

Obesity and its Health Consequences: A Review

Olayinka Victor Ojo*

Federal Medical Centre Jalingo, Taraba State, Nigeria

***Corresponding Author:** Olayinka Victor Ojo, Federal Medical Centre Jalingo, Taraba State, Nigeria.

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Abstract

Obesity has different impact on the health and its an urgent and growing health problem of critical concern and the cause of obesity are complex and multifunctional which leads to an excess calorie intake and inadequate energy expenditure. It also a risk factor for metabolic disorders and leads to serious health consequences for individuals and the burden for the health care system as a whole literature search showed that it is related to at least 18% co-morbidities which are attributable to obesity more over individuals more often suffers from physical and medical, mental, social and psychological challenges affecting virtually all ages and socioeconomic group and the health consequence range from increased risk of premature death, to serious chronic condition that reduce the overall quality of life. Obesity is a risk factor for the development of various diseases like CHD, hypertension, stroke, NIDDM, osteoarthritis, sleep apnea and cancers of endometrium, breast, prostate and colon. Psychological Consequences of obesity range from lowered self-esteem to clinical depression the literature has been extensively reviewed to give an overview of the cause. Health problem associated with the disorder, the mode of assessment of the degree of obesity, its consequences and various method of managing obesity with emphasis on diet and exercise. This study was aimed highlighting the etiology of obesity, its classification, its assessment, associated health problem and its management. Weight reduction may be lifesaving so it necessary to reduce weight.

Keywords: *Obesity; Health Consequences; Overweight*

Introduction

Obesity in most countries has been of great concern globally [1]. This is estimated to be the cause of more than 3.4 million death, 4% of disability-Adjusted life years (DALYs) all around the world [2]. This problem of obesity is a source of concern due to its high rate of morbidity and mortality [3]. Prevalence of obesity is most often estimated based on survey as population study. Not only that data on prevalence and trend are based on measurement of weight rather than body fat [4]. This is not seen in the western world also but also in the poorest developing countries, amongst the successful group: readily recognizable by their protruding abdomen which is as an effect of overeating and over drinking. The problem has been observed to be worse in the developed countries of the world [5]. It has been observed that the site in which excess fat tend to accumulate like the abdominal wall, the hip, thighs and the chest could bear inpatient relationship to the development of most chronic disease of our time [6].

The increase in body mass present public health outcomes of overweight and obesity [1]. Health condition of obese persons is often worse than person with normal weight and life. Span of obese person is an average shorter by two years [7]. There are functional difference between adipose tissue in the abdominal region and that in the gluteal femoral region. It has been found that during stress, there is

release of catecholamines, which preferably cause increased lipolytic activity, together with depressed lipoprotein lipase activity in abdominal adipocytes as compared with femoral adipocytes [8]. There is high concentration of free fatty acid (FFA) released in the liver from the portal vein which predisposes to the risk of diabetes mellitus, cardiovascular disease, pulmonary embolism, osteoarthritis, gall bladder disease, cancer and increased risk of disability. It has been emphasized that obesity is associated with considerable pain, decreased physical function and vitality, worry, depression, social and psychological handicaps [5]. It has also been linked to eating disorder and low self-esteem [9]. This study is therefore aim to highlighting the etiology of obesity, its classification, its assessment, associated health problems and its overall management.

Etiology

Obesity is the result of genetic, behavioural, environmental psychological, social, cultural factor that result in the energy imbalance and promotes excessive fat disposition. The relative contribution of each of these factor has been studied extensively and although gene play an important role in regulation of body weight. The World Health Organization consultation on obesity [10] concluded that behavioural and environmental factors are primarily responsible for dramatic increase in obesity during the past 2 decades. Drug such as steroid, contraceptive pills, anti-depressants and many others have been shown to cause obesity as side effect [11].

Classification of obesity

Obesity can be classified into two types:

- Android obesity (central obesity): In this type of obesity the fat is mainly on the upperparts of the trunk (on the chest and abdomen).
- Gynoid (peripheral obesity) in which the fat is mainly around the hips and thighs [12].

These two forms of obesities could be observed in both sex but the android (central obesity) is more characteristic of male while the gynoid (peripheral obesity) is of female. Studies have shown that there are functional differences between the different fat depot in women in relation to physiological state like pregnancy, lactation and with age before and after menopause [13].

Assessment of obesity

The guide to access obesity which is best accepted is the Body Mass Index (BMI) [14], a value that is determined by dividing body weight (in kilogram) by the square of height (in meters) ($BMI = \text{kg/m}^2$). BMI is considered a reasonable surrogate measure of overall adiposity in general population. In adult, overweight is defined as $BMI > 25.0 \text{ kg/m}^2$ and obesity is defined by BMI of $> 30 \text{ kg/m}^2$ regardless of sex [15]. Waist/hip circumference ratio (WHR) a measure of intra-abdominal or central obesity, predict long term disease risk in both men and women independent of BMI [16]. The world health organization has identified some specific waist circumference value that signify increased health risk ($> 80 \text{ cm}$ for women, $> 94 \text{ cm}$ for men) and substantially increased health risk ($> 88 \text{ cm}$ for women, $> 102 \text{ cm}$ for men) [17].

