A study about Obesity among Preschool Children at Al-Zubair District

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Abstract

Obesity is defined as an excess body fat in an individual. It is considered a chronic, non-communicable disease. The fundamental cause of obesity is a greater imbalance between energy intake and expenditure than is expected for normal growth and development. This study aims to estimate the level of obesity in preschool children and to find out association between body mass index (BMI) and different variables. This study is a descriptive cross-sectional study was carried out involving preschool children in Alzubiar district, from October 2018, till April 2019. A total of 403 children shared in the study and they were chosen randomly from five kindergartens. The study included the following variables: age, gender, weight, height, BMI. The height and weight for each participant were measured by the working team and recorded on a special forma. This study showed that; about two thirds of children (64.8%) were at 4 years age, approximately equal sex distribution, nearly half of all participants (48.2%) were at risky group (over weight and obese), the youngest participants (those age 4 years) were at risky group more than others, female children (52%) were slightly more risky than males (48%). There was a high significant association between kindergarten and BMI at 0.01 levels. In conclusion, approximately half of involved children were at risky group, inverse relationship between the weight and the age of the children, the females were slightly more risky than males, and there is a significant association between kindergarten and BMI at 0.01 level.

Introduction

Obesity can be defined as an excess body fat in an individual. It is considered a chronic, non-communicable disease.[1] Such diseases are currently the principal causes of death in both developed and developing countries, thus making them one of the largest public health problems. There is strong evidence that childhood obesity leads to adult obesity and its related comorbidities.[2]

Body Mass Index (BMI) is a calculation that estimates how much body fat a person has based on their weight and height. It changes with age, so, doctors plot BMI measurements on standard gender-specific growth charts. BMI is not a direct measure of body fat.[3]

The categories that describe a person's weight are :[3]

1.   Underweight: BMI is below 5th percentile for age, gender, and height.
2.   Healthy weight: BMI is equal to or greater than 5th percentile and less than the 85th percentile for age, gender, and height.
3.   Overweight: BMI is at or above the 85th percentile but less than the 95th percentile for age, gender, and height.
4.   Obese: BMI is at or above the 95th percentile for age, gender, and height.

In the United States, childhood obesity rates have tripled in the past decade, with more than one quarter of American children 2–5 years of age overweight.[4]

This obesity epidemic is fueled, in part, by excess childhood weight gain. Dramatic increases in childhood obesity foreshadows serious health consequences (e.g., early risk for much of adult morbidity and mortality and premature death,[5] type 2 diabetes,[6] hypertension and -lipidemia,[7] cardiovascular disease,[8] asthma and sleep apnea,[9] lower self-esteem,[10] and psychological and social stress.[11]

Overweight/obesity tracks from childhood into adulthood and is difficult to treat successfully in the long term. Therefore, the Institute of Medicine recommends that prevention is crucial to combat the childhood obesity epidemic.[12]

Although effective action to prevent the childhood obesity epidemic requires an evidence base of early-life risk factors, unfortunately, this evidence base is still very incomplete.[13] Despite the increasing prevalence of obesity in preschool children, researchers have focused on risk factors in school-age children and adolescents.[14] Existing prevention strategies, focused on late childhood and adolescence, are largely unsuccessful because eating behaviors are already established by school age.[15] Further, few studies have tried to capture the complete picture of childhood obesity risk factors. Most studies have included fewer predictors of overweight, such as parental obesity,[16]

breastfeeding duration, [17] childhood television use, [18] diet [17] and nighttime sleep duration. [19] However, these risk factors often do not occur in isolation.

It is well accepted that there is no single cause of childhood obesity, but coactions at multiple levels (e.g., genetic, cellular, physiological, psychological, social, and cultural) determine outcomes. [20] Children and 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.(24) 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.(25)

Objectives

1.   To estimate the level of obesity in preschoolers
2.   To compare between different schools
3.   To find out the association between different variables

Pathophysiology of obesity

The fundamental cause of obesity is a greater imbalance between energy intake and expenditure than is expected for normal growth and development. Usually, this occurs over a period of time and in the presence of a susceptible genetic background and environmental factors. Epigenetic factors, defined as the changes in gene function that do not relate to changes in DNA sequence, begin *in utero* also contribute. Infants of diabetic mothers and of mothers who smoke during pregnancy have increased risk of subsequent obesity. Infant feeding practices may also play a role, particularly a shortened period of breastfeeding. A reduced amount of sleep during infancy is another potential risk factor for obesity. Some medications have been clearly demonstrated to cause excess weight gain. [21]

Complications (22)

The complications can occur both in the short-term and in the long-term. Some complications, such as type 2 diabetes mellitus, previously thought to only occur in adulthood have now been shown to occur in children and adolescents. The obesity epidemic might shorten the life span of the current generation of children.

