

Introduction

Obesity is defined as a condition of excess body fat, and it is associated with a large number of debilitating and life-threatening disorders, such as major increases in associated cardiovascular, metabolic, and other noncommunicable diseases. It also contributes to increased mortality rates from all causes, including cardiovascular diseases (CVDs) and cancer (*Must et al., 1999*). Obesity is a natural extension of an advancing economy. As becoming an advancing World economy and getting all these labor-saving devices and low-cost, easily accessible foods, people are going to eat more and exercise less (*Sahota et al., 2001*).

The World Health Organization (WHO) considers obesity a disease and defines it as excess body fat to the extent that health is impaired (*WHO, 2009*). Because the direct measurement of body fat is difficult, the body mass index (BMI), a simple weight-to-height ratio (kg/m^2), is typically used to classify overweight and obese adults (*WHO, 2009*).

Obesity is a complex, multifactorial, chronic disease involving environmental (social and cultural), genetic, physiologic, metabolic, behavioral, and psychological components. It has been increasing at an alarming rate throughout the world over the past two decades to the extent that it is now a pandemic, affecting millions of people globally, and it is the second leading cause of preventable death in the United States. The World Health Organization (WHO) has estimated that more than 300 million people are obese worldwide (*WHO, 2009*).

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Extensive research has been conducted on the relationships between calories, amount of food eaten and body weight. To lose weight a person must eat fewer calories than what he or she expends, People may not limit what they consume based on calories alone. Feeling full is one reason that people stop eating. Short-term studies indicate that the volume of food people eat at a meal is what makes them feel full and stop eating, rather than the calorie content of the food, Water and fiber increase the volume of foods and reduce energy density. In their natural state, fruits and vegetables have high water and fiber content and thus are low in calories and energy density and finally, Fruits and vegetables are good substitutes for foods of high energy density (*Gortmaker et al., 2006*).

Diverging trends of decreasing energy intake and increasing prevalence of obesity suggest that physical inactivity and sedentary lifestyle may be one of the key determinants of the growing rates of overweight/obesity in many populations. Other factors like smoking, Alcohol and caffeine consumption play also a major role. Because the substantial negative health consequences of smoking are far stronger than those associated with modest weight differences, smoking cannot be viewed as an appropriate weight management strategy (*Singh et al., 1999*).

Children who slept less consumed more caffeine and had more hours of screen time (use of television, Internet, computer and video games). A higher body mass index (BMI) was also associated with shorter sleep duration. More hours of

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screen time were also associated with higher caffeine consumption (*Howarth et al., 2001*).

According to the theory of emotional eating stem is the Psychosomatic Theory of Obesity, food is used as an emotional defense in the face of negative affect, which causes over consumption which, in turn, leads to obesity. In addition, it is posited that obese individuals excessively eat in response to these negative emotional states, while normal weight persons do not eat in the face of distress and instead employ other coping mechanisms (*Faith et al., 1997*).

Kuwait with a population of 2.5 million has the highest level of obesity in the world. 75% of the population is obese and childhood obesity is rising. Estimated cost of obesity to Kuwait is a minimum of \$2.8 billion annually in direct and indirect costs. It is therefore proposed, "As a priority, prevalence of obesity in Kuwait is reduced by 33% over the next 2 years. Information about the impact of physical inactivity and sedentary lifestyles on the prevalence of obesity among the general adult population in Kuwait is sparse (*Al-Kandari, 2006*).

This work was done in order to reveal the current situation among youth in Kuwait, and Kuwait University was selected because it is a suitable place for good sample from youth community.

Aim of the Work

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1. To identify BMI among youth.
2. To assess whether lifestyle has an association with BMI in youth of Kuwait.
3. To examine the gender differences in lifestyle and BMI in youth of Kuwait.

OBESITY

Definitions:

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In both adults and children, obesity is commonly assessed with the BMI calculated using weight and height (kg/m^2). The WHO currently defines adult overweight and obesity by using BMI cutoff points of 25 and 30 kg/m^2 , respectively. National Heart, Lung, and Blood Institute (NHLBI) and the North American Association for the Study of Obesity Committee also recommend these cutoff points (*National Heart, Lung, and Blood Institute, 1998*).

