race/ethnicity and age; children aged <5 years.2002 ;14:109-115.
16-Hancox RJ, Milne BJ, Poulton R. Association between child and adolescent television viewing and adult health: a longitudinal birth cohort study. Lancet 2004; 364:257.
17-Ludwig DS, Gortmaker SL. Programming obesity in childhood. Lancet 2004; 364:226.
18-Strauss RS, Pollack HA. Epidemic Increase in Childhood Overweight, 2004JAMA; 286:2845.
19. Ball GDC, McCargar LJ. Childhood obesity in Canada: A review of primaryvalence estimates and risk factors for cardiovascular diseases and type 2 diabetes Can J Appl Physiol. 2003;28:117–140.
20-van Dam RM, Willett WC, Manson JE, Hu, FB. The relationship between overweight in adolescence and primarymature death in women. Ann Intern Med 2006; 145:91.
21-Power C, Lake JK, Cole TJ. Body mass index and height from childhood to adulthood in the 1958 British born cohort. Am J Clin Nutr2000; 66:1094.
22- Leibel RL, Chua SC, Rosenbaum M. Obesity. In: The Metabolic and Molecular Bases of Inherited

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

Disease, 8th ed, Scriver, CR, Beaudet, AL, Sly, WS, Valle, D editors, McGraw-Hill, New York, 2001. p. 3965..
23-Parsons TJ, Power C, Logan S, Summerbell CD. Childhood primarydictors of adult obesity: a systematic review. Int J Obes Relat Metab Disord 2000; 23 Suppl 8:S1.
24-Shubair Kleinman, R (Ed), Pediatric Obesity. In: Pediatric Nutrition Handbook, 5th ed, American Academy of Pediatrics, Elk Grove Village, IL, 2004. p. 551.
25-Mellits ED, Cheek DB. The assessment of body water and fatness from infancy to adulthood. Monogr Soc Res Child Dev 2000: 35:12.
26-Canning PM, Courage ML, Frizzell LM. Primaryvalence of overweight and obesity in a provincial population of Canadian Primary children. CMAJ. 2004;171:240–242.
27-Speiser PW, Rudolf MC, Anhalt H, et al. Childhood obesity. J Clin Endocrinol Metab 2005; 90:1871.
28- Whitlock EP, Williams SB, Gold R, Smith P, Shipman S. Screening and Interventions for Childhood Overweight: A Systematic Review for the US Primaryventive Services Task Force: Systematic Evidence Review. Agency for Healthcare Research and Quality, Rockville, MD, 2005.
29-Weaver L, Edward C, Golden B, Reilly J. Obesity. In McIntosh N, Helms P, Smyth R editors :Forfar & Arneil's Textbook of Pediatrics. 6th edition. Churchill Livingstone , Philadelphia 2003:574-576.
30-Willms D. Early childhood obesity: a call for early surveillance and primaryventive measures.CMAJ (Canadian Medical Association Journal) 2004;171(3) 31-Roberts, S.B. & McDonald, R. (2000. February). The evolution of a new research field: Metabolic programming by early nutrition. Journal of Nutrition, 128(2 suppl):400S.:243-244.
31- Kranz S, Siega-Riz AM, Herring AH. Changes in Diet Quality of American Primaryers Between 1977 and 1998.Am J Public Health 2004;94(9):1525-1530.
32-Lichtman SW, Pisarska K, Berman ER, et al. Discrepancy between self-reported and actual caloric intake and exercise in obese subjects. N Engl J Med 2002; 327:1893.
33- Troiano RP, Briefel RR, Carroll MD, Bialostosky K. Energy and fat intakes of children and adolescents in the United States: data from the national health and nutrition examination surveys. Am J Clin Nutr2000;72:1343S–1353S.
34-Garn SM, Cole PE. Do the obese remain obese and the lean remain lean?. Am J Public Health 2003; 70:351.
35-Carruth BR, Skinner JD. The role of dietary calcium and other nutrients in moderating body fat in Primary children. Int J Obes (Lond) 2001; 25(4):559 - 566.
