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Obesity and Its Related Diseases: A New Escalating Alarming in Global Health

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Abstract

At present rising of obesity becomes a principal public global health and economic concern. In 1997, the World Health Organization (WHO) has declared the obesity as global epidemic. About one-third of the world population is now suffering from overweight or obesity. It is estimated that some diseases, such as hypertension, cardiovascular diseases, Alzheimer disease, asthma, metabolic syndrome, liver steatosis, gallbladder disease, osteoarthritis, obstructive sleep apnea, certain types of cancer, hypercholesterolemia, metabolic syndrome, musculoskeletal disorders (joint and muscle pains), and type 2 diabetes are increased globally due to obesity. Obesity can affect nearly every organ system of human body and even may cause of total heart failure. On the other hand, obesity is incurring substantial costs for healthcare that are already affected the society. Obesity can be prevented, avoided, and cured. Prevention of obesity is the best policy, but proper treatment is necessary who are already affected with obesity. This article tries to discuss aspects of obesity, such as causes and prevention of obesity.

Keywords: overweight, obesity, body mass index, exercise, healthy balanced diet

1. Introduction

Overweight and obesity are two main consequences of many chronic diseases. Overweight is defined as an individual having a Body Mass Index (BMI) of 25 to 29.9, and obesity is defined as an individual having a BMI of 30 and above (WHO, 2020). Obesity is a multifactorial chronic disease that is developed in human body when series of excess food taking happens such a way that energy intake exceeds consumption, i.e., the excess amount of calories is taken in and less is burnt (Goettler et al., 2017; Chooi et al., 2019). Actually, excess weight gain is usually unintentional and gradual, and it is often difficult to reverse without an individual's commitment and will (Health Department of South Africa, 2015). Obesity is known as a critical public health issue, and at present it becomes a headache to medical science. It is a chronic or non-communicable disease (NCD), and is measured as the fifth foremost reason for global mortality (WHO, 2014, 2016). It is considered as the "*New World Syndrome*" that reduces life expectancy (Nammi et al., 2004).

Many nations in the world, especially in Africa, Asia, and Latin America are still struggling against starvation, hunger, and malnutrition. On the other hand, some nations in Europe, America, Australia and New Zealand are facing remarkable problems due to the rise in overweight and obesity; also some nations in the world are suffering from both (Kumanyika et al., 2013). From the last 40 years, obesity is dominating as a global epidemic and is raising non-communicable diseases (NCDs) alarmingly that threaten the global humanity. Obesity increases risk of human life, which is directly related to some diseases, such as hypertension, cardiovascular

diseases, Alzheimer disease, asthma, metabolic syndrome, liver steatosis, gallbladder disease, osteoarthritis, obstructive sleep apnea, certain types of cancer, hypercholesterolemia, metabolic syndrome, musculoskeletal disorders (joint and muscle pains), and type 2 diabetes (Bray et al., 2017; Grant et al., 2018, WHO, 2020).

The World Health Organization (WHO) defines obesity as an "*abnormal or excessive fat accumulation that may impair health*", and one of "*the fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended*" (WHO, 2014, 2016). In 1997, the World Health Organization (WHO) formally declared the obesity as global epidemic (WHO, 2000). In the 20th century, overweight and obesity were only problems of developed countries. But in the 21st century, these are increased in lower developed and developing countries due to the popularity of junk food, changing lifestyles, increasing incomes, urbanization, and aggressive marketing (Popkin, 2004; Goettler et al., 2017; Lee et al., 2022). During the last two decades, the rates of obesity have increased rapidly in developing countries (Zhang et al., 2018). In 2017, more than 15% of deaths were related to obesity in many developing countries, such as in Eastern Europe, Central Asia, North Africa, and Latin America. In the developed countries, this rate ranges from 8% to 10% (Ritchie & Roser, 2020).