The definition of overweight and obesity in children and adolescents is more complex. In children, BMI changes with age during stages of growth. Previous category definitions for children used the terms “at risk of overweight” and “overweight.” To address the issue of childhood obesity, an Expert Committee convened by the American Medical Association in collaboration with the Department of Health and Human Services' Health Resources and Services Administration and the Centers for Disease Control and Prevention (CDC) recommends that children and adolescents (2–19 years) with a BMI greater than or equal to the 95th percentile for age and sex be considered obese and those with BMI greater than or equal to the 85th percentile and less than the 95th percentile for age and sex be considered overweight (*Bravata et al., 2007*).

Epidemiology of obesity:

The obesity prevalence rate increase is evident in Westernized countries, where obesity has been present for

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decades, but today it is also particularly noticeable in less developed countries that previously had not experienced problems with overweight and obesity. For example, the prevalence of obesity has increased by about 10 to 40% in the majority of European countries in the last decade, and it currently affects nearly one third of the adult American population, as well as three quarters of the adult population living in urban areas of Western Samoa in the Pacific (**WHO, 1998**).

Obesity in the developing world reflects the profound changes in society over the past 20 to 30 years that have created an environment that promotes a sedentary lifestyle and the consumption of a high-fat, energy-dense diet, collectively known as the nutrition transition. As poor countries become more prosperous, they acquire some of the benefits as well as some of the problems of industrialized nations, including obesity (**FAO, 2002**).

The rate of obesity greatly increased in the years between 1971 and 2000, whereas the disparity in obesity rates across Socioeconomic Standards (SES) decreased (**Zhang and Wang, 2004a**). SES factors have a stronger impact in Caucasians than in minority groups, with a negative association between SES and obesity in Caucasian men and women but a positive association in African American men and Hispanic men (**Zhang and Wang, 2004b**). African American women, however, who grew up in the most disadvantaged households

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have obesity levels more than twice as high as those of women from less impoverished backgrounds (**James et al., 2006**). For minority women, in addition to low individual SES (income, education, assets), living in a socioeconomically disadvantaged community increases the prevalence of obesity (**Robert and Reither, 2004**).

In addition to SES, education level and choice of occupation have associations with obesity for some race and gender. A 4-year cohort of middle-aged women found that African American women and Caucasian women have similar BMI at the lowest level of education (high school or less) (**Lewis et al., 2005**). The BMI of African American women is higher than that of Caucasian women at the moderate (some college) and highest (college degree or more) levels of education. Compared with Caucasian college students, African Americans and Hispanics are more likely to be overweight, whereas Asian students are less likely to be so. When comparing by gender, male college students are more likely to be overweight and obese than their female counterparts (**Nelson et al., 2007**).

Occupation may be a variable in obesity according to the National Health Interview Survey (**Caban et al., 2005**). Workers in 41 occupation categories participated and identified African American female workers as having the highest prevalence of obesity. For male workers, vehicle operators (31.7%), police, and firefighters (29.8%) have the highest rates of obesity, with no

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occupational groups having obesity rates less than 11% for men. For women, vehicle operators (31.0%) and protective service workers (30.5%) have the highest rates of obesity, whereas architects and surveyors (7.3%) and construction and extractive trade workers (6.9%) have the lowest rates (*Caban et al., 2005*).