36-Glewwe P, Jacoby H. G. & King E. (2000) Early Childhood Nutrition and Academic Achievement: A Longitudinal Analysis. IFPRI Food and Consumption and Nutrition Division, Paper No. 68. International Food Policy Research Institute, Washington, DC.
37- Jafar TH, Chaturvedi N, Pappas G. Primaryvalence of overweight and obesity and their association with hypertension and diabetes mellitus in an Indo-Asian population. CMAJ 2006; 175: 1071–7.
38- WHO Global database on child growth and malnutrition. National Center of Health Statistics/World Health Organization reference data [online database] (http://www.who.int/nutgrowthdb/reference/en/, accessed 9 July 2007).
39- Epstein LH, Valoski AM, Vara LS, McCurley J, Wisniewski L, et al. Effects of decreasing sedentary behavior and increasing activity on weight change in obese children . Health Psychol 2005; 14:109-115.
40- Montgomery SM, Ekbom A. Smoking during primarygnancy and diabetes mellitus in a British longitudinal birth cohort. BMJ. 2002;324:26-27.
41-Wideroe M, Vik T, Jacobsen G, Bakketeig LS. Does maternal smoking during primarygnancy cause childhood overweight? Paediatr Perinat Epidemiol 2003;17:171-1795.
42- Power C , Jefferis B. Fetal environment and subsequent obesity: International Journal of Epidemiology 2002;31:413-419 .
43-Salsberry PJ, Reagan PB. Dynamics of Early Childhood Overweight. Pediatrics 2005 ;116(6):1329-1338.
44-Garn, SM, LaVelle, M. Two-decade follow-up of fatness in early childhood. Am J Dis Child 2005; 139:181.
45- Hediger ML, Overpeck MD,Kuczmarski RJ,Ruan WJ. Association between infant breastfeeding and overweight in young children. JAMA 2004;285:2453–2460.
46- Li L, Parsons TJ, Power C. Breast feeding and obesity in childhood: cross- sectional study. BMJ 2003;327:327–328. 47-Gartner LM, Morton J, Lawrence RA, Naylor AJ, O` Hare D, et al. Breastfeeding and the use of human milk. Pediatrics 2005;115 :496 –506.
48- Journal of the American Medical Association editorial. (2001, May 16). Breastfeeding may help primaryvent childhood overweight. Journal of the American Medical Association, 285(19):2506-2507.
49- American Academy of Pediatrics. (2003, August). Policy statement: primaryvention of pediatric overweight and obesity. Pediatrics, 112(2):424-430.
50. Tremblay MS, Willms JD. Is the Canadian childhood obesity epidemic related to physical inactivity? International Journal Obesity, Pediatrics 2000; 75:807.

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-16, November 2022
ISSN: 2749-3644

51-Summerfield, L.M. Childhood obesity. (ERIC Digest). Washington, DC: Educational Resources Information Center, U.S. Department of Education. Available online January 5, 2005.
52- Goran MI, Sun M. Total energy expenditure and physical activity in primarypubertal children: recent advances based on the application of the doubly labeled water method. Am J Clin Nutr 2004; 68 :944S–949S.
53-Sargent JD, Blanch flower DG. Obesity and stature in adolescence and earnings in young adulthood. Analysis of a British birth cohort. Arch Pediatr Adolesc Med 2004; 148:681.
54- Cole TJ et al. Establishing a standard definition for child overweight and obesity worldwide: international survey. British medical journal, 2000, 320:1240–3.
55-Hanevold C, Waller J; Daniels S, et al. The effects of obesity, gender, and ethnic group on left ventricular hypertrophy and geometry in hypertensive children: a collaborative study of the International Pediatric Hypertension Association. Pediatrics 2004; 113:328.
56-Kaplan KM, Wadden TA. Childhood obesity and self-esteem. J Pediatr 2000; 109:367.
57-Thouez JP, Ekoe JM, Foggin PM, et al. Obesity, hypertension, hyperuricemia and diabetes mellitus among the Cree and Inuit of northern Quebec. ArcticMed Res. 2000;49:180–188.