Waist circumference correlates well with BMI ($r = 84 - 80$) [18] requires only a tape measure and provide an estimate of abdominal fat [19]. Abdominal fat is more strongly associated with health risk and fat stored in other regions of the body [20]. Although BMI and waist circumference are the recommended and most clinically feasible means of identifying patients who are overweight or obese in clinical practice, numerous body composition assessment technique are available [21].

| Weight category | BMI (kg/m ²) |
|-----------------|--------------------------|
| Underweight | < 18.5 |
| Normal weight | 18.5 - 24.9 |
| Overweight | >/25.0 |
| Pre obese | 25.0 - 29.9 |
| Obese | >/ 30.0 |
| Obese class 1 | >/ 30.0 - 34.4 |
| Obese class 2 | >/35.0 - 39.9 |
| Obese class 3 | >/ 40 |

Table 1: World health organization’s body mass index (BMI) categories based on increasing health risk [12].

Consequences of obesity

The consequences of obesity on the main dominant health can be divided into four segment which include medical health, mental health, and social health and the adverse effect of those in the general population is overwhelming and disputable.

Medical health consequences of obesity are co- morbidities related such as metabolic syndrome characterized which include cancer, type 2 diabetes, hypertension, stroke, coronary artery disease, congestive heart failure, asthma, chronic back pain osteoarthritis, pulmonary embolism, gall bladder disease.

There is also consistent association between overweight and obesity in childhood and adolescence with increased risk of both premature death and mortality particularly cardio-metabolic morbidity [22]. Gynaecology and obstetrics problem do arise as a result of obesity [23] such as mestral disorder which is a result of abnormalities of sex hormones such as increase in the production rates adrenal androgen and prolong labour difficulty is one of the main effect of obesity women due to poor quality of abdominal muscles [24] while birth defect, especially neural tube defect, infertility, feta lane neonatal death and delivery of large for gestational age (LDA) infant [24].

Mental health has no clear relationship with obesity, however obesity is a stigma and the obesity discrimination can lead to some mental disorder [25]. Scientific evidence lays emphasis on an increasing risk of low self-esteem, mood disorder, motivational disorder, eating problem, impaired body image, interpersonal communication problem and all these directly or indirectly affects the quality of life [26]. In some cases, obesity discrimination leads to development of psychopathology and poor health behaviour that through a vicious cycle will enhance over eating, bulimina or other related problems [26]. Obesity has impact on different aspect of mental health including mood disorders, communication problem, self-satisfaction that affects different aspect of life [27].

Social health

The consequence of obesity there is attributed to stigmatization in which discrimination is documented on all key areas of living including growth and development, educational process, employment structure and provision of health care [26]. The obese individuals are most often ridiculed by their teachers, physician and public at times they also suffer social bias rejection and humiliation.

Management of obesity

The goal of obesity treatment is to improve the patient’s health and quality of life via pharmacotherapy, as last resort surgery in severe obesity while primarily dietary changes and regular exercise are the ultimate. Modest weight reduction has been associated with significant improvement in hypertension, lipid abnormalities and glycemic control [29].

Exercise

There is a consensus that virtually all individuals not only obese person can benefit from regular physical activities. An exercise program of moderate physical activity if undertaken regularly by overweight individual can increase maximal oxygen uptake and this cardio-respiratory fitness and weight loss [30]. Clinical guideline suggests life style based approaches for at least six month before embarking on drug therapy.

Dietary changes

Education on the type of food to be taken is very important and eating in between meals should be discouraged. Successful weight loss requires that more energy should be expended than consumed on a daily basis. The key of all positive long term dietary changes however is to adopt what is called the "prudent diet" which emphasized lots of vegetables, fruit, whole grains, fish and low fat dairy products [31] as against the western diet which comprise of red meat or processed meat, a lot of fried high-fat-dairy product, refined grains, sweet and dessert.

Chemotherapy

Weight loss medications have the sole objective of suppressing appetite. The use of drugs should be considered as an adjust to diet and exercise modification when reduced calorie diet and life style changes do not promote weight loss after a period of time when used alone, anti-obesity drugs have been associated with suboptimal weight loss [31].

Surgical intervention

Gastrointestinal surgery is the most effective treatment for severely obese persons who weight failed to reduce through diet, exercise and medication or who have serious obesity related health problem. Weight loss surgeries are of two types: malabsorption or restrictive operation. The most common malabsorption operation is gastric bypass (GBP) which is considered the gold standard bariatric operation. However gastric bypass require considerable nutritional supplementation and close follow up patients may experience vomiting, weakness, faintness, sweating, diarrhoea and ulcer. The second type of weight loss surgery is the restrictive operation which reduces stomach size. Adverse effect of the surgery includes pulmonary embolism, gastrointestinal leak, deep venous thrombosis and wound infection [31].

Conclusion

Obesity and its impact on health must be considered as one of the most important public health priority and it necessary to emphasize that the adverse effect of obesity on health care indisputable and life style intervention at personal and societal level are important comprehensive intervention and strategies towards prevention and control of obesity should be encouraged on individual basis and at the community level.

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