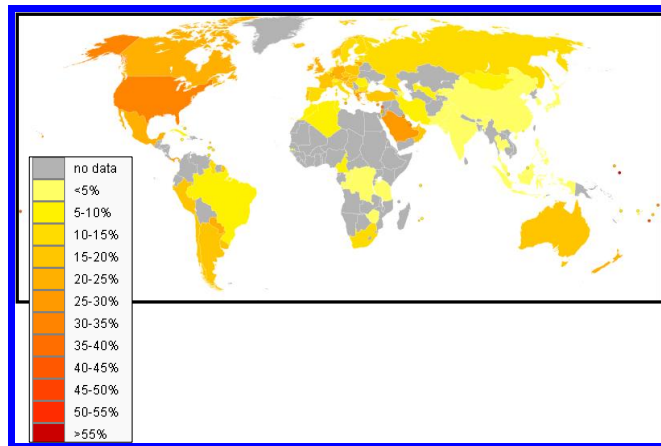


Fig. (1): World map of Male Obesity, 2008

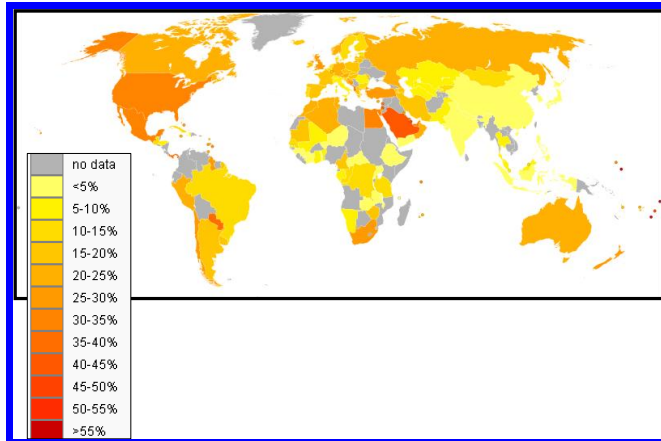


Fig. (2): World map of Female Obesity, 2008.

Obesity in adults:

It should be noted that it is often difficult to make a direct comparison of the prevalence of obesity among countries due to the inconsistent classifications used to define obesity. This problem may be overcome with the adoption in future surveys of the WHO standardized classifications for obesity. From available data, the worldwide prevalence of obesity has been found to range from less than 5% in rural China, Japan, and some African countries to levels as high as 75% of the adult population in urban Samoa. Gender, age, race, and SES all influence the prevalence of adult obesity (**Robert and Reither, 2004; Flegal et al., 2004; Zhang and Wang, 2004a; Zhang and Wang, 2004b**). Obesity levels vary depending on ethnic origin. In the United States, particularly among women, large differences exist in the prevalence of obesity among populations of different ethnic origins within the same country (**WHO, 1998**).

The most recent NHANES data (1999-2004) estimate that among adult men and women (20 years or older), 66.3% are overweight or obese, 32.4% are obese, and 4.8% are extremely obese (**Ogden et al., 2006; Wang and Beydoun, 2007**). Currently, the lifetime risk of being overweight is estimated to exceed 70% and that for obesity exceeds 35% (**Vasan et al., 2005**). The prevalence of overweight and obese adults has increased from 1,950 to 2,000 for both men and women, with the largest increase in BMI greater than 35 (**Flegal, 2005; Parikh et al., 2007**).

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As obesity rises, so does the WC and abdominal obesity. For men, the prevalence of abdominal obesity changed from 12.7% in 1960 to 1962 to 29% in 1988 to 1994 and later 38.3% in 1999 to 2000 (*Okosun et al., 2004*). For women during the same time periods, the prevalence of abdominal obesity increased from 19.4% to 38.8% and then 59.9%. Abdominal obesity has increased in both sexes in African Americans and Caucasians; but in Hispanics, the increase has been seen only in men (*Okosun et al., 2003*).

Europe:

Obesity is relatively common in Europe, especially among women and in Southern and Eastern European countries. A marked trend toward increasing levels of adult overweight and obesity can be found throughout Europe, although prevalence rates differ. Current prevalence data from a report by the International Obesity Task Force (IOTF) suggest that the obesity prevalence in European countries ranges from 10 to 27% for men and up to 38% for women (*Lobstein et al., 2005*).

United States:

The prevalence of overweight and obesity increased over the last decade among the various racial and ethnic groups (*Flegal et al., 2002*).

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Latin America and Caribbean:

Brazil is the only Latin American country to have a nationally representative survey conducted in the last 10 years. The Brazilian PNSN survey indicated that obesity is prevalent in Brazil and is rising, especially among lower income groups. The problem of dietary deficit appears to be rapidly shifting to one of dietary excess (*WHO, 1998*).

Africa:

The South African Health Review 2000 reported obesity rates ranging from 8% among black men to 20% among Caucasian men, but among women the rates ranged from 20% for Indian/Asian women to 30.5% for black women. In North Africa, the prevalence of obesity among women is high. Half of all women are overweight (BMI > 25), with rates of 50.9% in Tunisia and 51.3% in Morocco. Obesity rates (BMI > 30) among this population of women are 23% in Tunisia and 18% in Morocco, a threefold increase over 20 years (*Mokhtar et al., 2001*).