58- National Center for Health Statistics Growth Curves for Children: Birth to 18 Years 1997 U.S. Department of Health, Education and Welfare Washington, DC. Publication(1997) no. 78–1650.
59-Hoppin AG. Obesity. In: Pediatric Gastrointestinal Disease: Path psychology, Diagnosis, Management, 4th ed, Walker WA, Goulet O, Kleinman RE, et al editors, BC Decker, Ontario, 2004. p. 311.
60-Bhargava SK, Sachdev HS, Fall CH, et al. Relation of serial changes in childhood body-mass index to impaired glucose tolerance in young adulthood. N Engl J Med 2004; 350: 865–75.
61-Yusuf S, Reddy S, Ounpuu S, et al. Global burden of cardiovascular diseases. Part II. Variations in cardiovascular
62-Donohoue PA. Obesity. In Behrman RE, Kliegman RM, Jenson HB,(eds.). Nelson Textbook of Pediatrics, 17 edition, Elsevier Saunders, Philadelphia 2004:173-177.
63-Blecker U, Mehta DI, Davis R, et al. Nutritional problems in patients who have chronic disease. Pediatr Rev. Jan 2000;21(1):29-32.
64-Barlow SE, Dietz WH. Obesity Evaluation and Treatment: Expert Committee Recommendations. Pediatrics 2001;102(3): 29.
65- The Food Guide Pyramid for Young Children 2 to 6 Years Old. US Dept of Agriculture, Center for Nutrition Policy and Promotion; 2001.Availableat:http://www.cnpp.usda.gov/KidsPyra. PyraBook.pdf Accessed August 5, 2000.
66-Daniels SR, Arnett DK, Eckel RH, et al. Overweight in children and adolescents: path physiology, consequences, primaryvention, and treatment. Circulation 2005; 111:1999.
67-Onyango A, Koski K. & = Tucker K.=20 L. Food diversity versus breastfeeding choice in = determining=20 anthropometric status in rural Kenya toddlers. Int. J. Epidemiol. (2005) 27: 484:96489.
68-Martin RM, Davey Smith G, Mangtani P, Tilling K, Frankel S, et al. Breastfeeding and cardiovascular mortality: the Boyd cohort and a systemic review with meta-analysis. Eur Heart J.2004;25:778-786.
69-Owen CG, Whincup PH, Gilg JA, Cook DG. Effect of breast feeding in infancy on blood primaryssure in later life: systematic review and meta-analysis. BMJ 2003; 327 :1189 –1195.
70-Gidding SS, Dennison BA, Birch LL, Daniel SR, Gilman MW, et al. Dietary Recommendations For Children and Adolescents: A Guide for Practitioners. Pediatrics 2006 ;117(2):544-559.
71-Li, Z, Maglione, M, Tu, W, et al. Meta-analysis: pharmacologic treatment of obesity. Ann Intern Med 2005; 142:532.
72-Kelishadi R, Ardalan G, Gheiratmand R, et al. Rationale, methods and first results of a surveillance program for primaryvention of chronic diseases from childhood: CASPIAN Study. In: East Mediterr Health: J. 2004, 80(1):17–22.
73- Rogol AD, Lawton EL. Body measurements in malnutritional children . In: Pediatric Outpatient Procedures, Lohr JA (Ed), JB Lippincott, Philadelphia 2001. p. 127(2):314–20.
74-Waterlow J. C. Summary of causes and mechanisms of linear growth retardation. Eur. J. Clin. Nutr. (2004) :48(suppl. 1):S210.
75- Dibley MJ, Goldsby JB, Staehling NW. Development of normalized curves for the international growth reference: historical and technical considerations. Am J Clin Nutr 2000; 46: 736-748.
76-Nancy F, Laura E. Obesity Body measurements in malnutritional children. In Kliegman RM, Jenson HB, Marcdante KJ, Behrman RE edirors: Nelson Essentials of pediatrics, 5th edition , Elsevier Saunders, Philadelphia, 2006;140-142.
77-Kuczmarski RJ. Ogden CL. Guo SS. 2000 CDC Growth Charts for the United States: Methods and Development. National Center for Health Statistics; Vital Health Statistics 2002;246:1-190.