The largest incidence of obesity is in Europe and the USA. In 2017, in the developed nations, 7 out of 10 men and 6 out of 10 women were overweighed. On the other hand, both men and women, 3 out of 10 were obese. Also, the prevalence of severe obesity $BMI \geq 40$ has increased since 1993 in both men and women (Bajorek & Bevan, 2019). At present more than 1 billion (1 in 8 people) people are obese worldwide; among them 650 million are adults, 340 million are adolescents, and 39 million are children (WHO 2011, Obesity Statistics, 2023). On the other hand, about 822 million people suffer from undernourishment. Since 1980 global obesity has become triple in 2023. It is estimated that by 2030, globally 1 in 5 women and 1 in 7 men will have obesity (WHO, 2014; Ibrahim et al., 2021). More than 4.72 million people are dying each year due to obesity, which is about 8% of global deaths; the highest death is in Egypt, and the lowest death is in Japan (Yilmaz, 2017; WHO, 2004). The morbidity and mortality due to obesity are increasing day by day worldwide. The WHO has estimated that 30% of death in the world will be due to obesity related diseases by 2030 (WHO, 2011). The excess medical costs due to obesity, such as ambulatory care, hospitalization, drugs, radiological or laboratory tests, and long-term care have increased (Wang et al., 2011).

The effective advice of health consciousness as a preventive measure for obesity "*eat less, move more*" has become ineffective due to social status and geographical location. Therefore, obesity is not a simple problem but a complex health matter (Williams et al., 2015). Obesity heavily depends on lifestyle factors, such as low rates of physical activity and chronic overeating, unhealthy societal eating habits, food deserts, and the disorder of the carbohydrate metabolism (Kahraman et al., 2015). Moreover, obesity is influenced by combination of individual factors, such as genetics, psychology, learned behaviors, societal and public policy (Kirk et al., 2012). Finally, we believe that detection and diagnosis of obesity as early as possible, which is crucial for the welfare of the individual and the society.

2. Literature Review

In any research, the literature review section is an introductory unit of research, where works of previous researchers are presented in brief (Polit & Hungler, 2013). Literature review helps the novice researchers to understand the subject, and it serves as an indicator of the subject that has been carried out before (Creswell, 2007). Mahmood Safaei and his coauthors have tried to find causes and consequences of obesity. They have also tried to mitigate threats of global obese people (Safaei et al., 2021).

Marianne A. B. van der Sande and her coworkers in their survey have found that individuals with a higher BMI and higher concentrations of glucose, cholesterol, triglycerides and uric acid, depend on their family history; and their risk of obesity and diabetes also depend on their family history (van der Sande et al., 2001). Fereshteh T. Yazdi and her coauthors have realized that precise etiology of obesity is required for the development of more successful and personalized prevention and treatment of obesity and diseases related to it (Yazdi et al., 2015). Haradhan Kumar Mohajan has analyzed a series of papers to discuss various communicable and non-communicable diseases (Islam et al., 2010; Mohajan, 2014, 2015, 2018a,b).

Susi Ari Kristina and her coauthors have shown that high prevalence of obesity can increase the burden from some non-communicable diseases, such as diabetes type 2, cardiovascular diseases, and cancers (Kristina et al., 2021). In a report, the Health Department of South Africa has that obesity is one of the major public health concerns that are facing South Africa, and its impact and cost extends to individuals, families, communities, the health service, and society as a whole. It has provided a long-term intention to prevent the spread of obesity related non-communicable diseases (Health Department of South Africa, 2015).

3. Research Methodology of the Study

The research design is the plan of the researchers to develop research area that is underpinned by philosophy, methodology and method (Tie et al., 2019). Methodology is the guideline to perform a good research, where

scientific methods are followed precisely and efficiently (Kothari, 2008). Therefore, research methodology is a strategy for planning, arranging, designing and conducting a fruitful research confidently to obtain a successful result (Legesse, 2014). Starting of the main research we have discussed Body Mass Index (BMI), then we successfully develop obesity, causes of obesity, and obesity related diseases. We have tried to highlight economic and health effects due to obesity, and finally we have discussed prevention and reduction policies of obesity.

