

Comparative study of obesity between men and women: Review

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Abstract

Obesity is disorder in a foremost nutritional health it's developed with countries developing. Also is known as increasing in fat accumulation that lead to problem in health, besides may coin one of the reasons lead to loss of life, the obesity not effect on adults just but effect on offspring and juveniles. In some of inhabitants the incidence of obesity is superior in female than in male; on the other hand, the variation degree of the between the gender differ by country. Obesity is generally measured by body mass index and waist circumference, Obesity are classified according to body mass index into: Pre obesity sort 1 : (25 - 29.9) kg/m², Obesity sort 2 : (30 - 34.9 kg/m²) and extreme obesity sort 3: (40 kg/m²) or greater. Obesity is described by a pathologic condition with augmented overall of cholesterol, triglycerides, LDL cholesterol while reduced of HDL levels. There are many hormones causes pathophysiology of fatness such as adipokines, gut correlated hormones and ghrelin, numerous studies have revealed that the association among fatness and the metabolic sickness such as Insulin resistance, activity of lipoprotein lipase in muscle reduction and free fatty acids increasing. Conclusion: Obesity and overweight different between men and women according to quality of life in different population and countries.

Keywords: Obesity, gender, Hormones, Insulin resistance, pathogenesis.

Introduction

Obesity is one of the most important nourishment illnesses which developed with countries progress (1). The World Health Organization (WHO) stated fatness equally the biggest worldwide chronic disorder which is more danger than malnutrition (2). Many studies revealed that many factor such as changes in nutritional behaviors and lifestyle, stress, and inactivity which causes over weight (3). Obesity may consider risk factor for many diseases such as hypertension, diabetes, psychosocial and physiological sides, in both sex since 1985 (4,5). The study in Iran recorded obesity rate in people 18 years old has 21.5% higher in woman more than men (6). In Iraq, the patients with overweight or obesity about (55.1%) of the population (women about

54.7% and 45.3% of men)(7).In Riyadh, the Saudi Arabia patients with the overweight incidence was 26.3% while obesity about 31.1% nearly. The frequency of obesity was greater in women(36.5%)than in males (25.1%) significantly (8).The study in Turkey revealedthat the overweight frequency was 34.2% of population (the women was 33.5% and men was 36.3%) while the obesity frequency was 23.7% (the women was 32.4% and men was 14.1%) (9),other study showed data overall incidence of obesity was 49.7%in Jordan in 1998, (32.7% in males and 59.8% in females) (10).Prevalence of obesity in South Africa is great, particularlybetween the poorest women that reflects that obesity is associated to poverty (11). Obesity was joiningbetween those with not as much of education, also in women of a lower working statusin England in 1996(12).Data from survey of National Health and Nutrition Examination (NHANE) in 2013–2014(overweight in adults were more than 1 in 3,the overweight also obesity were more than 2 in 3 adults,obesity in adults wereMore than 1 in 3,the adults have extreme obesity about 1 in 13,children with obesityabout 1 in 6 while in adolescents with obesity 2 to 19(13-16).

Classification of obesity

Obesityor fatness is generallymeasured by body mass index (BMI). It is equal from measured weight (kg) of body/ divided by heightsquared (m²). Obesity are classified according to BMI into:

- 1.Pre obesitysort1: 25 - 29.9 (kg/m²)
2. Obesity sort2:30 - 34.9 (kg/m²)
- 3.Extreme obesitysort3: 40 (kg/m²) or greater (17).

However, other way of determining the obesity inhumans with overweight or obesity iswaist circumference (WC) which increasing in patients with obesity: in man 102 cm more than women 88 cm(18).