1.   Psychosocial: Poor self-esteem, anxiety, depression, eating disorders, social isolation.
2.   Endocrinal: Insulin resistance, type 2 diabetes, early puberty.
3.   Cardiovascular: High blood pressure, high cholesterol, advanced vascular ages, early onset atherosclerosis.
4.   Pulmonary: Sleep apneas, asthma, exercise intolerance.
5.   Gastrointestinal: Fatty liver, gallstones, constipation, cirrhosis.

6.   Musculoskeletal: Blount's disease, back pain.

Methodology

Study setting and population

A descriptive cross- sectional study was designed involving preschool children in Al-Zubair district. The agreement of the Basra Education Directorate was approved. It is carried out over 6 month's duration, from October 2018 to April 2019.

The study sample and data collection

Five kindergartens were randomly selected from a list provided by Basra Education Directorate and number of children was chosen from each kindergarten, the total number of participants was 403 representing the study sample.

The study includes the following variables: age (from 4 to 6 years), gender (males and females), weight (measured in kilogram), height (measured in meter), and Body Mass Index (BMI). According to WHO chart, BMI had categorized into 3 categories:

1.   Category 1 represent the underweight children
2.   Category 2 represent the normal weight children
3.   Category 3 represent the overweight and obese children

The tools: the working team measured the height and weight for each selected child, using a weight and height scale, recording the results on a special forma which was displayed to experts in the college of nursing to take their opinions and advices.

Statistical analysis: the Statistical Package for Social Science (SPSS), Version-16 was utilized for the purpose of statistical analysis of the data, which were recorded as frequencies and percentages.

Results

Table (1): distribution of the sample according to age		
Age (year)	Frequency	Percent
4	261	64.8%
5	107	26.6%
6	35	8.7%
Total	403	100%

The table showed that: 261 children (64.8 %) were at 4 years age, 107 (26.6%) at age of 5 years, and 35 (8.7 %) at the age of 6 years.

Table (2): distribution of the sample according to gender		
Gender	Frequency	Percent
Male	194	48.1%
Female	209	51.9%
Total	403	100%

The table showed that: 209 (51.9 %) of children were females and 194 (48.1%) were males

Table (3): distribution of the sample according to kindergarten		
Kindergarten	Frequency	Percent
AL-Krawan	210	52.1%
AL-Zohor	70	17.4%
AL-Hanon	20	5.0%
AL-Salam	34	8.4%
AL-Anwar	69	17.1%
Total	403	100%

The table showed: 210 (52.1%) children were from AL-Karawan kindergarten, 70 (17.4%) from AL-Zohor kindergarten, 20 (5%) from AL-Hanon kindergarten, 34 (8.4%) from AL-Salam kindergarten, and 69 (17.1%) from AL-Anwar kindergarten.

Table (4): distribution of the sample according to BMI classes		
BMI Class	Frequency	Percent
Under weight	34	8.4%
Health weight	175	43.4%
Over weight	89	22.1%
Obese	105	26.1%
Total	403	100%

The table showed that: 34 (8.4%) children were under weight, 175 (43.4%) were healthy weight, 89 (22.1%) were overweight and 105 (26.1%) were obese, (48.2% were the risky group).

Table (5): distribution of the kindergartens according to BMI classes					
Kindergarten	BMI Class				
	Under weight	Healthy weight	Over weight	Obese	Total
AL-Karawan	7	74	53	76	210
AL-Zohor	3	35	15	17	70
AL-Hanon	0	5	8	7	20
AL-Salam	11	21	1	1	34
AL-Anwar	13	40	12	4	69
Total	34	175	89	105	403

This table showed the distribution of the classes of BMI according to the kindergartens, the risky group of children (over weight and obese) were distributed according to the kindergartens as follows: 129 (61.4%) of AL-Karawan kindergarten children, 32 (45.7%) at AL-Zohor kindergarten, 15 (75%) of AL-Hanon kindergarten, 2 (5.8%) at AL-Salam kindergarten, and 16 (23%) of the children at AL-Anwar kindergarten.

Table (6): distribution of the age according to BMI classes					
Age (years)	BMI class				
	Under weight	Health weight	Over weight	Obese	Total
4	27	101	58	75	261
5	5	52	24	26	107
6	2	22	7	4	35
Total	34	175	89	105	403

This table showed the distribution of the classes of BMI according to the age. Accordingly; the risky group of children (over weight and obese) were distributed as follows: 133 (51%) of those age 4 years, 54 (46.7%) of the 5 years old children and 11(31%) of the 6 years old children.