Reliability and validity are two most important and fundamental features for the evaluation a research and throughout the study we have tried to maintain the reliability and validity as far as possible (Mohajan, 2017d). To prepare this article we have used secondary data sources that are collected from published and unpublished data sources, such as books and papers of famous authors (Mohajan, 2017).

4. Objective of the Study

The chief objective of this article is to discuss the aspects of obesity and its related diseases. At present obesity is widely recognized as one of the major health problems both for developed and developing countries. Obesity related non-communicable diseases (NCDs) have developed alarmingly that have threaten the global health system. Some other minor objectives of the study are as follows:

- to provide the causes of obesity,
- to show the economic and health consequences of obesity, and
- to highlight the prevention and reduction policies of obesity.

5. Body Mass Index (BMI)

The Body Mass Index (BMI) is defined as the body mass divided by the square of the body height, whose unit is kg/m^2; where height is measured in meters, and mass in kilograms (Taylor et al., 1998). It is the most useful population level measure of obesity that classify underweight, overweight, and obesity in individuals for maintaining a healthy life (Abarca-Gómez et al., 2017). The formula of BMI is as follows (WHO, 2004):

$$BMI = \frac{mass_{kg}}{height_m^2}. \tag{1}$$

BMI is an index to estimate obesity. It is a widely used method in the medical community to analyze potential health status (Bi & Samantaray, 2022). Belgian astronomer, mathematician, statistician, and sociologist, Adolphe Quetelet (1796-1874), has developed Body Mass Index (BMI), what he called "*social physics*" (Blackburn & Jacobs, 2014). The term "*Body Mass Index (BMI)*" is coined in 1972 by American physiologist Ancel Keys (1904-2004) and his coauthors (Keys et al., 1972). Major adult BMI classifications are underweight (BMI under 18.5), normal weight (BMI 18.5 to 24.9), overweight (BMI 25 to 29.9), and obese (BMI 30 or more) (Di Angelantonio & Bhupathiraju, 2016).

One problem on BMI is that it is not possible to distinguish between lean body mass (i.e., muscle) and body fat percentage (BFP) (Nuttall, 2015; Bajorek & Bevan, 2019). BMI overestimates body fat in persons who are very muscular and can underestimate body fat in persons who have lost muscle mass (Health Department of South Africa, 2015). In 1991, the BFP is estimated from the BMI by a formula derived by nutrition consultant of Singapore, Paul Deurenberg and his coworkers (Deurenberg et al., 1991). Appropriate BFP is necessary in human body to maintain life and reproductive functions. BFP indicates an overall body composition of a person (Gallagher et al., 2000). For example, subcutaneous fat in the hips may not be as serious a health risk as somebody with the same BMI but the fat located in the abdominal area or in liver that has serious effects (Nuttall, 2015). The formula of body fat percentage (BFP) is as follows (Deurenberg et al., 1991):

$$BFP = 1.2 \times BMI + 0.23 \times Age - 10.8 \times Gender - 5.4 \tag{2}$$

where *Gender* = '1' for men and '0' for women.

From equation (2) we see that *BFP* of women is about 11% higher than that for men due to demands of childbearing and other hormonal functions, but BMI displays same result both for men and women.

6. Overweighed and Obesity

If a human seems in risk to the health due to the presence of excessive fat in his/her body is considered as overweighed. If BMI of a person is in 25-29.9 then we call it overweight, and if it is more than 30 then it is considered as obese (Haslam & James, 2005). Obesity is a condition of abnormal or excess fat accumulation in adipose tissue, to the extent that health may be impaired (WHO, 2005). It is considered as a result of a complex combination of biological and psychological factors combined with environmental and social influences (Scott,

2019). In the society an individual may belong to any one of the 4 categories, such as underweight, normal, overweight, and obesity; based on their calculated BMI (Table 1) (WHO, 2020). Obesity is growing among industrial, developing and transition economies around the world. Concurrent morbidity associated to concurrent chronic disease has increased rapidly (Shetty & Schmidhuber, 2011).