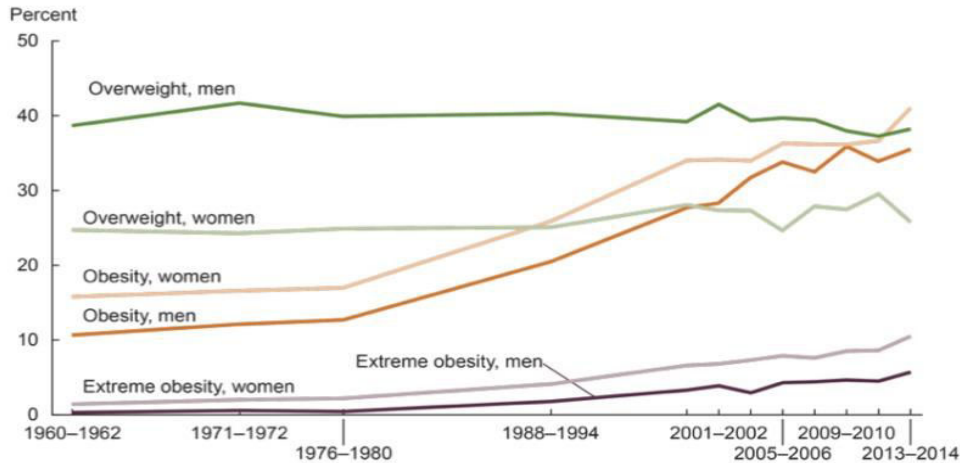
Percentage estimation of adult's patients with overweight orobesity by gender in US, 2013–2014 NHANES Data

About in men have overweight or obesity 73.7 % (3 in 4) while in women 66.9 % (2 in 3). In men have overweight 38.7% (1 in 3) while 26.5% about (1 in 4) in women. Obesity was greater in women about 40 % than men about 35 %. Also extreme obesity was in women about 9.9 % more than menabout 5.5 %(Table 1).

Table 1:Measurement of adult's patients with obesity percentage by genderin US,NHANES data

	Total (%)	Momen (%)	Men(%)
Overweight or Obesity	70.2	66.9	73.7
Overweight	32.5	26.5	38.7
Obesity	37.7	40.4	35
Extreme obesity	7.7	9.9	5.5

The obesity incidences in US people in 1960's, the overweight was stay stable in both men and women extremely, because numerous factors as ecological and genetic factors, while increasing in obesity from (0.9% in 1960-1962 - 8.1% in 2013-14), also increasing in extreme obesity incidence in people (19, 20) (Figure 1).



NOTES: Age-adjusted by the direct method to the year 2000 U.S. Census Bureau estimates using age groups 20–39, 40–59, and 60–74. Overweight is body mass index (BMI) of 25 kg/m² or greater but less than 30 kg/m²; obesity is BMI greater than or equal to 30; and extreme obesity is BMI greater than or equal to 40. Pregnant females were excluded from the analysis.
 SOURCES: NCHS, National Health Examination Survey and National Health and Nutrition Examination Surveys.

Figure 1: Obesity, and extreme obesity in both men and women in US, (1960–1962 , 2013–2014).(19,20).

In other study, WC in men and women in US, it has been discovered that WC have increasing in men and women (Figure2) (21).

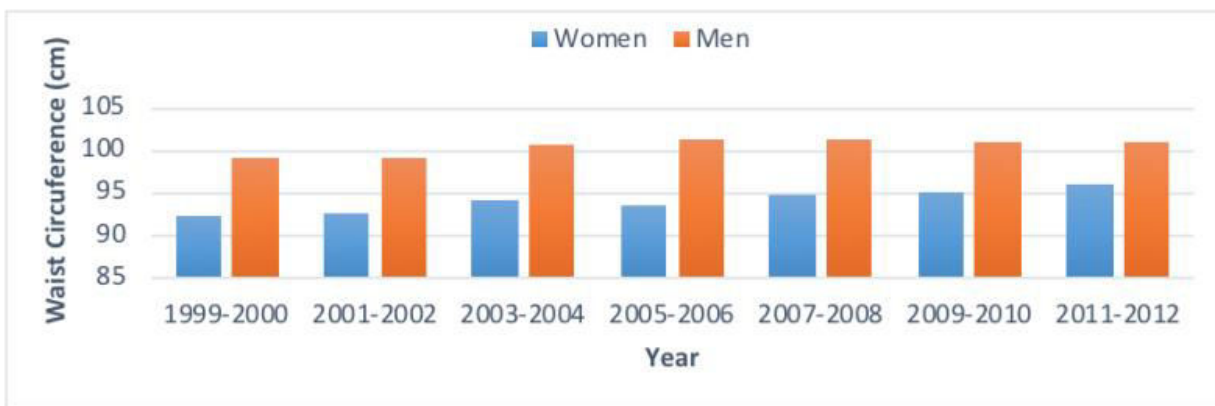


Figure2: Waist circumference of men and women in NHANES Data 1999-2012(21).

