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Trabajo Original

Pediatría

Prevalence of overweight and obesity among adolescents in eight Arab countries: comparison between two international standards (ARABEAT-2)

La prevalencia de sobrepeso y obesidad en los adolescentes de ocho países árabes: comparación entre dos normas internacionales (ARABEAT-2)

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Abstract

Objective: The aim of this study was to highlight the prevalence of overweight and obesity among adolescents in eight Arab countries.

Methods: A school-based cross-sectional study was conducted in eight Arab countries: Iraq, Jordan, Kuwait, Libya, Palestine, Saudi Arabia, Sudan and Tunisia. The total sample included was 6,447 adolescents aged 15-18 years (3,111 males, 3,336 females). The International Obesity Task Force (IOTF) and World Health Organization (WHO) reference standards were used to determine obesity levels.

Results: The WHO standard provided lower prevalence of overweight but higher prevalence of obesity than the IOTF standard. According to the IOTF standard, overweight among males was highest in Kuwaiti adolescents (24.8%), followed by Saudi Arabian (23.2%). Among females, the highest prevalence was reported in Kuwaiti adolescents (22.1%), followed by Jordanian (20.0%). Regarding obesity, Kuwaiti adolescents showed the highest prevalence of obesity for both males (28.6%) and females (21.1%).

Conclusion: Findings revealed no progress in reducing prevalence of obesity.

Key words:

Arab countries.
Adolescents.
Overweight. Obesity.

Resumen

Objetivo: el objetivo de este estudio fue poner de relieve la prevalencia del sobrepeso y la obesidad en los adolescentes de ocho países árabes.

Métodos: estudio transversal basado en escolares, que se llevó a cabo en ocho países árabes: Irak, Jordania, Kuwait, Libia, Palestina, Arabia Saudí, Sudán y Túnez. La muestra total estuvo compuesta por 6.447 adolescentes de 15-18 años (3.111 hombres, 3.336 mujeres). Se utilizaron para determinar los niveles de obesidad de la Fuerza Internacional de Obesidad (IOTF) y los patrones de referencia de la Organización Mundial de la Salud (OMS).

Resultados: el estándar de la OMS presentó menor prevalencia de sobrepeso, pero mayor prevalencia de obesidad que el estándar de la IOTF. De acuerdo con la norma IOTF, el sobrepeso entre los varones fue más alto en los adolescentes kuwaitíes (24,8%), seguido de Arabia Saudí (23,2%). Entre las mujeres, se informó de la más alta prevalencia en adolescentes kuwaitíes (22,1%), seguido por las jordanas (20,0%). En cuanto a la obesidad, los adolescentes kuwaitíes presentaron la mayor prevalencia de obesidad tanto en hombres (28,6%) como en mujeres (21,1%).

Conclusión: los resultados revelaron que no se ha conseguido ningún progreso en la reducción de la prevalencia de la obesidad.

Palabras clave:

Países árabes.
Adolescentes.
Sobrepeso. Obesidad.

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INTRODUCTION

Obesity has become the main public health challenge in both developed and developing countries (1). A number of potential factors have contributed to explain the global high increase in obesity over the past three decades such as increase in calorie intake, change in composition of diet and decline in physical activity. Concern about co-morbidities associated with increasing obesity has become well recognized. Therefore, up-to-date information on the prevalence of and trends in overweight and obesity is important for assessing their health effects and to evaluate the progress of current prevention programmes (2).

The proportion of adolescents who are overweight or obese is markedly increasing globally (3). Indicators from Arab countries suggest an alarming prevalence of overweight and obesity in children and adolescents (4,5). Adolescence is a crucial stage in the evolution of obesity as well as for starting risk factors for some chronic diseases in adulthood (3). Therefore, this study aimed to provide up-to-date information on the prevalence of overweight and obesity among adolescents in eight Arab countries.

METHODS

The current data were extracted from the ARABEAT-2 project, which was organized by the Arab Center for Nutrition and targeted to explore the social aspects of obesity among adolescents in eight Arab countries, namely Iraq, Jordan, Kuwait, Libya, Palestine, Saudi Arabia, Sudan and Tunisia. The capital or one main city was selected from each country, which were: Mosel, Amman, Kuwait, Tripoli, Gaza, Dammam, Khartoum and Tunisia, respectively. The target group was public school students aged 15–18 years. The data were collected during the 2013–2014 school year. Each centre was responsible for obtaining the ethical approval to carry out the study from their Ministry of Education.

The aim was to include not less than 5% of total students aged 15-18 years in each city. Sample size was calculated with a 5% margin of error and with 95% confidence of interval. The students were selected using a multistage stratified sampling method. Due to the shortage of data on private schools in some countries, only public schools were included in this study. In the first stage, each city was divided into several administrative regions, ranging from two to four regions, based on governmental administration in each country. In the second stage, the public secondary schools were selected proportionally by gender from each administrative region, using a simple random method. In the third stage, the classes (levels 10-12) were selected from each country using a simple random method. The total sample of students in each country was varied depending on the number of selected schools and the number of students in each class. The total sample from the eight countries was 6,447 (3,111 males, 3,336 females). Distribution of the sample by country and gender is presented in table I. It can be seen that the proportion of male to female is almost close in all countries, except in Libya and Palestine, where the proportion of females is much higher than males. This is probably due to unsettlement (in Libya and Palestine) or poverty (in Palestine), which force the males either to become involved in the civil war, such as in Libya, or to withdraw from schools and enroll in work to earn extra income for the family, such as in Gaza, Palestine.