Asia:

People in Asia tend to develop diabetes with a lesser degree of obesity at younger ages, suffer longer with complications of diabetes, and die sooner than people in other regions. Childhood obesity has increased substantially and the prevalence of type 2 diabetes has now reached epidemic levels

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in Asia. The health consequences of this epidemic threaten to overwhelm health-care systems in the region. Urgent action is needed, and advocacy for lifestyle changes is the first step. Countries should review and implement interventions, and take a comprehensive and integrated public-health approach. At the level of primary prevention, such programmes can be linked to other non-communicable disease prevention programmes that target lifestyle-related issues. The cost of inaction is clear and unacceptable (*Yoon et al., 2006*).

Kuwait:

Al-Kandari (2006) studied the prevalence of obesity and its relationship with some sociocultural characteristics in Kuwaiti society. The sample involved 212 men and 212 women, most of whom are overweight and obese. Grades 1 (BMI > 25-30 kg/m²), 2 (BMI > 30-40) and 3 (BMI > 40) of obesity characterize 71.2% of the sample. Most individuals are in grade 2 obesity, 37.2%. Grade 1 obesity is seen in 31.4% of the sample. Obesity increases with age, especially in women. The heaviest women are aged 60 years or older (mean BMI of 33.8), about the same mean as in the 50-59-year-old age group. The highest frequency of grades 1 and 2 obesity occur in women 30-39 years old. Fifty per cent of the underweight women are 20-29 years old or are over 60 years old. Most women of normal weight are 20-29 years old. For the men, 60% of the underweight sample is 50-60 years old. Male respondents between 30 and 39 years old are the heaviest; 42.7% of the sample is within grade 1 obesity and 40.7% of the sample

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within grade 2 obesity. The smallest percentage of men in grades 1 and 2 obesity are those 50-59 years old. An association was found between some sociocultural variables and obesity. Data show an increasing prevalence of obesity in Kuwait compared with some previous studies.

Obesity in children and adolescents:

Socioeconomic status (SES) relates to rates of overweight and obesity for some children and adolescents. In families below the poverty line, older adolescents (15–17 years) are more likely to be overweight, but no effect is seen on younger adolescents (12–14 years) (*Miech et al., 2006*). The relationship of childhood overweight and family income varies by race (*Freedman et al., 2007*). For Hispanic children, lower family income is related to increasing BMI percentile. Among African American children, increased family income is associated with increased BMI, and among Caucasian children, prevalence of overweight is fairly constant (*Wang and Zhang, 2006*). As the rates of obesity in children increase, SES inequalities are diminishing with time (*Zhang and Wang, 2007*). With the large increases in obesity, both low- and high-SES groups may be affected.

Kuwait:

Badr (2004) conducted a study to estimate the prevalence of obesity among first grade high school male students in Kuwait to investigate the relationship between body mass index (BMI) and personality types. The study concluded

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that the prevalence of overweight and obesity is quite alarming. The fact that obesity is a mass phenomenon is highlighted by the lack of association of an increased BMI with most demographic and socioeconomic variables. In addition, study stated that an urgent action must be taken in order to control the increased obesity epidemic.

El-Bayoumy et al. (2009) conducted a cross-sectional study was to find out the prevalence of obesity and overweight among intermediate school adolescents aged 10 to 14 years. The study comprised a multistage stratified random sample that included 5402 children (2657 males and 2745 females). They represent 12.7% of the total number of children between 10 and 14 years during the educational year 2005-2006. BMI values higher than 95 percentile were accepted as being obese and those in between 85 and 94 percentile were accepted as overweight. Dietary intake was assessed by the investigators using food exchange lists designed by American Diabetic Association and physical fitness was measured by modified Harvard step test. Data regarding monthly income of the chosen sample were collected from parents of those children. The overall prevalence of overweight and obesity in adolescent Kuwaiti children aged 10 to 14 years was 30.7% and 14.6%, respectively. The overall prevalence of overweight and obesity among males was 29.3% and 14.9%, respectively ($P < .001$) and the prevalence of overweight and obesity among females was 32.1% and 14.2%, respectively ($P < .001$). High daily caloric intake by the obese and overweight children and physical inactivity was reported among the majority of them.