In most country the incidence of obesity is greater for adults women more than men; because of the variance between the genders significantly by country (22,23).

the women with obesity incidence exceeds of men about 4% in USA, while in South Africa and Kuwait the female excess is about 29% and 26% respectively, the incidence is larger in men more than in women. However, these difference nearly tend to be small (0,5%) in a handful of largely high-income countries (HICs). Because the reproductive role of women is associated in rising the obesity incidence (24,25).

Causes and risk factor

Obesity is described by defect with augmented overall of cholesterol, LDL cholesterol and triglycerides, while reducing in level of HDL cholesterol. This change in metabolic state is public in persons with obesity and exclusively in individuals with central obesity. Numerous studies have revealed that the association among obesity and the other metabolic conditions such as Insulin resistance, activity of lipoprotein lipase in muscle reduction and free fatty acids increasing (26,27). There are other factors correlated with obesity and disorders of endocrine systems as loss function of ovarian and cancers related with irregular in hormones which are interrelated to obesity and fat spreading. Central obesity is related with testosterone level decreasing in men. Also glucocorticoid concentration change and plasma cortisol level increasing (28). About 90% of diabetes mellitus (DM) type 2 patients are usually related with occurrence of numerous degrees of obesity. Because of change in age, ethnicity and sex, about 50-90% in patients with diabetes have over 25 kg/m² body mass index, whereas in patients with diabetes have over 35 kg/m² body mass index are nearly twenty times more than individuals with body mass index in the normal range 18.5-24.9 kg/m² in Caucasians (29, 30). Figure 3 showed body mass index and developing risk factor of diabetes mellitus type 2 in both gender.

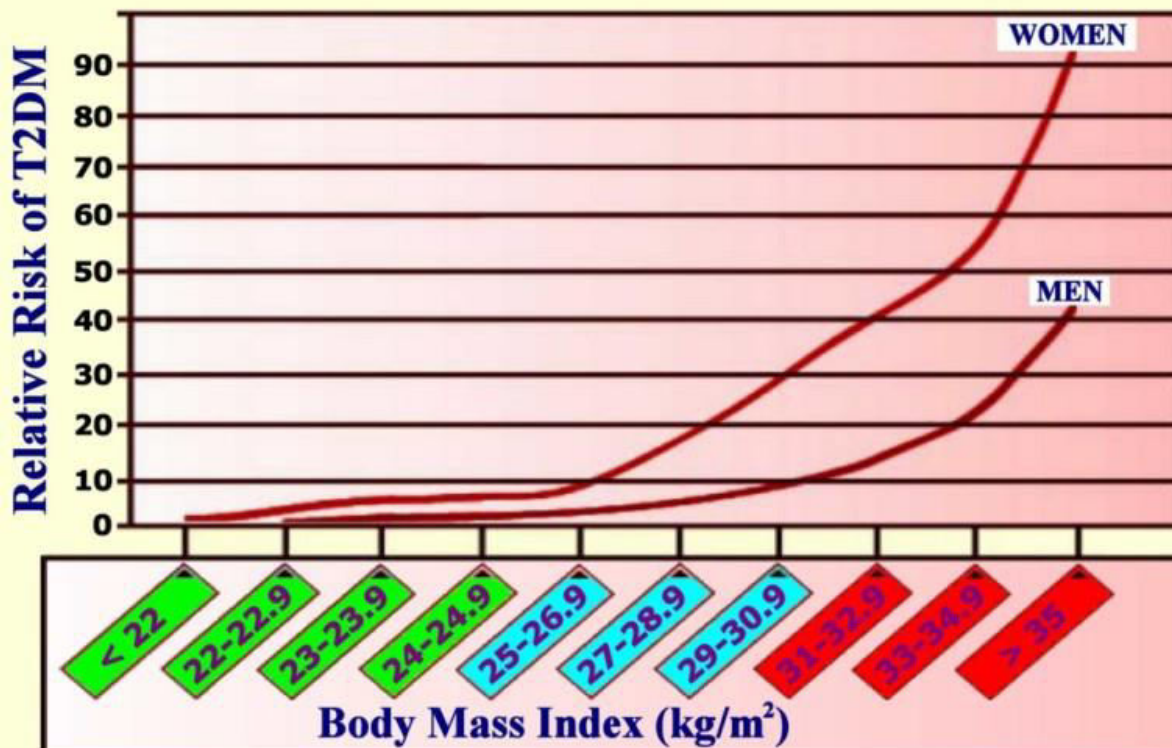


Figure 3: Body mass index with diabetes mellitus type 2 risk factor in both gender (based on data from (31) and (32)).

