

PREVALENCE OF OBESITY IN PRESCHOOL CHILDREN AT HILLA/IRAQ

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ABSTRACT

Background: More and more preschool children in Iraq and elsewhere are becoming overweight or obese. Many countries are now reporting a similar trend among preschool children. However, little information is available on the prevalence of overweight and obesity among preschool children in Iraq. In addition, available data are based on reported rather than measured height, weight, and BMI. **Aims:** To determine the prevalence of obesity/overweight among preschool children in private and governmental kindergartens at Hilla 2020. **Methods and Material:** cross sectional study. Measuring heights, weights, and BMI of a sample of children aged 2–5 years living in Babel “Hilla” Iraq in both private and governmental kindergartens, using a cross sectional design with applied quantitative research. The study was conducted for a period extended from Jan 2020 till Dec 2020. The total participants were 2148 parents and their 2-5 years old children selected from all kindergartens available. The data collected by using an adapted questionnaire and were analyzed electronically. **Results:** The prevalence of overweight and obesity in preschool kindergarten children was 14.8% and 5.9% respectively, the main factors that affect childhood obesity are family income and the presence of obesity in other family members. **Conclusions:** There is a high prevalence of obesity/overweight among 2-5 years old children with a noticeable difference regarding obesity/overweight prevalence between governmental and private kindergartens.

KEYWORDS: Pediatric obesity, Child nutrition, obesity, overweight.

INTRODUCTION

Obesity has emerged as a global pandemic, affecting over a billion individuals worldwide.^[1] Over the past three decades, the number of overweight children, defined as having a body mass index (BMI) greater than the 85th percentile for their age and sex, has tripled.^[2] In the United States, more than 30% of children are classified as overweight or obese, with a BMI above the 95th percentile.^[3] Shockingly, data from the International Obesity Task Force reveals that approximately 22 million children under the age of five worldwide are already overweight or obese.^[4] In certain parts of Africa, obesity has surpassed malnutrition as the primary nutritional concern, with overweight and obesity rates up to four times higher than malnutrition rates.^[5] The epidemic of childhood obesity has become particularly severe in developed countries, such as the United States, where 25% of children are overweight and 11% are obese.^[6] Disturbingly, approximately 70% of obese adolescents are likely to carry their weight problem into adulthood.^[7] The prevalence of childhood obesity has been steadily increasing in developed nations since

1971.^[8] To assess the prevalence of obesity and overweight among preschool children in Babylon, Iraq, this study aims to utilize multiple indicators and investigate potential correlations between obesity/overweight and socioeconomic status as well as family history. The Center for Disease Control and Prevention defines overweight as being at or above the 95th percentile of BMI for age, while "at risk for overweight" is defined as falling between the 85th and 95th percentiles of BMI for age.^[9,10]

METHODS AND MATERIAL

Study Design: A cross-sectional study with analytic elements.

Study Setting: The study was conducted from January 2020 to December 2020, in Al-Hillah/Babylon/Iraq, at governmental and private kindergartens. A total of (16) governmental and (24) private kindergartens (KGs) were included, The estimated number of children attending these kindergartens is supposed to be almost 4000 students according to the annual lists of Babylon

Education Directorate at the early 2020. Due to the health restrictions related to COVID-19 infection the number of attendants has dramatically declined especially at the governmental sector. Data were collected from all the children available at the time of visit the study included (1064) child from the private and (1084) child from the governmental sector, including all 2-5 year/old children of both genders who attended those kindergartens who agreed (and their parents) to participate in the study child's demographic data including age, gender, history of family obesity and weight, and height. Body mass index (BMI) was calculated and linked to the WHO related growth charts.

Data Analysis of data was carried out using IBM Statistical Packages for Social Sciences (SPSS version 27). The significance of difference of different percentages (qualitative data) were tested using Pearson Chi-square test (χ^2 -test). Statistical significance was considered whenever the P value was equal or less than 0.05.

RESULTS

(62.2 %) of the study sample children were 5 years old, the remaining (38.8 %) were 2-4 years old, gender distribution is almost equal with slightly more males than females (1076 male vs. 1072 female) (Table 1).

Most of the study sample (77%) (1651 child) are with normal BMI for age according to the WHO growth charts, 2.4 % (52 child) of them were underweight, 14.7% were overweight (318 child) and that only 5.9 % were obese (127 child) (Table 2) and (figure1).

Regarding the relation between BMI and age, there was a significant statistical association between the children age group and their BMI with P value of (0.0001) in which obesity was less at the age of 4 (1.5 %), overweight is mostly found within 2-years old children (20.3%) . While gender did not show significant statistical association with BMI, males and females tend to show similar patterns of weight distribution (Table3).

A strong association between the presence of overweight/obesity in the family and the likelihood of a child to develop it (P value < 0.0001), children whose parents answered that they have another family member with obesity tend to be more overweight/obese compared to those who answered "No" (87.5% of their children lie within the normal range of BMI) (Table 4). The results obtained in the study showed that there is a highly significant positive association between family income and the likelihood to develop obesity and overweight among their children (Table 5).

