Comparison of Body Mass Index in Children of Two Different Regions of Welfare

Abbas Shapouri Moghadam[1], Mohammad Safarian[2], Rahim Vakili[3], and Seyed Morteza Ehteshamfar[1]

[1] Department of Immunology, Immunology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

[2] Department of Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran

[3] Department of Pediatrics Endocrinology and Metabolism, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract- Socioeconomic basis of children obesity is of high importance for preventive policies. This study aimed to compare the prevalence of obesity among children living in two different levels of welfare regions in Mashhad northeast of Iran. A total of 625 primary school girls and boys aged 78-127 months were randomly selected, and values of their body mass index (BMI) were measured. The prevalence of both overweight and obesity were higher among students of enriched area in comparison with that of resource restricted ($P<0.05$).The prevalence of overweight concerns in urban and rural areas. These results highlight the relation between socio-economic status and prevalence of obesity among children.

Introduction

Obesity and overweight is one of the most common health problems in children in both the developed and developing countries including Iran and is also a major contributing factor to adulthood obesity (1). Different factors may play roles in childhood obesity, and the socioeconomic background may be among the most efficient ones (2). Such data for the second great city of Iran (Mashhad) is missing and, therefore, this study was conducted to address this issue. Sajjadshahr in Mashhad is known as a region of wealthy people and inversely, Tebadkan is well known as a region of deprived people. Current study aimed to compare the prevalence of obesity among children living in these two regions of Mashhad.

Materials and Methods

In This cross-sectional study a total of 625 primary school students, 308 girls and 317 boys, were randomly selected from two regions (in 2010, 324 from Sajjad Shahr known as a wealthy urban area and 301 students from Tabadkan known as a rural deprived area through 2010). To calculate body mass index values, their height and weight were measured by the Harpenden stadiometer and a Seca digital weighing scale.

Overweight and obesity were defined as ≥85th and ≥95th percentile, respectively, of age- and sex-specific BMI values from the Iranian BMI reference data. Statistical analyzes were performed using the version 11.5 SPSS software. By using the EPI6 software and based on each subject's height, weight and age the HAZ (Height for Age Z-Score), WAZ (weight for age Z-score) and WHZ (weight for height Z-Score) values were obtained.

Results

The studied population aged 78-127 months with a mean age of 98.2 ± 8.6 months. In overall, the prevalence of overweight and obesity were 7.2% and 5.4%, respectively. BMI ranged 10.99- 27.31 with a mean of 16.20 ± 2.17 kg/m2. Basic characteristics of the participants are presented in Table 1.

Table 1. Basic characteristics of participants in the Sajjadshahr and Tabadkan regions

	n	Minimum	Maximum	Mean	SD
Age(months)	625	78	127	98.24	8.61
Height (cm)	625	112	147	127.69	6.34
Weight (kg)	625	18	52	26.60	5.30

The rate of obesity and overweight and the mean

Corresponding Author: S.M. Ehteshamfar

Department of Immunology, Immunology Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Tel: +98 511 841 2081, Fax: +98 511 841 3006, E-mail address: ehteshamfarm@mums.ac.ir

BMI were 9.3%, 8.9% and 16.5 kg/m2 in Sajjadshahr students, respectively. Corresponding values for students in Tabadkan were 1.3%, 5.3% and 15.85 kg/m2, respectively. Considering the prevalence of both obesity and overweight, their differences were statistically significant with a higher prevalence in Sajjadshahr group (*P*<0.05). Obesity among two gender groups was significantly more prevalent in Sajjadshahr compared with their counterparts in Tebadkan (*P*<0.05; table 2). As presented in Table 2, the prevalence of overweight was also higher in Sajjadshahr than Tebadkan with only being significant for girls (*P*=0.00).

Table 2. Comparing obesity and overweight between the two regions based on sex

Region		Obese	*P*-value	overweight	*P*-value	Normal	Total
Comparing the rate of obesity and overweight in the boys between the two regions							
Sajjadshahr	**n**	16		10		125	151
	%	10.16	0.001	6.6	0.11	82.8	100
Tabadkan	**n**	3		10		153	166
	%	1.8		6		92.2	100
Comparing the rate of obesity and overweight in the girls between the two regions							
Sajjadshahr	**n**	14		19		140	173
	%	8.1	0.003	11	0.00	80.9	100
Tabadkan	**n**	1		6		128	135
	%	0.7		4.5		94.8	100

Comparing the growth indices between the two regions showed that BMI, HAZ, and WAZ were higher in the wealthy region (Sajjadshahr) whereas WHZ was higher in the poorer region (Tabadkan). This difference was statistically significant only for BMI and HAZ (Table 3).

Table 3. Comparing growth indices between students of Sajjadshahr and Tabadkan

	Region	n	Mean	SD	*P*-value
BMI	**Sajjadshahr**	324	16.5	2.705	0.231
	Tabadkan	301	15.83	1.27	
HAZ	**Sajjadshahr**	324	0.103	0.945	0.155
	Tabadkan	301	-0.101	0.835	
WAZ	**Sajjadshahr**	324	0.083	1.19	0.406
	Tabadkan	301	-0.018	0.77	
WHZ	**Sajjadshahr**	324	0.007	1.26	0.154
	Tabadkan	301	0.114	0.865	

Sex differences on growth indices were also yielded in two regions (Tables 4 and 5). While in girls only for BMI the differences were significant; among boys both the WAZ and HAZ indices showed a significant difference. In other words, among the boys of Sajjadshahr region, the height for age Z-score was higher, and the weight for age Z-score was lower than the corresponding values for boys in Tabadkan.

Discussion

In the present study using weight for age indices the prevalence of obesity and overweight was 5.4% and 7.2% which shows that in total 12.6% of the studied population weighed more than normal. Some studies in other areas of Iran and other developing countries have shown similar results (3, 5). While in another study conducted in Tehran, prevalence of obesity and overweight in female primary school students was high with no significant association with socioeconomic factors (4).

To interpret such findings different socio-cultural background methodology of studies and applied standards for overweight and obesity should be taken into account (6). In many studies, a lessened growth in height in the lower socio-economic regions could underestimate the ratio of weight to age in those with a lower socio-economic situation in comparison to the higher socio-economic levels.

Another finding, when comparing the children of the two regions, was the lower HAZ and WAZ scores in the Tabadkan region in comparison to Sajjadshahr. The height growth index is considered as a hallmark of the socio-economic status (7), and therefore the poverty of kids in these regions could be easily shown by this index. It may indicate a needed plan to cover the essential needs of children in such areas.

Height growth among boys of two regions was more

than girls. In general, the reduction in weight growth was less than height growth. Such findings are difficult to interpret but may be due to the effect of poverty or deprivation in early childhood rather than recent years.

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