Prevalence of Overweight and Obesity Among Primary School Children in Basrah City Center

Firas A. Jassim[1]*, Ziyad T. Maki[2], Sajjad S. Issa[3]
[1] Department of community health Nursing, College of Nursing, University of Basra, Basra, Iraq
[2] Department of community and family medicine, Al-Zahra medical college University of Basra, Basra, Iraq
[3] Department of community health Nursing, College of Nursing, University of Basra, Basra, Iraq
Email: jassim@uobasrah.edu.iq
Email: ziyadshwaish@gmail.com
Email: sajjadalattar@yahoo.com

Abstract

Background: Various health crises are emerging day by day among the people but a major public health issue has been becoming obesity or overweight among under 12 years old children since the last few years. Aim:To estimate the prevalence of overweight and obesity among primary school children in Basra city, aged from 6 to 12 years, To identify any variation as per age and gender. Method :A cross sectional study was designed to estimate the prevalence of obesity in primary school children in Basra city, at 2015.the total number of the selected school was 34 and the total number selected of students was 1020 , from them 496 were females and 524 males , using a designed forma , each children was checked for age , sex, height , weight ,class , and whether passing or failed in their classes . Then the body mass index is calculated by special equation, used by the WHO, and in turn it was categorizes into three categories: first the underweight, second the normal weight and third the overweight and obese. The working team was asked to measure the height and weight for each selected student, using a weight and height scale. The Statistical Package for Social Science (SPSS), Version16 was utilized for the purpose of statistical analysis of the data. Results: The result of our study showed 11.2 % of the student was under weight, 53.6 % was normal, and 35.2 % was overweight and obese. The overweight and obese represent 15.32 % of the first class, 34.81 % of the third class and 49.86 % of the sixth class. 38.7 % of males and 31.87 % of females are overweight and obese i.e. males are more obese than females. 13.37 % of the obese children had negative final result and only 6.76 % of the normal had negative final result. Conclusions:From our study we concluded that the prevalence of overweight and obesity in primary school children in Basra city was 35.2 %, general males are more obese than females, students in the sixth class are more obese in compare to other classes and obese children are more prone to fail than none obese. In compare to other study in Basra city done at 2005 we found that there is increase in the trend of obesity as the yearsadvance.

1. Introduction

In the past decade, overweight and obesity among children has become a major public health problem in developed and developing countries (1)
Adverseoutcomes of overweight and obesity include psychological and physicaleffects during childhood and also increased risk of adult obesity, whichis a major independent risk factor for cardiovascular diseases, diabetes, hypertension and cancers (2). The increasing rates are a result of changing lifestyles and industrialization with the associated increasing rate of television viewing and playing with computer games, consumption of high calorie and high fat foods coupled withlow levels of energy expenditure in the form of low physical activity (3). In the United States of America (USA), the average rates for overweight and obesity among children have been reportedto be 22% and 11% respectively, while in the state of Carolina, it was 32.4%and 16.4% respectively (2). Figures for overweight and obesity for Spain and Italy were 40%, and for Canada 25.3% (4)

The mechanism of obesity development is not fully understood, and it is confirmed that obesity occurs when energy intake exceeds energy expenditure. There are multiple etiologies for this imbalance, hence, the rising prevalence of obesity cannot be addressed by a single etiology. Genetic factors influence the susceptibility of a given child to an obesity-conducive environment. However, environmental factors, lifestyle preferences, and cultural environment seem to play major roles in the rising prevalence of obesity worldwide. (5)
Overweight and obesity in childhood have significant impact on both physical and psychological health; for example, overweight and obesity are associated with hyperlipidemia, hypertension, abnormal glucose tolerance, and infertility. In addition, psychological disorders such as depression occur with an increased frequency in obese children. (6)
1.1.1 Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have

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a negative effect on health, leading to reduced life expectancy and/or increased health problems (7)

People are considered obese when their body mass index (BMI), a measurement obtained by dividing a person's weight in kilograms (Kg) by the square of the person's height in meters (m), exceeds 30 kg/m2, with the range 25-30 kg/m2 defined as overweight. (8)