At present there is no universally index for assessing obesity. Usually, it is measured by body mass index (BMI) (Ng et al., 2014). Other indices for measuring obesity and predicting obesity related health risks are waist-to-hip ratio (WHR), waist circumference (WC), and waist-to-height ratio (WHtR) (Vazquez et al., 2007). WHR is a good predictor of health risk, in which $WCR > 1.0$ in men and $WCR > 0.85$ in women indicates abdominal fat accumulation. But it is non-popular index due to measurement complication and some other reasons (Han et al., 1997). WC is a good index to measure health risk; where $WC > 94$ cm in men and $WC > 80$ cm in women measure risk associated with increased; and $WC > 102$ cm in men and $WC > 88$ cm in women associated with a substantially increased risk of obesity related metabolic complications (WHO, 2000; Wang, 2009). It is one of the most popular indices among common people in the world, since it is better associated with metabolic risk factors, but it has some problems depending on sex, age and race ethnicity (James, 2005). For example, amongst women, blacks are significantly more likely to be obese than whites. Hence, BMI and waist circumference are considered good estimates of our body fat and obesity (Health Department of South Africa, 2015).

The US CDC subdivides obesity based on BMI as; i) class I obesity; BMI 30 to 35 (low risk), ii) class II obesity; BMI 35 to 40 (moderate risk), and iii) class III obesity; BMI 40+ (high risk). The ranges of BMI values are given in Table 1 (WHO, 2016; Yarborough et al., 2018; CDC, 2021):

Table 1. The ranges of BMI values

Category	BMI (kg/m^2)
Underweight (Severe thinness)	< 16.0
Underweight (Moderate thinness)	16.0–16.9
Underweight (Mild thinness)	17.0–18.4
Normal range	18.5–24.9
Overweight (Pre-obese)	25.0–29.9
Moderately obese (Class I-low risk)	30.0–34.9
Severely obese (Class II-moderate risk)	35.0–39.9
Very severely obese (Class III-high risk)	≥ 40.0

Source: WHO, (2016).

Obesity is an "*acquired*" disease, which heavily depends on lifestyle factors, such as low rates of physical activity, frequent taking of fast foods, and chronic overeating (Safaei et al., 2021). It is due to the imbalance between the amount of calories are taken in and the calories are burnt, which would lead to excessive fat accumulation (Nammi et al., 2004). It is considered as a medical condition, and sometimes it is considered a disease that causes negative health effects (Powell-Wiley et al., 2021).

Obesity is a major cause of disability and various diseases, such as cardiovascular diseases, osteoarthritis, obstructive sleep apnea, hypertension, Alzheimer disease, asthma, metabolic syndrome, liver steatosis, gallbladder disease, hypercholesterolemia, metabolic syndrome, certain types of cancer, musculoskeletal disorders (joint and muscle pains), and type 2 diabetes (Chiolero, 2018). Usually, it develops in the transition from adolescent to youth, and continues in later years (Genc & Yigitbas, 2021). Therefore, obesity affects the morbidity and mortality of populations, and imposes huge health burdens on countries and regions (Shetty & Schmidhuber, 2011).

It also raises blood pressure, blood cholesterol, triglyceride levels, and lowers HDL cholesterol levels. Some researchers believe that it losses fertility in women, and creates fatty liver disease, and kidney disease (Pearson et al., 2021). It can affect nearly every organ system of human body, such as the cardiovascular system to the endocrine system, central nervous system, the gastrointestinal system, etc. (Lavie et al., 2014).

Obesity is a leading cause of death worldwide, but it is preventable. It is stigmatized in many countries of the world (Woodhouse, 2008). It is observed that both overweight and underweight people had a higher mortality rate than the people of normal weight (Whitlock et al., 2009). In 2016, about 1.9 billion adults were overweight, and more than 650 million were obese. From 1975 to 2016, the prevalence of obesity had increased by 3 folds

worldwide (WHO, 2020). Moreover, about 41 million children under-5 were overweight or obese (WHO, 2016). In 2013, about 23.8% of boys and 22.6% of girls in developed countries were considered overweight or obese, and the corresponding figures were 12.9% and 13.4% respectively, in developing countries (Ng et al., 2014).