Table (7): distribution of the BMI classes according to gender					
Gender	BMI Class				
	Under weight	Health weight	Over weight	Obese	Total
Female	15	78	41	60	194
Male	19	97	48	45	209
Total	34	175	89	105	403

This table showed the distribution of the classes of BMI according to the gender. Accordingly; the risky group of children (over weight and obese) were distributed as follows: 101(52 %) of the female children while 93(48 %) of the male children were overweight and obese.

Table (8): the correlation the kindergartens and the BMI classes				
Correlations				
			kindergarten	Class
kindergarten	Pearson Correlation		1	-.380**
	Sig. (2-tailed)			.000
	N		403	403
Class	Pearson Correlation		-.380**	1
	Sig. (2-tailed)		.000	
	N		403	403

**. Correlation is significant at the 0.01 level (2-tailed).

This table showed that there was a high significant association between kindergarten and BMI classes at 0.01 levels.

Discussion

Obesity is a chronic, non-communicable disease, and can be defined as an excess body fat in an individual. [1] It represents a great public health problem as it is a major cause of morbidity and mortality. Serdula MK et al [2] showed that; there is strong evidence that childhood obesity leads to adult obesity and its related comorbidities. Body fat of a subject can be estimated by calculating BMI which depends on the weight and height. It changes with age, so, standard gender-specific growth charts are used to assess the body weight status (underweight, healthy weight, overweight or obese), and BMI is not a direct measure of body fat. [3] Daniels SR et al (2009) [21] explained that; the greater imbalance between energy intake and expenditure than is expected for normal growth and development is the principal cause of obesity.

A total of 403 children were involved in the current study representing the study sample and were randomly selected from five kindergartens, 209 (51.9 %) of them were females and 194 (48.1%) were males as shown in table (2), while table (1) showed the age distribution of the sample: 261 children (64.8 %) were at 4 years age, 107 (26.6%) at age of 5 years, and 35 (8.7 %) at the age of 6 years. Approximately, half of the children 194 (48.2%) involved in this study are risky (overweight and obese) as shown in table (4) and this can be explained by decreased physical activity and bad dietary habits for those children. It is obvious that there is a great variation in the distribution of the BMI categories according to the kindergartens, table (5) showed that; (61.4%) of AL-Karawan kindergarten children were at risky group while only 2 (5.8%) at AL-Salam kindergarten were so, this could be due to the difference due to the differences in the physical activities available or types of food allowed in the different kindergartens. Distribution of the risky group children (overweight and obesity) is inversely proportional with their ages: 133 (51%), 54 (46.7%), and 11(31%) for 4, 5, and 6 years old are risky as in table (6) , this reflecting the increasing activity with increasing age, despite the low activity level of them in general. Table (7) showed that: 101(52 %) of the female children were at risky group (overweight and obese) versus 93(48 %) of the male children, also, this result is explained by the difference in physical activity between the different gender (male more active than females). Lifestyle issues like too little activity and too many calories from food and drinks are the main contributors to childhood obesity. Many factors working in combination increase your child's risk of becoming overweight including: diet; regularly eating high-calorie foods, such as fast foods, baked goods and vending machine snacks, is a cause for your child to gain weight, lack of exercise; children who don't exercise much are more likely to gain weight because they don't burn as many calories, too much time spent in sedentary activities, such as watching television or playing video games, also contributes

to the problem, socioeconomic factors also, limitation of a safe place to exercise between the kindergartens. [23]

Conclusions

1. Females are slightly more than male children, (51.9%) was females and (48.1%) was males.
2. Majority (64.8%) of the involved children were at 4 years age, while (26.6%) and (8.7%) were at the age of 5 and 6 years respectively.
3. Approximately half of involved children (48.2%) were at risky group (22.1% overweight and 26.1 obese), while (8.4%) were under weight, and (43.4%) were healthy weight.
4. Distribution of the risky group (overweight and obesity) is inversely proportional with age of the children: 133 (51%), 54 (46.7%), and 11(31%) for 4, 5, and 6 years old are risky.
5. Distribution of (overweight and obesity) is slightly more in females than male children, (52%) of the females versus (48 %) of the male children were risky.
6. There is a highly significant association between kindergarten and BMI classes at 0.01 level

Recommendations

1- Training and exercises must be a part of daily practices of the kindergarten
2- Initiate teaching program about healthy diet
3- Monitor the eating practice of the children in the kindergarten.

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