Obesity increases the likelihood of various diseases, particularly heart disease, type 2 diabetes, obstructive sleep apnea, certain types of cancer, and osteoarthritis. (7) Obesity is most commonly caused by a combination of excessive food energy intake, lack of physical activity, and genetic susceptibility, although a few cases are caused primarily by genes, endocrine disorders, medications, or psychiatric illness. Evidence to support the view that some obese people eat little yet gain weight due to a slow metabolism is limited. (9)

Childhood obesity is a condition where excess body fat negatively affects a child's health or well-being. As methods to determine body fat directly are difficult, the diagnosis of obesity is often based on BMI. Due to the rising prevalence of obesity in children and its many adverse health effects it is being recognized as a serious public health concern. (10)

Classification

Body mass index (BMI) is acceptable for determining obesity for children two years of age and older. (11) It is determined by the ratio of weight to height.(12)

The normal ranges for BMI in children vary with age and sex. While a BMI above the 85th percentile is defined as overweight, a BMI greater than or equal to the 95th percentile is defined as obesity by Centers for Disease Control and Prevention. It has published tables for determining this in children. (13)

Statistics

With more than 42 million overweight children around the world, childhood obesity is increasing worldwide. (12) Since 1980, the number of obese children has doubled in all three North American countries, Mexico, the United States, and Canada. (14) Although the rate of childhood obesity in the United States has stopped increasing, the current rate remains high. In 2010, 32.6 percent of 6- to 11-year-olds were overweight, and 18 percent of 6- to 9-year-olds were obese. (14)

Causes

1-Genetics

Childhood obesity is often the result of an interplay between many genetic and environmental factors. Polymorphisms in various genes controlling appetite and metabolism predispose individuals to obesity when sufficient calories are present. Over 200 genes affect weight by determining activity level, food preferences, and metabolism. (15)Having two copies of the allele called FTO increases the likelihood of both obesity and diabetes.(16)

2-Family and social Practices

In the recent decades, family practices have significantly changed, and several of these practices greatly contribute to childhood obesity. (12)

3- Advertising

Advertising of unhealthy foods correlates with childhood obesity rates. (17) In some nations, advertising of candy, cereal, and fast-food restaurants is illegal or limited on children's television channels. (17)

4-Socioeconomic Status

It is much more common for those who have a lower socioeconomic status, to be overweight and to engage in less healthy behaviors and sedentary activities. (18)

Health Effects of Childhood Obesity

1-Immediate health effects

Obese youth are more likely to have risk factors for cardiovascular disease, such as high cholesterol or high blood pressure. In a population-based sample of 5- to 17-year-olds, 70% of obese youth had at least one risk factor for cardiovascular disease. (19) Obese adolescents are more likely to have prediabetes, a condition in which blood glucose levels indicate a high risk for development of diabetes. (20)

Children and adolescents who are obese are at greater risk for bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem. (21)

2-Long-term health effects

Children and adolescents who are obese are likely to be obese as adults and are therefore more at risk for adult health problems such as heart disease, type 2 diabetes, stroke, several types of cancer, and osteoarthritis. (22)

Overweight and obesity are associated with increased risk for many types of cancer, including cancer of the breast, colon, endometrium, esophagus, kidney, pancreas, gall bladder, thyroid, ovary, cervix, and prostate, as well as multiple myeloma and Hodgkin's lymphoma. (23)

Importance of the study

obesity among children has become a major public health problem in developed and developing countries, including Iraq . With wide range of adverse outcomes of include psychological and physical effects and also increased risk of adult obesity, which is a major risk factor for cardiovascular diseases, diabetes, hypertension and cancers

problem of the study

With more than 42 million overweight children around the world, childhood obesity is increasing worldwide.

The objectives of the study

1-To estimate the prevalence of overweight and obesity among primary school children in Basra city, aged from 6 to 12 years, defined by body mass index (BMI).

2-To identify any variation as per age and gender.
3- To identify any correlation between obesity and the educational level of the student, whether pass or fail in the previous stage

2. Methodology

Study setting

34 primary school children in Basra city was involved in the study. The agreement of the Basra education authority has been taken (appendix 1).