Table 1: The distribution of the study samples according to age and gender (n= 2148).

		No	%
Age (years)	2	39	1.8
	3	113	5.3
	4	660	30.7
	5	1335	62.2
sex	Male	1076	50.1
	Female	1072	49.9

Table 2: The distribution of the study samples according to BMI (n= 2148).

		No	%
BMI categories	Underweight	52	2.4
	Normal	1651	77.0
	Overweight	318	14.7
	Obese	127	5.9

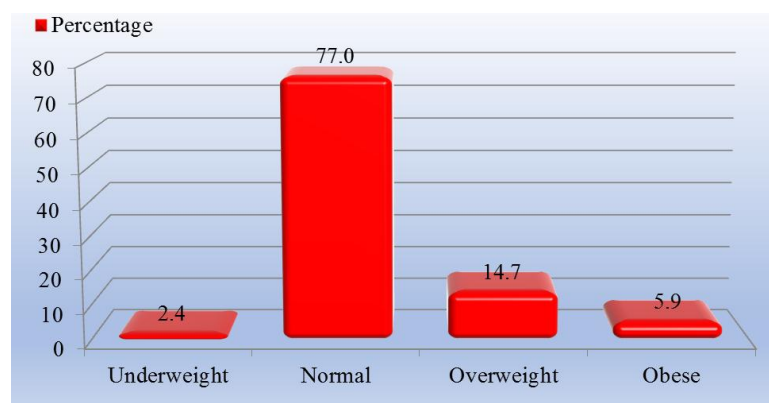


Figure 1: The BMI distribution of the study sample according to growth charts.

Table 3: The distribution of the study sample according to the association between the children age/sex and their BMI (N=2148).

		Underweight		Normal		Overweight		Obese		P value
		No	%	No	%	No	%	No	%	
Age (years)	2	-	-	28	71.8	8	20.5	3	7.7	0.0001*
	3	2	1.8	88	77.9	18	15.9	5	4.4	
	4	20	3.0	538	81.5	92	13.9	10	1.5	
	5	30	2.2	999	74.8	197	14.8	109	8.2	
sex	Male	23	2.1	827	76.9	164	15.2	62	5.8	0.731
	Female	29	2.7	827	77.1	151	14.1	65	6.1	

*Significant difference between percentages using Pearson Chi-square test (χ^2 -test) at 0.05 level.

Table 4: The association between BMI and the type of the kindergarten, number of family members, child's sequence in family, and family history of obesity (N=2148).

		Underweight		Normal		Overweight		Obese		P value
		No	%	No	%	No	%	No	%	
Type of KG	Governmental	32	3.0	838	77.3	155	14.3	59	5.4	0.309
	Private	20	1.9	816	76.7	160	15.0	68	6.4	
Family members	3	27	3.1	677	76.8	124	14.1	53	6.0	0.142
	4	15	1.7	688	76.9	139	15.5	53	5.9	
	5	8	2.3	270	76.9	52	14.8	21	6.0	
	6	2	9.5	19	90.5	-	-	-	-	
Child's sequence in family	1	32	2.7	910	76.2	180	15.1	73	6.1	0.666
	2	13	1.8	552	77.9	104	14.7	40	5.6	
	3	6	2.6	179	77.8	31	13.5	14	6.1	
	4	1	7.1	13	92.9	-	-	-	-	
Obesity in other family members	Yes	8	1.3	329	52.0	207	32.7	89	14.1	0.0001*
	No	44	2.9	1325	87.5	108	7.1	38	2.5	

*Significant difference between percentages using Pearson Chi-square test (χ^2 -test) at 0.05 level.

Table 5: The association between BMI and the socioeconomic variables (N=2148).

		Underweight		Normal		Overweight		Obese		P value
		No	%	No	%	No	%	No	%	
Father's education	Read & write	-	-	21	84.0	4	16.0	-	-	0.471
	Primary	4	3.3	93	76.9	16	13.2	8	6.6	
	Secondary	14	2.4	443	76.9	87	15.1	32	5.6	
	College	28	2.3	962	77.3	186	15.0	68	5.5	
	Higher education	6	3.3	135	74.2	22	12.1	19	10.4	
Father's work	Governmental employee	23	2.4	749	77.1	132	13.6	67	6.9	0.467
	Self-employee (private job)	16	2.2	560	77.9	109	15.2	34	4.7	
	Military officer	13	2.8	345	75.3	74	16.2	26	5.7	
Mother's education	Read & write	3	1.3	177	76.6	37	16.0	14	6.1	0.531
	Primary	9	2.7	266	78.5	48	14.2	16	4.7	
	Secondary	9	2.6	265	76.8	48	13.9	23	6.7	
	College	29	2.5	900	77.1	174	14.9	65	5.6	
	Higher education	2	3.1	46	70.8	8	12.3	9	13.8	
Mother's work	Governmental employee	17	2.5	532	76.9	100	14.5	43	6.2	0.978
	Housewife	35	2.4	1122	77.1	215	14.8	84	5.8	
Family funds	Insufficient	2	1.3	107	71.3	22	14.7	19	12.7	0.0001*
	Sufficient to some extent	23	2.0	876	75.1	191	16.4	76	6.5	
	Sufficient & more	27	3.2	671	80.6	102	12.3	32	3.8	

*Significant difference between percentages using Pearson Chi-square test (χ^2 -test) at 0.05 level.