Weight and height were measured according to a standard procedure (6). All measurements were taken with minimum clothing and without shoes. Overweight and obesity were calculated according to both the International Obesity Taskforce (IOTF) (7) and the World Health Organization (WHO) (8) reference standards. Chi-square test was used to measure the statistically differences between the two standards.

RESULTS

Proportions of overweight and obesity among adolescents (15-18 years) in eight Arab countries according by the IOTF and WHO reference standards are presented in table II. In general the WHO standard estimated a higher prevalence of obesity, but lower prevalence of overweight than the IOTF standard. The dif-

Table I. Sample size of studied adolescents (15-18 years) by country and gender

Country	City	Male		Female		Total	
		No.	%	No.	%	No.	%
Iraq	Mosel	410	45.4	494	54.6	904	100.0
Jordan	Amman	400	50.3	395	49.7	795	100.0
Kuwait	Kuwait	343	48.6	363	51.4	706	100.0
Libya	Tripoli	307	40.4	452	59.6	759	100.0
Palestine	Gaza	227	37.2	383	62.8	610	100.0
Saudi Arabia	Dammam	518	53.8	450	46.5	968	100.0
Sudan	Khartoum	488	54.1	414	45.9	902	100.0
Tunisia	Tunisia	418	52.1	385	47.9	803	100.0
Total		3,111	48.3	3,336	51.7	6,447	100.0

Table II. Proportion of overweight and obesity among adolescents (15-18 years) in eight Arab countries by gender, according to IOTF and WHO reference standards

Country		Male			Female			Total		
	Reference	non-obese	Overweight	Obese	non-obese	Overweight	Obese	non-obese	Overweight	Obese
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
High income										
Kuwait	IOTF	46.6	24.8	28.6	56.8	22.1	21.1	51.8	23.4	24.8
	WHO	45.5	14.0	40.5	56.7	12.1	31.2	51.3	13.0	35.7
Saudi Arabia	IOTF	52.5	23.2	24.3	73.8	15.3	10.9	62.4	19.5	18.1
	WHO	53.3	11.2	35.5	73.8	8.0	18.2	62.8	9.7	27.5
Middle income										
Iraq	IOTF	72.7	18.5	8.8	76.5	19.4	4.1	74.8	19.0	6.2
	WHO	72.2	10.5	17.3	76.5	11.9	11.6	74.6	11.3	14.1
Jordan	IOTF	78.3	14.0	7.7	77.0	20.0	3.0	77.6	17.0	5.4
	WHO	78.5	9.0	12.5	76.7	14.7	8.6	77.6	11.8	10.6
Libya	IOTF	76.2	16.6	7.2	73.9	17.9	8.2	74.8	17.4	7.8
	WHO	76.9	9.8	13.3	73.5	10.0	16.5	74.8	9.9	15.3
Tunisia	IOTF	79.4	14.8	5.8	77.4	16.9	5.7	78.5	15.8	5.7
	WHO	79.2	9.6	11.2	77.9	11.5	10.6	78.5	10.5	11.0
Low income										
Palestine	IOTF	77.5	15.9	6.6	77.5	16.5	6.0	77.6	16.2	6.2
	WHO	77.5	9.7	12.8	77.0	11.7	11.3	77.2	11.0	11.8
Sudan	IOTF	91.0	6.5	2.5	87.7	8.5	3.9	89.5	7.4	3.1
	WHO	91.0	3.1	5.9	87.9	5.8	6.3	89.6	4.3	6.1

The differences between two standards were highly statistically significant ($p < 0.001$) among all genders in all countries.

ferences between two methods were highly statistically significant ($p < 0.001$) among all genders in all countries. Using the IOTF standard, the highest proportion of overweight was observed in Kuwaiti adolescents (both males (24.8%) and females (22.1%), followed by Saudi males (23.2%) and Jordanian females (20%). The lowest proportion of overweight was noticed in Sudanese adolescents (6.5% and 8.5%, for males and females, respectively). Similarly regarding obesity prevalence, the Kuwaiti adolescents had the highest prevalence (28.6% and 21.1%, in males and females, respectively), whereas the Sudanese adolescents had the lowest prevalence (2.5% and 3.9% in males and females, respectively). There was some trend that overweight and obesity prevalence increased as per capita income of the country increased.

DISCUSSION

This study is the first attempt to compare the prevalence of overweight and obesity among adolescents in eight Arab countries using two reference standards (IOTF and WHO), as well as using similar methodology. The results suggested a high proportion of overweight and obesity among adolescents (15-18 years) in most countries studied. Even in very poor countries such as Sudan, which is experiencing severe malnutrition and shortage of food, an alarming prevalence of overweight and obesity has been observed in urban adolescents.

The high prevalence of overweight and obesity among adolescents in Kuwait and Saudi Arabia may be due to the rapid nutrition transition, which started earlier in these two countries than in other countries, mainly due to the early discovery of oil in Kuwait and Saudi Arabia. This leads to the improvement in socio-economic status and consequently to changes in dietary habits and lifestyle (3). In general, the difference in the prevalence of obesity between the eight Arab countries could be attributed to ethnic background, socio-economic status, sedentary behaviour, food habits, and timing of puberty (9,10). The higher prevalence of obesity among males than females in some Arab countries may be due to the differences in the timing of puberty, muscular tissue, and food consumption patterns between boys and girls (10,11).

Based on the findings of this study it can be concluded that no progress has been made in reducing the trends of obesity among schoolchildren in Arab countries. Practical and relevant programme to prevent and control obesity in schoolchildren is urgently needed in each Arab country.

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