7. Causes of Obesity

Our common sense of obesity is that more calorific intake due to chronic overeating and lower physical activity are the main cause of obesity. Some other common causes of obesity are automation, increasing incomes, urbanization, genetic predisposition, medications, mental disorders, economic policies, endocrine disorders, and exposure to endocrine disrupting chemicals (Bleich, et al., 2008; Yazdi, et al. 2015).

We cannot ignore that so called "*modern life*" has changed the human life, and consequently rises of obesity levels. But it is not a single cause of obesity in the society. Most of the researchers believe that some causes of obesity are social and economic. For example, obesity in European children is strongly associated with the socioeconomic status of their parents (WHO, 2014). Many recent reports have specified that the causes of obesity are more complex and a combination of multiple factors, such as genetic, social, and environmental influences (Foresight, 2011). Therefore, three main factors that develop obesity in human body are i) environmental and social factors, ii) genetic predisposition, and iii) disruption in energy balance (Yazdi et al., 2015).

In the 21st century, there has been a shift from a monogenetic approach toward seeing obesity as a multi-genetic disease (Lee, 2013). Family studies with twin and adopted children indicate a significant influence of genes on an individual's predisposition to develop obesity (Stunkard et al., 1986a, b). Fewer resources for recreation in the society, such as parks and playgrounds, rapid urbanization; use of vehicle for transport instead of walking, frequent use of fast foods, etc. are related to overweight and obesity (Booth et al., 2005). Economic development, industrialization and globalization are main causes of rapid urbanization that increase the availability of food, and change working patterns and lifestyles (Shetty & Schmidhuber, 2011). Population of the world in 2023 becomes more than 8 billion, and urban population becomes 4.5 billion in 2021, and it is expected that urban population will be 4.9 billion by 2030, and exceed 6.0 billion by 2050 (United Nations Population Division, 2023). Lifestyle changes contribute to a reduction in physical activity levels that results obesity (Popkin, 1994).

Some more mini reasons of obesity are as follows: either not getting enough sleep or getting too much sleep changes hormonal that increase appetite, which causes of obesity (Lombardo, 2016). Some medications, such as some antidepressants, anti-seizure medications, and diabetes medications can increase physical weight (Atlas et al., 2022). In human body, fat provides higher energy than protein and carbohydrate; and it has a higher capacity for storage in the body. So the individuals should take limited amount of fat in their daily foods. It is believed that education is related to obesity. For example, women with lower levels of education can be up to five times more likely to be obese than those with higher education. Family history of obesity, pregnancy, and advanced age are some causes of obesity (WHO, 2000; van der Sande et al., 2001).

8. Obesity Related Diseases

Global deaths due to non-communicable diseases (NCDs) have increased 77% between 1990 and 2020 that grows from 28.1 million to 49.7 million deaths annually (Kumanyika et al., 2013). It is estimated that in the 21st century obesity related mortality has increased. Obesity has also increased risk of some chronic diseases, such as diabetes, hypertension, cardiovascular disease, etc. (WHO, 2000; WCRF, 2007). In 2010, about 3.4 million deaths were happened due to obesity and overweight (Lim et al., 2012).

8.1 Diabetes and Obesity

Diabetes is a common disease among the obese adults than the non-obese adults. Type 2 diabetes is rising dramatically throughout the world is a common problem of adults whose $BMI \geq 35$, and it is about 20 times more likely to develop diabetes over a 10 year period than their peers with a normal BMI (Field et al., 2001; Krishnasamy & Abell, 2018). In 2017, about 462 million individuals were affected by type 2 diabetes globally, which corresponded to 6.28% of the world's population that results more than 1 million deaths. At present diabetes becomes the seventh leading disease in the world (Khan et al., 2020). Long-time and highly diabetes patients may attack by kidney failure, blindness, leg ulcers and congestive heart disease. Diabetes can be largely controllable if obesity can be controlled effectively (Yahr et al., 2023).

