

Now trending in Riyadh: Increased urbanization equals to more obesity in children and adolescents

The last few decades have seen an overwhelming increase in the number of children and adolescents worldwide that are either overweight or are suffering from obesity. The World Health Organization (WHO) fact file of 2016 placed the global estimates of the number of overweight children under the aged of 5 years to around 41 million, while 340 million children and adolescents age 5–19 years were either overweight or obese.^[1] Childhood obesity is one of the most serious public health challenges of the 21st century that is difficult in terms of not just treatment but also its refractoriness in resolution. Its negative impact on the health of the children does not remain limited but rather extends into adolescence and persists further leading to adult obesity and its related disorders. The problem of overweight or obesity in children is global in nature, which has steadily increased in both the developed (high-income) and the developing (low-income) countries, particularly in their urban settings. Although the rise of obesity has been shown to have plateaued in high-income countries, an accelerated increase has been noted in the Middle-eastern and Asian regions.^[2] This also holds true for Saudi Arabia as is reflected by the number of studies from the different parts of the country that have looked into different factors and aspects that have led to increased obesity burden in children.^[3,4]

The primary cause of increment in the prevalence rates of overweight and obesity is usually attributed to unhealthy lifestyle and behavior. Excess weight is caused by a number of other contributory factors besides nutrition, that include personal, social, and environmental influences, sleep hygiene, and more recently an increase in media usage. There is thus no single cause of childhood obesity; rather, it is a conglomeration of complex interactions between several different risk factors. Children with overweight and obesity are at an increased risk for poor health outcomes due to the development of obesity-associated medical comorbidities. The most characteristic negative impact is the development of associated hypertension, found in 60% of children with obesity in the age group of 5-10 years, and also elevation of total cholesterol, triglycerides, and insulin levels, which are characteristic of both the metabolic syndrome and are risk factors for cardiovascular disease.^[5-7] The health-related quality of

life in children with obesity is also poor and is associated with a risk for psychological and social problems related to negative self-image, social stigma, and low self-esteem. Considering all these factors, it is imperative to understand and estimate the impact of this disease so as to improve the interventional efforts that are needed to address both the physical and emotional consequences of childhood obesity.

Survey instruments have become the major vehicle for generating an understanding of health status, behavioral, and environmental risk factors and for health service utilization. Although it is known that obesity in Saudi Arabia has been increasing in dramatic proportions, no recent estimates for this increase have been provided for a long time. Al-Hussaini *et al.* in their study have tried to address this issue and used a representative sample from school-aged children and adolescents to gather details for providing the most recent estimate of the prevalence of childhood obesity in Riyadh city.^[8] They achieved this by carrying out a school-based survey that encompassed five geographic regions of Riyadh city (North, South, East, West, and Center) using a probability proportionate sampling method. Their cross-sectional study was carried out in 2015 and recruited a large sample of 7931 randomly selected healthy asymptomatic children between the ages of 6 and 16 years attending primary and intermediate schools in Riyadh city. In their study, anthropometric measures including weight, height, and body mass index (BMI) were measured and recorded to the nearest 100 g and 0.1 c. They defined overweight as BMI for age and gender above +1 and below +2 standard deviation scores (SDS) and obesity >+2 SDS based on the WHO criteria. Besides getting the anthropometric measures, the authors also undertook to collect and analyze detailed demographics and socioeconomic status (SES) data from the parents of the participants to identify its relation with overweight or obesity. The parental SES data were collected by gathering the information on four main indicators: parents' educational level, family income, habitation, and parents' jobs, through self-answered questionnaires.

The authors identified that there was a higher overall prevalence of obesity (18.2%) compared to the prevalence to overweight (13.4%) in both children and adolescents).

In addition, they found differences in the weight gain pattern between boys and girls. The girls outnumbered the boys in the overweight group (14.2% vs 12%), while the number of boys was slightly higher than the girls in the obese group (18% vs 18.4%). This finding was similar to the results of a meta-analysis conducted in China by Yu *et al.* who concluded that the number of boys in the overweight or obese group outnumbered the girls.^[9] These gender-based differences can be attributable to the differences in body composition, physical activity, patterns of weight gain, differences in physiology and hormone biology, and different social, cultural and environmental factors. The differences between males and females are important as the consequences of obesity are known to differ between them.^[10]

The authors also carried out an additional analysis by classifying the sample population into different groups based on their ages. They highlight the fact that the prevalence of obesity is more in adolescents (>11 years) than in children (6–11 years) (20.2% vs 15.7%; $P < 0.01$). They also showed a higher prevalence of overweight in adolescents compared with children (14.6% vs 12%, $P < 0.03$). The authors additionally obtained a trend for the changing obesity rates by comparing their findings with previous studies. Comparison between studies is normally challenging because of the different standards and criteria. This is more so in children, because of the variety of growth charts available that define the normal growth percentiles. Al-Hussaini *et al.* were able to carry out this comparison between their results and the results of Al Alwan *et al.*^[11] and El Mouzan *et al.*^[12] as they used similar cut-off criteria (WHO criteria) for overweight and obesity, studied the same geographical region (Riyadh), and used a similar age group. Al-Hussaini *et al.* found that the rate of obesity had increased significantly in 9 years (from 12.7% to 18.2%) using the prevalence rates from Al Alwan *et al.*'s study, and almost doubled over the 10-year period (9.3%–18.2%) using El Mouzan *et al.*'s data. This increase is a red flag that needs to be acknowledged, prompting to make a strong case to initiate and monitor effective implementation of obesity prevention measures. Although one also has to acknowledge that a disparity exists between the urban and rural populations and this limits the study's utility and estimates of obesity to the urban center only.

Another notable finding of the study was the association between the SES and overweight and obesity. Overweight and obesity were found to increase significantly with higher levels of SES. The authors have proposed that the risk of becoming overweight and obese among children is linked

with higher levels of SES and urbanization currently seen in the Saudi society. Hammad and Berry in their recent review also dwelled on the problem of rising childhood obesity in Saudi Arabia. They too have stressed on the strong relationship that exists between obesity and SES, changing dietary habits that include an increased consumption of fast foods and sugar-dense beverages (e.g., sodas) due to an increased income, along with the use of technological advancement such as cars, elevators, and escalators that have limited mobility and encouraged a more sedentary lifestyle.^[4]

The study has a number of limitations as mentioned by the authors. First, it is limited to the urban population of Riyadh and cannot be generalized to the entire Saudi population. Second, the cross-sectional design does not help determine the causality, hence future longitudinal studies should be performed. Third, it does not assess the obesogenic factors. In addition to these limitations, it would have been a better strategy to use the Saudi growth charts developed by El Mouzan *et al.*, to assess obesity, that are specific for the growth patterns of Saudi children.^[12,13]

The study in its essence has identified the alarmingly increasing trend of obesity in Saudi children and adolescents, using a large cohort. It also has shown the direct relationship between obesity and parental SES. It is imperative that we focus on these early years of childhood to identify early dominant factors leading to obesity that may help in formulating evidence-based policies for early interventions and allow for the evaluation of success of these interventions in the prevention of obesity.

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