Overweight and Obesity Among Children and Adolescents in Baladrouz City

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Abstract

Background: Obesity in children and adolescents is one of the most serious public health challenges of the 21st century because of the effects of future morbidity. Its prevalence has increased significantly in mostcountries,especially in low and middle-income countries, especiallyin urban areas.

Objective: To know the distribution of this epidemic among our childrenand draw a real picture of intermediate school students in Baladrouzregion.

Patients and Methods: A cross-section study, involved the students of the first and the second stages, the information and the measurements were taken from 1798 students(910males, 888females) their ages were between 11-14 years , over one month duration (December of 2017), during this period we visit a were 10 Intermediate schools for both genders (six of them in the center of the region and four in the surrounding villages those belong to the region), included the age, weight, height, counting the body mass index, waist circumference, Neck circumference, systolic blood pressure and diastolic blood pressure in addition to the questionnaire form and the information of the school card.

Results: The percentages of the overweight and the obesityamong males were as follows:26.9% ,17.4 % for intermediate, first and second stages respectively, while in females it was 47.9% ,33.3% respectively .The percentage of weight gain and central obesity of the waist circumference was27.0% ,24.1% for the first and second stages respectively. Either in femals, as follows:21.5%, 12.8% for the first and second stages respectively. There was an increasing in the percentages of systolic blood pressure among female for all stages of the study,which amounted to 60.3%,48.7% either in males was 70.4%,64.8%for the first and second stagesrespectively.The percentage of normal diastolic blood pressure was 54.5%49.0%for males, while infemales it was 72.5%,65.7% for the first and second stages respectively.

Conclusion: The study showed high rates of overweight and obesity among middle school students, and was higher in females than males.

Keywords: Overweight, Obesity, Children of the Intermediate schools,Baladrouz**.**

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Introduction

Obesity among children, adolescents and adults has emerged as one of the most serious public health concerns in the 21st century. The worldwide prevalence of childhood obesity has increased unusually over the past 3 decades. The growing prevalence of childhood obesity has also led to appearance of obesity-related comorbid disease entities at an early age. Childhood obesity can adversely affect nearly every organ system and often causes serious consequences, including hypertension, dyslipidemia, insulin resistance, dysglycemia, fatty liver disease and psychosocial complications. It is also a major contributor to increasing healthcare expenses. For all these reasons, it is important to prevent childhood obesity as well as to identify overweight and obese children at an early stage so they can begin treatment and attain and maintain a healthy weight[1]. Obesity is most often defined by the body mass index (BMI), a mathematical formula of weight-for-height index. BMI is measured by dividing the body weight in kilograms to height in meters squared (kg/m2) [2,3,4]. In the pediatric age group, gender-specific BMI-for-age percentile curves are used to define overweight and obesity. Children and adolescents with a BMI over the 85th but less than the 95th percentile for age and gender are considered overweight and those with a BMI greater than the 95th percentile are considered obese. Children and adolescents with a BMI greater than the 99th percentile are considered severelyobese [5,3,6].High blood pressure has develop highly prevalent in children and adolescents in recent years [7,8]. the notion of prehypertension has been brought to light for children and adolescents too. Elevated blood pressure at a young age is a predictor of hypertensive disease later in lifee[9,10] and it is related with cardiac and renal alterations as well as target organ damage [11,12].Considering the potential future impact of uncontrolled high blood pressure in this segment of the population, excessive attention should be paid to establishing suitable prevention and treatment programs.Neck circumference (NC) has also been used as a potential proxy for obesity and cardiovascular disease in adults .Very few investigators11 have attempted to use NC to screen for high BMI in children; therefore, the objectives of this study were to examine the correlation between NC and BMI in children, to examine the ability of NC to identify correctly children with high BMI, and to determine the best NC cut point for identifying children of various ages as overweight/obese[13].

Patients and Methods

The Study involved the students of the first and the second stages, within Baladrouz region-Diyala , the information and the measurements were taken from 1798 students (910males, 888females) their ages were between 11-14 years, in one month duration (December of 2017), during this period the visits were to 10 Intermediate schools for both genders (six of them in the center of the region and four in the surrounding villages those belong to the region), included the age, weight, height, counting the body mass index, waist circumference, Neck circumference , systolic blood pressure and diastolic blood pressure in addition to the questionnaire form and the information of the school card.

Anthropometric measurements

The anthropometric measurements of the students were measured by tape measure tool for the height (the students stood on the ground and the height from head to toe was measured) and waist circumference measurements (below the last rib level or at the umbilicus level), balance apparatus for the body weight (kg) measurement by putting it on the ground and thestudent stood straightly on it and the body mass index of the studentswas counted for both genders (males and females) by using the following equation: [14] Body mass index = weight (kg) /height (m2).

Blood pressure measurement

The mercury sphygmomanometer was used for the systolic and diastolic blood pressure (mmHg) measurement by fitting the left arm to a solid stent and rolling the cuff about the arm and inflated it to cover 70% of the arm, adjacent the elbow.