8.2 Cardiovascular Diseases and Obesity

Obesity influences individuals to a number of cardiovascular diseases (CVD), such as hypertension, dyslipidemia, and coronary heart disease (CHD) (Lavie et al., 2009). CHD susceptibility prevails 3-times in obese persons (5% deaths in men and 6% in women) than the non-obese (WHO, 2000). Obesity has a strong connection with insulin resistance and dyslipidemia. Dyslipidemia is characterized by an increase in levels triglycerides and low-density lipoprotein (LDL) cholesterol, and decreases high-density lipoprotein (HDL)

cholesterol (WHO, 2000; Shetty & Schmidhuber, 2011; Pearson et al., 2021). The obesity epidemic, poor diet, high blood pressure, a dramatic raise in type 2 diabetes etc., and these are all major risk factors for heart disease and stroke (Grant et al., 2018).

8.3 Obesity and Cancers

Many studies have explored mechanisms that are linked between obesity and cancer (Sheflin, 2014). Some 13 types of cancers, such as meningioma, multiple myeloma, adenocarcinoma of the esophagus, and cancers of the thyroid, postmenopausal breast, gallbladder, stomach, liver, pancreas, kidney, ovaries, uterus, colon and rectum (colorectal) develop rapidly in obese individuals than non-obese (CDC, 2017; Garvey & Mechanick, 2020).

The International Agency for Research on Cancer (IARC) Working Group shows that higher amounts of body fat are associated with an increased risk of a number of cancers (Lauby-Secretan et al., 2016). Obesity increases blood levels of insulin and insulin-like growth factor-1 (IGF-1) that may promote the development of colon, kidney, prostate, and endometrial cancers (Gallagher & LeRoith, 2015). In women, high BMI may create breast cancer among postmenopausal women and also may develop cancer in the endometrium through the production of excess amounts of estroge (World Cancer Research Fund, WCRF, 2007). Obese people often have chronic inflammatory conditions, such as gallstones or non-alcoholic fatty liver disease that leads to DNA damage and increases the risk of biliary tract (Roberts et al., 2010).

8.4 Obesity and Other Diseases

Osteoarthritis related to obesity can affect the weight-bearing joints, such as knees, spine, hips, and ankle due to extra pressure that affects movement in daily life (Lementowski & Zelicof, 2008). Obesity is often related with mental health problems. Emotional and psychological problems, such as lower self-esteem, anxiety, depression and suicide are seen extremely among the obese people than their counterparts, non-obese people. Stigma and discrimination could deepen obesity and induce mental health problems in obese individuals (Justyna et al., 2020). Some unhealthy coping mechanisms binge-eating and social isolation may develop among obese individuals (Dingemans et al., 2002). Certain diseases, such as Cushing syndrome, hypothyroidism, arthritis, Prader-Willi syndrome can cause weight gain (Kristina et al., 2021).

Sleep apnea, whose symptoms include daytime sleepiness, snoring at night, and instances where patients may "stop" breathing is caused due to obesity. Some temporary physical problems, such as fatigue and lack of energy, difficulty in sleeping, increase levels of cholesterol (triglycerides), high blood pressure, and depression are seen due to obesity (Grant et al., 2018). Polycystic ovary syndrome in women that causes irregular periods, excess androgen, polycystic ovaries, etc., endocrine disorder of reproduction that affects women of reproductive age are strongly related to obesity (Magnotti & Futterweit, 2007).

8.5 Obesity and COVID-19

During COVID-19 period risk of morbidity and mortality of obesity persons have increased. It is found that obese persons are infected and spread COVID-19 than those who have normal BMI (Mohajan, 2020a, 2021a; de la Rosa-Zamboni, D. et al., 2022). About 75.8% COVID-19 infected persons have been identified as obese, which is higher than the normal COVID-19 infected population (Gürbüz, 2020; Mohajan, 2020b, 2021b, 2022). According to WHO reports 13% of population is in obese category, while 39% is overweight (WHO, 2020; Mohajan & Mohajan, 2022).