Design and Duration of the study:

A descriptive cross- sectional study was designed involving primary school children in Basra city. The period of study was 6 months, from the first of October 2014 to the first of April 2015.

The study sample and data collection

A randomly selected school was drowning from a list of schools taken from the Basra education office; from the selected schools we were chosen three stages. A random sample of student was taken from each stage.
The total number of the selected school was 34 and the total number selected of students was 1020, from them496 were females and 524 males

The studied variables

Age: the primary school age, extending from 6- 12 years
Gender: males and females
Weight: in kilogram
Height: in meter
Body mass index (BMI): according to WHO chart (appendix 2)
Where the BMI had categorized into 3 categories (1, 2,3)
Category 1 represents the underweight children
Categories 2 represent the normal weight children
Category 3 represents the overweight and obese children
The annual final result of students, which is either passed or failed
The Class: we were chosen three class of the primary school, which were first, third and sixth.

The tools

The team used designed forma for the purpose of the study thatwas displayed to teachers in the college of nursing as expert to take their opinions and advices, which include information related to the variables as shown in (appendix3).
The working team was asked to measure the height and weight for each selected student, using a weight and height scale. Then the body mass index is taken from the WHO chart by matching the weight and height with each age.

Statistical analysis

The Statistical Package for Social Science (SPSS), Version16 was utilized for the purpose of statistical analysis of the data.
The statistical measures was in form of means, standard deviation, frequencies, percentages, and Pearson correlation.

3. Results

Distribution of the studied population (students) in relation to variables

The table showed a total of 1020 primary school students was included in the study, their age was between 6- to 15-year-old, their length was 1.06 to 1.74 meter, their weight was 14 to 106 Kg, and their BMI was 8.79 to 40.39

Table 4.1.1 Distribution of the studied population (students) in relation to variables

Variables	Students number	Minimum	Maximum	Mean	Std. Deviation
Age	1020	6	15	8.45	2.150
Length	1020	1.06	1.74	1.3326	.14262
Weight	1020	14.00	106.00	34.5991	14.41213
BMI	1020	8.79	40.39	18.6842	4.50683

Frequency distribution of the studied students according to age

the table showed the frequency distribution of the sample according to age, 31.7 % of the students aged 6 years , while 30.4 % was 8 years and 28.7 % was 11 years , that is mean a 91% of the studied student is within the ages 6, 8 and 11 years , while only 9 % had other different ages where they represent the failed students .

Table 4.1.2. Frequency distribution of the studied students according to age

Age in years		Frequency	Percent
	6	323	31.7
	7	16	1.6
	8	310	30.4
	9	27	2.6
	10	4	.4
	11	293	28.7
	12	35	3.4
	13	7	.7
	14	4	.4
	15	1	.1
	Total	1020	100.0

Frequency distribution of students according to gender and BMI categories

The table showed that 48.6% of the studied students were males and 51.4% were females. The table also showed that 9.47 % of males and 12.78 % of females areunderweight, while 51.81 % of males and 55.34 % of females are normal weight, and 38.7 % of males and 31.87 % of females are overweight and obese.

Table4.1.3. Frequency distribution of students according to gender and BMI categories

BMI category								
Total		Overweight		Normal weight		Under weight		Gender
48.6%	496	38.7%	192	51.81 %	257	9.47 %	47	Males
51.4%	524	31.87 %	167	55.34%	290	12.78 %	67	Females
100 %	102 0		359		547		114	Total

Distribution of students according to BMI categories and student's class

The table showed that 11.2 % of the student was under weight, 53.6 % was normal, and 35.2 % was overweight and obese. the table also showed regarding underweight, it represent 62.28 % of the first class , 32.45 % of the third class and 5.26 % 0f the sixth class . For the normal weight, it represent 39.12 % of the first class, 32.54 % of the third class, and 28.33 % of the sixth class. For the overweight and obese, it represent 15.32 % of the first class, 34.81 % of the third class and 49.86 % of the sixth class. So it was clear that underweight was more in first class while obesity was more in sixth class.

