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Original / *Obesidad*

# Obesity among adolescents in five Arab countries; relative to gender and age

A. O. Musaiger[1], M. Al-Mannai[2], O. Al-Lalla[3], S. Saghir[4], I.Halahleh[5], M. M. Benhamed[6], F. Kalam[7] and E. Y. A. Ali[8]

*[1]Nutrition and Health Studies Unit. Deanship of Scientific Research. University of Bahrain and Arab Center for Nutrition. Bahrain. [2]Department of Mathematics. College of Science. University of Bahrain. Bahrain. [3]Department of Nutrition and Health. Ministry of Education. Dubai. United Arab Emirates. [4]Faculty of Agriculture. Hebron University. Hebron. Palestine. [5]Nutrition Department. Makassed Hospital. Jerusalem. Palestine. [6]Department of Food Science. Faculty of Agriculture. University of Tripoli. Tripoli. Libya. [7]Dietetic Clinic. Damascus. Syria. [8]Elia Nutrition and Health Center. Kuwait. State of Kuwait.*

**Abstract**

***Objective:*** **To determine the prevalence of overweight and obesity among adolescents in five Arab countries, relative to age and sex.**

***Methods:*** **A multistage stratified random sampling technique was used to select the secondary school students from five Arab countries (Kuwait, Libya, Palestine, Syria and United Arab Emirates). The total sample was 3,302 (1,584 males, 1,718 females). Weight and height were measured, and body mass index was used to calculate the proportion of overweight and obesity based on the International Obesity Task Force standard (IOTF).**

***Results:*** **Kuwaiti adolescents showed the highest prevalence of overweight and obesity among both males and females, compared to their counterparts in other countries. There was no trend in the proportion of overweight and obesity by age in any of the countries included in the study.**

***Conclusion:*** **Adolescent obesity has reached a critical level in the Arab countries. Therefore there is an urgent need to establish programs to prevent and control obesity among schoolchildren in these countries.**

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Key words: *Adolescents. Arab. Overweight. Obesity.*

**LA OBESIDAD ENTRE LOS ADOLESCENTES EN CINCO PAÍSES ÁRABES; EN RELACIÓN CON EL GÉNERO Y LA EDAD**

**Resumen**

***Objetivo:*** **determinar la prevalencia de sobrepeso y obesidad en adolescentes de cinco países árabes, en relación con la edad el sexo.**

***Métodos:*** **se empleó una técnica de muestreo aleatorio, estratificado y por etapas para seleccionar a estudiantes de secundaria de cinco países árabes (Kuwait, Libia, Palestina, Siria y los Emiratos Árabes Unidos). La muestra total fue de 3.302 (1.584 chicos, 1.718 chicas). Se midieron el peso y la talla y se utilizó el índice de masa corporal para calcular la proporción de sobrepeso y obesidad basándonos en el estándar de la International Obesity Task Force (IOTF).**

***Resultados:*** **los adolescentes kuwaitíes mostraron la mayor prevalencia de sobrepeso y obesidad tanto en chicas como en chicos, en comparación con otros países. No hubo una tendencia en la proporción de sobrepeso y obesidad por sexo en ningún país de los incluidos en el estudio.**

***Conclusión:*** **la obesidad en adolescentes ha alcanzado un nivel crítico en los países árabes. Por lo tanto, existe la necesidad urgente de establecer programas para prevenir y controlar la obesidad en los escolares de estos países.**

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Palabras clave: *Adolescentes. Árabe. Sobrepeso. Obesidad.*

## Introduction

Pediatric obesity has become one of the main health problems in both developing and developed countries[1]. It is well documented that obesity during childhood is a risk factor for several non-communicable chronic diseases in adulthood[2]. The World Health Organization[3] reported that given the fact that the nutrition transition is evident in all Eastern Mediterranean countries, the growing level of obesity among children and adolescents is particularly worrying from the health point of view. To address the challenge raised by obesity, the Arab Center for Nutrition prepared a strategy to combat obesity in the Arab region[4]. However, this strategy will not be effective without the availability of proper and sufficient baseline data on the epidemiology and etiology of obesity among children and adults in this region.

Studies on the prevalence of overweight and obesity among adolescents in Arab countries are generally few or outdated. Furthermore, these studies used several reference standards to measure obesity, making the comparison of obesity prevalence between countries

**Correspondence:** Abdulrahman Musaiger.
Nutrition and Health Research Unit, Deanship of Scientific Research.
University of Bahrain.
Director. Arab Center for Nutrition.
Kingdom of Bahrain.
E-mail:amusaiger@gmail.com

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rather difficult. Recently, Musaiger et al.[5] provided data on the prevalence of overweight and obesity among adolescents aged 15 to 18 in seven Arab countries, using the same standard, the International Obesity Task Force (IOTF)[6]. However, their data were based on age range, rather than each age separately. Therefore, this short paper aimed to provide information about the prevalence of overweight and obesity among adolescents in five Arab countries by age and gender, using the IOTF standard.

## Methods

This study is a part of a multi-center research project titled ARAB-EAT. Detailed information on the sampling procedure and methodology is described elsewhere.[5] In short, a multistage stratified random sampling technique was used to select the adolescents from secondary schools in big cities in five Arab countries, namely Kuwait, Libya, Palestine, Syria and United Arab Emirates (UAE). Only government schools were included in this study. Each city was divided into administrative areas, and the schools were proportionally selected from each area. Classes were selected by a simple random method for each secondary level (levels 10, 11 and 12).

A standardized protocol was prepared and sent to all participating centers in the five Arab countries. These centers were responsible for training their research teams and obtaining ethical permission from ministries of education. The final sample was 3302 adolescents aged 15 to 18 (1584 boys, 1718 girls). Data were collected between March 2010 and January 2011.