DISCUSSION

Childhood obesity is a pressing global health concern that has been steadily increasing in recent years.^[11] The

rising prevalence of obesity among children has become an epidemic worldwide, leading to significant consequences such as psychiatric, psychological, and

psychosocial disorders during childhood, as well as an elevated risk of developing non-communicable diseases (NCDs) later in life. Recognizing the gravity of the situation, member states of the World Health Organization (WHO) have endorsed a target to halt the increase in childhood obesity by 2025.^[12] In a specific study sample, the prevalence of overweight was found to be 14.8%, while the prevalence of obesity was 5.9% (obese individuals were not included in the overweight category). Although these rates are high, they are still lower compared to Saudi Arabia and Iran, where approximately one in every six children were overweight.^[13,14] These findings align with the most recent estimates of overweight trends among children under the age of 5, which were jointly published by UNICEF, WHO, and the World Bank in April 2019.^[15] Moreover, the prevalence of overweight decreases significantly with age, although there is a slight increase in prevalence between the age groups of 4 years (13.9%) and 5 years (14.8%). Other studies have indicated that obesity rates increase with age, although the specific age groups studied may differ. For instance, one study found that the proportion of overweight and obese children increased from 5% and 0.9% at age 7 to 6.5% and 1.8%, respectively, at the age of 12. Additionally, overweight was nearly twice as prevalent in the oldest age quarter compared to the youngest age quarter.^[16] However, it is worth noting that obesity appears to exhibit a more rapid increase among children aged 5 to 19 years compared to younger children, who do not exhibit predictable patterns of increment with age.^[17] The prevalence of overweight was slightly higher in private sector (15.2%) than in governmental kindergartens (14.4%), also the prevalence of obesity is greater in private (6.4%) compared to governmental (5.4%) this finding is supporting that socioeconomic statuses influence the prevalence of obesity⁽¹⁸⁾, people who choose to send their children have to do that because of their financial situation as the researched have estimated during data collection most of these parents don't have sufficient income to pay for private kindergartens or that they don't wish to, but most of them are convinced that private kindergartens can provide better environment and education for their children than what's found at the governmental. Overweight was slightly greater in boys than girls, but for obesity girls were more than boys. sex did not appear to affect the distribution of overweight/obesity. There are clear regional differences in the relationship between obesity level and sex, in 2016, the prevalence of obesity was higher in girls than boys in most countries in sub-Saharan Africa and Oceania, as well as in some other middle-income countries. In contrast, obesity was more common in boys than girls in all high-income countries, and all countries in East and Southeast Asia. Substantial differences in the boy/girl ratio in the general populations of some countries can partly explain this finding. For example, in both China and India in 2016, there were 19 million more 5–19-year-old boys than girls.^[19] Most of the children included in the study were of 5 years of age (62.2%) followed by 4 years (30.7%),

children at 3 years and 2 years were only 5.3% and 1.8% respectively. This could be due to the fact that governmental kindergartens which resemble almost half of the study sample do not accept children less than 4 of their age in their facilities, and that the parents in Iraq think of kindergarten as a preparatory stage prior to starting school at the age of 6, so unless they have to keep their child in a kindergarten because they don't have time/person to look after their child while they are out for work they don't chose to send him/her into a preschool facility. The presence of obesity in family looks to be a great influencer for overweight and obesity to be found in children with high statistical association with the child's BMI, this finding is discussed many studies that states that obese parents tend show much higher risk to have obese children than normal weight parents.^[20] The overweight and obese children who had a family member with obesity, showed a statistically significant association, which explain the fact that obesity runs in families and that genetics highly influence the likelihood of developing overweight. Financial situation of the family is another influencer for overweight/obesity, most of the families that participated in this study have sufficient income (54.3%), only 7% were with more than enough to spend and 38.7% do have sufficient income. Most of the children (84%) who live with families that don't have sufficient income attend governmental kindergartens. The higher family income is highly associated with the development of overweight and obesity with great statistically significant.

CONCLUSIONS

1. One in five children (20%) is overweight/obese and this is more than what's recommended in guidelines for a healthy community by the WHO and AAP for this age group gender distribution of overweight/obesity was similar.
2. No significant difference in distribution of obesity/overweight between both private and governmental sectors.
3. There is a significant association between presence of obesity in the family and the likelihood of a preschooler to develop it.
4. The family income and financial situation is a great influence for the children BMI.

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