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Original Research

The prevalence and characteristics of overweight and obesity among students in Qatar

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ABSTRACT

Objectives: To estimate the prevalence of overweight and obesity using World Health Organisation (WHO) cut-offs for the body mass index (BMI) among students of the general population living in Qatar in the period 2015–2016.

Study design: Cross-sectional study.

Methods: The study includes 164,963 students aged 5–19 years. The body weight and height were measured to calculate the BMI. The WHO standard cut-offs were used to categorise the BMI into severe thinness (BMI z-score <−3), thinness (BMI z-score ≥−3 to <−2), normal (BMI z-score ≥−2 to <1), overweight (BMI z-score ≥+1 to <+2) and obese (BMI z-score >+2).

Results: Overweight and obesity prevalence was 44.8% and 40.4% among males and females and 45.6% and 40.9% among Qatari and non-Qatari students, respectively. Odds of obesity and overweight status were significantly higher among 10–14 and 15–19 age groups than 5–9 years age group ($P < 0.001$). By sex, males had 1.48 times higher odds of having obesity than females ($P < 0.001$), and Qatari nationals had 1.4 times higher odds of obesity than non-Qataris ($P < 0.001$). Although non-Qatari males also had higher odds of being overweight than females (odds ratio [OR] = 1.05, $P = 0.0006$), the opposite was seen among Qatari students (OR = 0.95, $P = 0.01$).

Conclusion: The result of this survey provides evidence of a high prevalence of overweight and obese students living in Qatar. Therefore, preventive strategies are essential in this population to lower the incidence of being overweight and obesity.

Introduction

One of the most significant public health challenges of the 21st century lies in childhood obesity.[1] The World Health Organisation (WHO) estimated that in the year 2015, at least 2.8 million people died as a result of being overweight or obese, and an estimated 35.8 million disability-adjusted life years globally are caused by being overweight or obese.[2] Furthermore, childhood obesity is associated with continuation of obesity into adult life and associated diseases, such as type 2 diabetes mellitus, cardiovascular diseases, asthma and

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cancer.[1] Moreover, obesity in children and adolescents can lead to innumerable emotional, social and financial problems, adding to the implications for future generations.[3] Therefore, it is essential to quantify the extent of the overweight and obesity problem to establish its prevalence among different subgroups, to monitor temporal trends and finally to test the impact of interventions implemented to address the problem.[4]

The preferred measurement of obesity is based on percentage of body fat, which is more accurate but requires special tools to assess. The tools needed to measure body fat may not be entirely accurate and can be impracticable for epidemiological use.[5] The body mass index (BMI) is a commonly acceptable measurement for the determination of overweight and obesity.[6] The BMI is calculated in the same way as in adults, but the results of BMI are interpreted differently because the BMI in childhood is sex and age specific.[7] Hence, a cut-off point related to sex and age is required to define child obesity, based on the same principle at different ages. To investigate the prevalence of obesity, overweight, thinness and severe thinness based on the BMI, the WHO child growth standard is a commonly used reference for the calculation of sex- and age-specific BMI in children and adolescents.[8]

The WHO reference data were produced using information from the 1997 National Center for Health Statistics (from 1 to 24 years) combined with information on preschoolers less than 5 years old from 2006 collected by the WHO.[9,10] The WHO method defines overweight and obesity as a BMI greater than one and two standard deviation, respectively, from the mean of the WHO reference population.

This study is based on the data collected as a part of Qatar's National Nutrition and Physical Activity Action Plan 2011–2016 and Qatar's National Health Strategy. The program described in the present study is an expansion to an existing program that was initiated in 2010 targeting primary healthcare clinics. In the beginning, the growth chart was recorded for the children aged less than 5 years who sought care at the Primary Health Care Center (PHCC) and Hamad Medical Corporation (HMC) clinics. During the academic year 2014–2015, a pilot program was implemented among independent school districts (only). The program further included private schools during the school year 2015–2016, data of which are shared in the present article. The main aims of this initiative are to provide an ongoing database for the growth of students of both sexes, building monitoring systems for students' health status, and early detection of malnutrition, including increased or decreased weight and stunting. The program process is aimed and implemented to become a surveillance system and part of routine physical examination at all schools in Qatar. Its importance relies on the fact that the population in the State of Qatar is experiencing higher prevalence of overweight, obesity and related health outcomes especially among adults.[11,12] Furthermore, a recently published study also identifies gaps in food patterns and diet quality among households.[13] This particular article aims to examine the body weight situation among younger populations in Qatar, which has not been extensively explored in the past at comprehensive levels. The study specifically describes the prevalence and characteristics of the overweight and obesity situation among school-going children and adolescents in the age range 5–19 years in Qatar.

Methods

Sample size and data collection

The data used for this article are collected as a part of the 'Growth Monitoring Program', a cross-sectional study. To implement this program, train-the-trainer workshops were held. The physicians, health educators, nurses and others from the HMC, PHCC and the Ministry of Public Health (MOPH) formerly known as the Supreme Council of Health were trained to develop skills as per the WHO growth charts 2007 materials.[14] This was followed by the training of field teams that included school nurses who eventually collected the data. The program was conducted in collaboration with the Ministry of Education and Higher Education (MEHE) and PHCC, and the research and policy department at the MOPH approved the study and data collection form.

Field teams performed the data collection of 168,011 students aged 5–19 years from 296 private and government schools in the State of Qatar, between November and May (2015–2016) with a response rate of 96.4% based on the total expected population of the reached schools ($N = 173,336$). For analysis, 879 students were excluded because of their out-of-range ages and 2169 because of the out-of-the range BMI; hence, 164,963 students were included in the data analysis. In 2016, Qatar's total estimated population was around 2.6 million with around 12% (~308,000) in the age range 5–19 years.[15]

Ethical procedures were followed throughout the implementation of the project and during data handling process. Data entry and analysis were carried out with confidentiality. The school nurses and administration advocated the importance of this program with parents, explaining this as the only national program that collects information related to the growth and development of the young population in the country. This ongoing surveillance has become a routine at the participating schools as per regulations of MEHE which will be further expanded in the coming years.

The body height was measured in centimetres to one decimal place. Similarly, the body weight was measured in kilogram to one decimal place. The BMI was computed as weight in kilograms divided by the square of height in metres (kg/m^2). Weight and height measurements were taken using the 813 Seca digital floor scale with high-capacity weighing device and Seca mode 206 CM body measure tape, respectively.

Z-score calculation and classification

For each student, the BMI (kg/m^2) measurement was transformed into age- and sex-specific BMI z-score using the following equation:

$$z = \frac{\left(\frac{BMI}{M}\right)^L - 1}{L*S},$$

where L, M and S are the skewness curve, median curve and coefficient of variation curve, respectively. The WHO

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