Table4.1.4. Distribution of students according to BMI categories and student's class

Total		Sixth class		Third class		First class		BMI categories
11.2 %	114	5.26 %	6	32.45 %	37	62.28 %	71	Underweight
53.6 %	547	28.33 %	155	32.54 %	178	39.12 %	214	Normal weight
35.2 %	359	49.86 %	179	34.81 %	125	15.32 %	55	Overweight and Obese
100%	1020		340		340		340	Total

The association between age of students and BMI

The table showed asignificant association between age of the students and the BMI, that is mean as the student became older their weight will be more.

Table 4.1.5. The association between age of students and BMI

Correlations				
		Age	BMI	Result
Age	Pearson Correlation	1	.556**	
	Sig. (2-tailed)		.000	*Significant*
	N	1020	1020	
**. Correlation is significant at the 0.01 level (2-tailed).				

The relation of the BMI category with the final result of the students whether passed the class or failed in the class

The table showed a significant association between the final result of the students and their weight.

Table 4.1.6. The relation of the BMI category with the final result of the students whether passed the class or failed in the class

Correlations				
		category	Final Result	Result
Category	Pearson Correlation	1	.138**	*Significant*
	Sig. (2-tailed)		.000	
	N	1020	1020	
**. Correlation is significant at the 0.01 level (2-tailed).				

4. Discussion

Our study showed that 11.2 % of the primary school student was under weight, 53.6 % was normal, and 35.2 % was overweight and obese, that is mean 35.2 of our sample was overweight and obese, while Samira study which was done in Basra city at 2005 on the primary school showed that 19.6 % of their sample was overweight and obese (27), i.e. there is increasing obesity in the primary schools.

A studyon primary school childrenaged 7 to 12 years living in urban areas of Babol, northern Islamic Republic of Iran in 2006. To assess theprevalence of overweight/obesity. Showed that the prevalence of obesity and overweight was 5.8% and 12.3% respectively i.e. (18.1 %) and the prevalence was significantly lower in girls compared with boys(24). So that the prevalence of obesity is less in compare to our study, while it is similar to our study in that the prevalence of obesity is more boys in compare to girls.

An Indian study in Union Territory of Puducherry showed that the prevalence of overweight and obesity was 6.53%(25), while in Mahe region in India had the highest prevalence of overweight and obesity was 13.35 %, where the both results are less

than our study, while in Indian study the female children from private schools and urban areas were more overweight and obese in compare to boys (25)where the reverse is in our study.

A study on Prevalence of overweight and obesity in primary school children in Port Said city, showed that Prevalence of overweight and obesity was 31.2 % which is near to our study (26).Port Said studyshowed that overweight increased with an increase in age to be the highest at the age of 10–11 years (26)which is also similar to our study where in our study, it is about 50 % (table 4.1.4).

5. Conclusions

1- The prevalence of overweight and obesity in primary school children in Basra city was 35.2 %.
2- General males are more obese than females.
3- Students in the sixth class are more obese in compared to other classes.
4- Obese children are more prone to fail than nonobese.
5- In compare to other study in Basra city done at 2005 we found that there is increase in the trend of obesity as the years advance.

6. Recommendations

1-Reversing the rapid increase in obesity primary schools children will require a multi-pronged approach by schools, families, communities, industry, and government that would be as comprehensive as national antismoking efforts.
2-increase and improve opportunities for children to engage in physical activity and eat a healthy diet.
3- Schools should implement nutritional standards for all foods and beverages served on school grounds.
4- Schools should expand opportunities for all students to engage in at least 30 minutes of moderate to vigorous physical activity each day. Schools should provide physical education classes that last 30 to 60 minutes each day.
5- School health services should measure each student's weight, height, and body mass index (BMI) annually and provide the results to the students and families.
6-Parents must play their part as well, by providing healthy foods in the home and encouraging physical activity by limiting their children's television time, video game, and computer time to less than two hours a day.
7- Educational programs about obesity and associated health consequences should start early in childhood so as prevent the increasing prevalence of childhood obesity.

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