Statistical analysis

The results were statistically analyzed by (Independent - Samples T Test) analysis and application of SPSS program version 20. A P value < 0.05 was considered statistically significant.

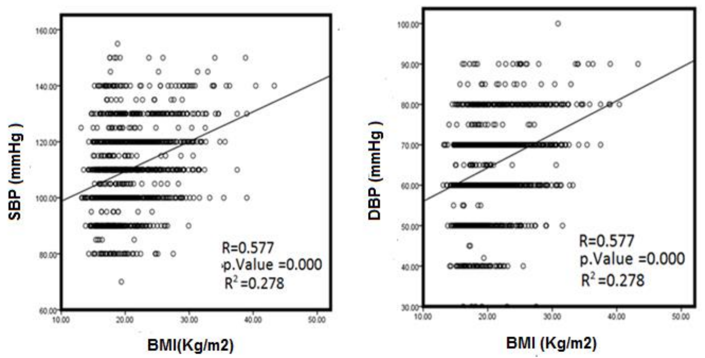
Results

The present study measures the body mass index, waist circumference, classified according to Centers for Disease Control (CDC) and Prevention to underweight, natural, overweight and obesity and systolic and diastolic blood pressure classified according to The Fourth Report on the Diagnosis.The Table (1) shows mean anthropometric measurement values and systolic and diastolic blood pressure and The mean BMI, WC, NC in both males and females, The rise BMI,SBP, DBP in females was higher than that of males at significant level (P value < 0.05).

Table (1): Comparison of anthropometric measurements, systolic and diastolic blood pressure between male and female.

Measures	Stages \ Age (years)		Male		Female
		Number	Mean ± SD	Number	Mean ± SD
BMI (kg/m2)	First(11-12)	433	20.03±4.33	459	21.08±4.37
	Second(13-14)	477	20.85±4.89	429	21.86±4.04
WC (cm)	First(11-12)	433	71.27±11.92	459	70.47±4.99
	Second(13-14)	477	73.79±13.14	429	71.87±10.04
NC(cm)	First(11-12)	433	30.92±5.37	459	30.22±2.21
	Second(13-14)	477	31.54±3.66	429	730.57±2.17
SBP (mmHg)	First(11-12)	433	107.30±13.92	459	112.91±15.44
	Second(13-14)	477	109.24±14.84	429	117.69±14.74
DBP(mmHg)	First(11-12)	433	63.49±11.64	459	68.61±10.96
	Second(13-14)	477	64.34±11.27	429	71.11±11.00

*SD: Standard deviation. BMI: Body mass index, WC: Waist circumference, NC: Neck circumference, SBP: Systolic blood pressure, DBP: Diastolic blood pressure .



Figure(1): BMI for SBP & DBP in males.

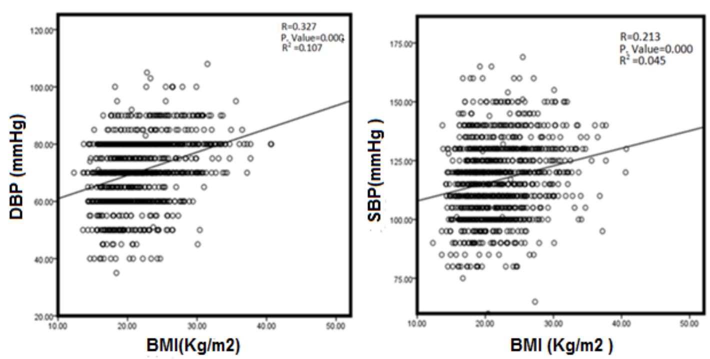


Figure (2): BMI for SBP & DBP in females

The Table (2) refers to the distributionof the overweight and obesity according to the body mass index for the males of the first and the second stages which reached (12.4 % ,14.5%) , (4.1 % , 13.2 %) respectively while the percentages of the overweight and obesity for the females of the first and the second stages reached (35.9% ,12.0 %) , (22.1 % ,11.1 %) respectively.

Table (2): The percentages of overweight and obesity distribution among the intermediate schools' students according to the body mass index measurement.

			U.w		Natural		O.w		Ob	
Gender	Stages/Age(years)	No.	Mean	%	Mean	%	Mean	%	Mean	%
Male	First (11-12)	433	14.60	7.22	18.00	65.81	23.33	12.43	28.56	14.54
	Second (13-14)	477	15.00	10.27	18.71	72.32	24.02	4.19	30.53	13.21
Female	First (11-12)	459	14.44	5.01	17.94	47.05	23.21	35.91	29.82	12.03
	Second (13-14)	429	14.83	1.87	19.44	64.81	25.07	22.14	30.68	11.18

*(%): Percentage, (No.): Number, (U.w.): Underweight, (O.w.): Overweight, (Ob.): Obesity

The Table (3) refers to the distributionof the overweight and the central obesity according to the waist circumference for the males of the first and second stages which reached (14.7 % , 9.4%) , (19.4 % ,7.5 %) respectively while the percentages of the overweight and the central obesity for the females of the first and second stages reached (13.5 % ,8.0%) , (10.7 % ,2.1 %) respectively.