Pathophysiology mechanism in both sex

There are many hormones causes pathophysiologic way of obesity such as adipokines, hormones linked with gut and ghrelin. It is peripherally acting and is answerable for stimulating appetite (33). The adipokine hormones are formed via the adipocytes, which play important role as key of secretory products such as tumour necrosis factor- α (TNF- α), adiponectin, leptin and interleukin-6 (IL-6). Effect of TNF- α in overweight and obesity has associated with insulin resistance during releasing of fatty acids, also adiponectin production reduction also damage in insulin signaling (34). Adiponectin is derived from protein in plasma which is insulin sensitive and insulin resistance, also play important role as anti-inflammatory and antiatherogenic. However, levels of adiponectin returned toward typical planes when weight loss occurrence (35, 36). Secondary reasons of obesity include: medications, as well as neuroendocrine diseases (37). Other important risk factors of obesity development such as great energy diet, augmented portion size, decreasing physical movement and eating disorders (38, 39). All these behavioral in addition to environmental influences causes modifications in structure of adipose tissue included inflammation, hypertrophy or hyperplasia of adipocytes, and secretion as adipokines (40, 41). However there are many genes have associated with the pathophysiological effect of overweight (42, 43). The genes comprised (beta-3-adrenergic receptor gene, also melanocortin-4 receptor gene, peroxisome-proliferator-activated receptor gene and other hereditary polymorphisms (44).

Effect of obesity on fertility

The obesity is equivalent with infertility increasing in male as showed through the using artificial reproductive technologies (ART) by couples particularly intracytoplasmic sperm injection (ICSI) (45, 46). The obesity in male causes sperm quality reduction specially varying molecular organization in germ cells and sperm in the testes (47-49). Likewise, the evidence of paternal healthiness may be handed to the next descent with increasing of autistic spectrum syndromes in male (50), also ecological contacts related with increases in prevalence of disease in childhood (51, 52). Other evidence that the obesity in male destruct fertility by alternates of hormone concentrations lead to changes in function of sperm and (53).

Most of the conditions of ovulation in women are anovulation. The axis of the hypothalamus hypophysis ovary in prepuberal stage of girls stay inactive till it becomes with critical range of weight and structure, kisspeptin releasing and activation of FSH-LH which symbols beginning of puberty remaining generative living (54). Overweight and obesity is related with some disorder as polycystic ovarian syndrome (PCOS) characterized by hyperandrogenemia. The hyperandrogenemia encourage programmed cell death (apoptosis) of granulosa cells, maladjustment in function of pituitary gland leads to aromatase activity increasing of peripheral tissues also increasing of gonadotrophin secretion feedback (55). Alterations in hormones related to endometrial effect with a greater frequency of endometrial cancer in patients with obesity (56). leptin and leptin receptor perform important role of the implantation regulation. Obesity interrupts leptin and leptin receptor may be lead to effect on implantation and reduced fertility (57).

Psychological effect of obesity

Obesity and infertility are the significant risks of psychological instabilities in women and men through reproductive period. The psychological instabilities and mood illnesses may impair the hormonal regulation and infertility management [58]. Disorders in releasing of serotonin are the reason increasing in consumption of carbohydrate in food with reducing in physical activity (59). Moreover, stress and depression are related with augmented of activity in hypothalamic-pituitary-adrenal alignment, its prolonged activation and extreme level of cortisol may be lead to fat accumulation, particularly of visceral area. (60). The epidemiological data of many studies discovered greater incidence of mood syndromes as depression in women with obesity but not in men with obesity than in overall population (61-64). The incidence of depression signs between obese patients mentioned together a conservative and medical treatment of obesity (65-68). It is recommended that the over demonstration of depressive issue in women with obesity is related with eating syndrome (69). Mood syndromes in patient with obesity may be partially associated with few self-respect. Discrimination in society of obese first in childhood, negative appearance of character and feeling with lower attractively that is more than in women (70). Therefore, women with obesity have low self-respect which influences them lead to development of mood syndromes (71). Obesity morbidity is linked with the social discrimination, bottom most health and quality of life, in addition to increasing turn for food consumption (72). Recently, many studies showed that the body mass associated with pain (73). Additional risk influences by development of depression of patients suffer from obesity are chronic pain in body, disability of self-care, and difficulties in activity (74).

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