Weight and height were measured with minimal clothes and without shoes, using a standard procedure. Data were analyzed using the SPSS statistical package. The adolescents were classified into three categories (non-obese, overweight and obese) based on the IOTF reference standard[6].

## Results

The weight status of adolescents in the five studied cities by gender and age is presented in table I. In general, there was no trend in the prevalence of overweight and obesity by age. Among Kuwaiti males, the highest prevalence of overweight was reported at age 15 (28.6%), while among females, the highest prevalence was found at age 17 (27.6%). Kuwaiti adolescents showed the highest prevalence of overweight and obesity at most ages, for both males and females, compared with their counterparts in other countries. In Libya, females showed a higher prevalence of overweight than males, at all ages. In Palestine, the prevalence of overweight and obesity was very close among both males and females, except at age 18, where the proportion of overweight among males was almost seven times higher than females (28% vs 3.6%). Obesity was higher among males in Sharjah city at all ages. The trend of overweight and obesity among adolescents in Syria was very close between males and females at all ages.

## Discussion

The current study showed that the prevalence of overweight and obesity among Arab adolescents is relatively high in high economic countries such as Kuwait and UAE and in middle income countries such as Libya and Syria and in low income countries such as Palestine. Furthermore, there was no trend in the proportion of overweight and obesity among various ages.

It is difficult to compare the findings of this study with many previously published data, due to grouping the age in one category or using different reference standards for obesity, or a lack of published data on this age group, such as in the case of Libya. However, when comparing the present findings with those reported earlier in Kuwait[7], using the same reference standard, it was found that the present study showed a higher prevalence of obesity among Kuwaiti males, but a similar prevalence among females. The same observation was made when comparing the present data related to Sharjah city with the national data in UAE[8], for age 10–19, using the same reference standard. Nevertheless, the proportion of obesity among adolescents in Damascus (Syria) was very close to that reported by Nasreddine et al.[9], using the same standard, and at the same age range.

Changes in dietary habits, physical activity and urbanization, as well as the Westernization which occurred in the Arab countries during the past three decades, have contributed to the high prevalence of overweight and obesity[10]. The differences in weight status by age and gender, in each country and among countries, could be attributed to several factors such as dietary habits, physical activity, timing of puberty, race, ethnicity, genetic admixture and socio-economic status[11]. The current study provides useful data for overweight and obesity among adolescents at various ages and by gender, especially for the sake of comparison with other non-Arab countries. The high prevalence of childhood obesity should be considered in any program to combat obesity in Arab communities.

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**Table I**

*Prevalence of overweight and obesity among adolescents in five Arab countries by gender and age, based on the IOTF reference standard*

| | | *15 years* | | *16 years* | | *17 years* | | *18 years* | |
|---|---|---|---|---|---|---|---|---|---|
| *Country (city)* | *Weight status Total (sample)* | *Male (%)* | *Female (%)* | *Male (%)* | *Female (%)* | *Male (%)* | *Female (%)* | *Male (%)* | *Female (%)* |
| **Kuwait (Kuwait city)** | Non-obese | 31.4 | 49.0 | 36.8 | 56.0 | 51.3 | 65.1 | 34.7 | 58.9 |
| | Overweight | 28.6 | 13.7 | 21.8 | 25.6 | 27.6 | 21.1 | 26.7 | 16.1 |
| | Obese | 40.0 | 37.3 | 41.4 | 18.4 | 21.1 | 13.8 | 38.6 | 25.0 |
| | (Total sample) | (35) | (51) | (87) | (125) | (76) | (123) | (75) | (56) |
| **Libya (Tripoli)** | Non-obese | 77.1 | 58.8 | 68.1 | 60.5 | 80.3 | 70.4 | 63.6 | 67.7 |
| | Overweight | 16.9 | 29.4 | 14.9 | 27.7 | 16.1 | 23.5 | 22.7 | 22.6 |
| | Obese | 6.0 | 11.8 | 17.0 | 11.8 | 3.7 | 6.1 | 13.7 | 9.7 |
| | (Total sample) | (83) | (102) | (94) | (119) | (81) | (98) | (22) | (31) |
| **Palestine (Al-Khalil)** | Non-obese | 87.8 | 85.7 | 84.0 | 85.1 | 82.3 | 79.8 | 68.0 | 89.3 |
| | Overweight | 9.8 | 10.7 | 10.7 | 12.8 | 11.4 | 16.5 | 28.0 | 3.6 |
| | Obese | 2.4 | 3.6 | 5.3 | 2.1 | 6.3 | 3.7 | 4.0 | 7.1 |
| | (Total sample) | (41) | (56) | (75) | (94) | (79) | (79) | (25) | (28) |
| **UAE (Sharjah)** | Non-obese | 63.3 | 84.2 | 64.4 | 81.3 | 67.8 | 79.4 | 54.5 | 74.5 |
| | Overweight | 20.4 | 7.9 | 13.3 | 14.0 | 14.4 | 13.2 | 27.3 | 17.6 |
| | Obese | 16.3 | 7.9 | 22.3 | 4.7 | 17.8 | 7.4 | 18.2 | 7.9 |
| | (Total sample) | (49) | (38) | (90) | (86) | (90) | (68) | (33) | (51) |
| **Syria (Damascus)** | Non-obese | 74.2 | 74.7 | 78.5 | 75.1 | 67.6 | 76.6 | 71.2 | 68.6 |
| | Overweight | 21.7 | 20.2 | 15.3 | 19.1 | 23.5 | 19.3 | 21.9 | 24.3 |
| | Obese | 4.1 | 5.1 | 6.2 | 5.8 | 8.9 | 4.1 | 6.9 | 7.1 |
| | (Total sample) | (120) | (99) | (177) | (173) | (179) | (171) | (73) | (70) |

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