Table (3): The percentages of overweight and obesity distribution among the intermediate schools' students according to the waist circumference measurement.

			U.w		Natural		O.w		Ob	
Gender	Stages/Age(years)	No.	Mean	%	Mean	%	Mean	%	Mean	%
Male	First (11-12)	433	58.41	37.72	65.96	38.10	80.11	14.78	93.77	9.40
	Second (13-14)	477	58.27	30.42	68.01	42.55	83.08	19.49	98.09	7.54
Female	First (11-12)	459	59.13	35.72	63.66	42.70	74.81	13.51	89.42	8.06
	Second (13-14)	429	58.62	36.15	66.89	51.04	78.77	10.72	89.83	2.09

* (%): Percentage, (No.): Number, (U.w.): Underweight, (O.w.): Overweight, (Ob.): Obesity

The Table (4) refers to the distributionof the prehypertension and hypertension according to the systolic blood pressure for the males of the first and second stages which reached (18.4 % , 11.0%) , (21.1 % , 13.3%) respectively while the percentages of the prehypertension and hypertension for the females of the first and second stages reached (20.0 % , 19.6%) , (23.3 % , 27.9 %) respectively.

Table (4): The percentages of prehypertension and hypertension distribution among the intermediate schools' students according to the systolic blood pressure measurement.

			Natural		Prehypertension		Hypertension	
Gender	Stages/Age(years)	No.	Mean	%	Mean	%	Mean	%
Male	First (11-12)	433	99.93	70.43	119.5	18.49	132.5	11.08
	Second (13-14)	477	101.3	64.88	120.8	21.74	127.5	13.38
Female	First (11-12)	459	102.8	60.34	121.2	20.12	135.1	19.62
	Second (13-14)	429	104.6	48.71	122.1	23.32	135.98	27.97

* (%): Percentage, (No.): Number

The Table (5) refers to the distribution of the prehypertension and hypertension according to the diastolic blood pressure for the males of the first and second stages which reached (39.1% , 6.3 %) , (33.9 % , 16.9%) respectively while the percentages of the prehypertension and hypertension for the females of the first and second stages reached (24.4 % ,3.0 %) , (26.8 % , 7.4%) respectively.

Table (5): The percentages of prehypertension and hypertension distribution among the intermediate schools' students according to the diastolic blood pressure measurement.

			Natural		Prehypertension		Hypertension	
Gender	Stages/Age(years)	No.	Mean	%	Mean	%	Mean	%
Male	First (11-12)	433	54.67	54.51	72.95	39.15	90.05	6.34
	Second (13-14)	477	55.83	49.06	71.81	33.97	83.15	16.98
Female	First (11-12)	459	72.54	72.54	80.47	24.41	91.23	3.11
	Second (13-14)	429	65.73	65.73	81.12	26.85	91.85	7.43

* (%): Percentage, (No.): Number

Discussion

The obesity is the main determine to increase the blood pressure in the childhood, the high prevalence of the fat in the body is an pointer for the some complications those belong to the obesity such as hypertension. According to the body mass index, the percentage of the overweight and obesity for the males was higher in the first stage 26.9% followed by the second stage17.4% while the percentage of the overweight and obesity for females was higher in the first stage47.9% followed by the second stage33.3%. The study of James et al 15 found that BMI is more associated with blood pressure than weight and height variables, as well as a good representative of some factors that are believed to have an effect on blood pressure, including diet. Several studies confirm a link between obesity and hypertension. The Flynm et al 16 study found that there is a threefold increased risk in obese children to develop hypertension than healthy children. According to the waist circumference, the percentage of the overweight and central obesity for the males was higher in the first stage27.0% followed by the second stage24.1 %,in females the percentage of the overweight and central obesity was higher in the first stage21.5% followed by the second stage 12.8%. Chen et al 17 showed a significant upward trend to increase blood pressure with increased waist circumference and BMI.

According to the systolic blood pressure, the percentage of the prehypertension and hypertension for the males was higher in the second stage 35.1 % followed by the first stage 29.5 % ,the percentage of the prehypertension and hypertension for the females was higher in the second stage 51.2 % followed by the first stage 39.6 %. According to the diastolic blood pressure, the percentage of the prehypertension and hypertension for the males was higher in the second stage 50.9 % followed by the first stage 45.4% while the percentage of the prehypertension and hypertension for the females was higher in the second stage 34.2 % followed by the first stage 27.4 % . study Hosseini et al 18,in 2015 showed that both the SBP and DBP rose steadily with increasing, for BMI. A positive relationship study also found increased waist circumference and increased systolic and diastolic blood pressure levels[19] . The results of the Kelishadi et al 20 study showed that neck circumference was significantly associated with some cardiovascular risk factors, including hypertension, weight gain, general and central obesity.

Conclusions

The study showed high rates of overweight and obesity among middle school students, and was higher in females than males.

Recommendations

Health awareness of the dangers of weight gain and obesity by holding lectures or seminars for students and their parents.

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