9. Economic and Health Effects of Obesity

The rapid increase of obesity in the recent years has posed a serious health risk worldwide. Obese persons experience higher costs of healthcare and longer hospital stays to be cured. Every nation has taken various attempts to control this disease and to reduce its harmful effects, and also a lot of amount is spending every year for the treatment of obese individuals (Karamelikli & Gül, 2022). The global economic impact of obesity is estimated to be roughly $2 trillion, which is 2.8% of global GDP. Obesity is considered as the third global social burdens after the; i) smoking and armed violence, and ii) war and terrorism. It may reduce life expectancy where obesity is in alarming situation (McKinsey Global Institute, 2014).

Total population in the UK becomes 69 million in 2023; among them 68% of men and 60% of women are obese or overweight; while 29% of men and 27% of women are considered obese. In 2022, obesity related diseases cost the UK a massive £6.5 billion annually and this is set to rise to over £9.7 billion each year by 2050 (Bell, 2022). In 2016, about 100.3 million people in the USA were obese and another 80.2 million were overweight. On an average, annual medical expenses incurred for an obese American are $2,741 higher than those for an American of normal weight (Cawley & Meyerhoefer, 2012). In the USA total cost of chronic diseases due to obesity and overweight is $1.72 trillion, which is equivalent to 9.3% of the US GDP (Waters & Graf, 2020). In per capita terms, costs of obesity in 2019 ranged from $17 in India to $940 in Australia (Lee et al., 2018; Okunogbe et al., 2021).

Obesity presents a poorer quality of life, such as shortness of breath, back pain, psychological difficulties and reduced mobility. Obesity is responsible for about 6% of all global deaths (Kristina et al., 2021). It increases the risk of developing various non-communicable diseases. In women it may show reproductive problems, such as menstrual problems and infertility. During pregnancy obesity can create multiple problems (WHO, 2000, 2020). It is estimated that the increased body fatness and obesity have created an awful consequence due to urbanization, globalization, and the increased industrialization of the food supply (Kumanyika et al., 2013). A significant number of obese patients suffer depression, mental disorders, teasing and bullying, and social rejection that lead to a loss of self-esteem (Gariepy et al., 2010). Stigmatization, negative stereotyping, social marginalization, and discrimination may happen with obese people in many areas in the society, such as in education, healthcare, and employment (Beames et al., 2016).

10. Prevention and Reduction of Obesity

Obesity prevalence situation increases at an alarming rate in almost all regions of the world. Non-communicable diseases (NCDs) due to obesity have made a dreadful threat to human life. At present there is no effective, well-defined, evidence-based intervention to prevent obesity effectively. That is why obesity is increasing globally. Diet and exercise are preliminary ways of prevention of obesity (WHO, 2000).

Prevention, reduction, and control of obesity are necessary both for individuals and the society. Prevention strategy is the cost saving in the short-term that provides large economic and fiscal benefits in the long-term (WHO, 2020). But the prevention policy has a complex and multi-causal problems. To reduce obesity, we should encourage adoption of a healthy diet, and active on physical activity in families, education institutions, communities, etc. (Rosner, 2002). The lifestyle modification through behavioral change at the individual level can help in reduction of obesity (Tseng et al., 2018). Social networks, such as Facebook, YouTube, etc., computer-based work in offices, have reduced physical activity in the society. Limited use of these sites can reduce obesity (CDC, 2021).

A healthy and energy balanced diet makes the daily life of a person more enjoyable. Consumption of free sugars must be less than 10% of total energy consumption in a day. Every adult should take at least 150-300 minutes of moderate aerobic physical exercise/work, such as fast walking, water aerobics, tennis doubles, dancing, etc. or equivalently should take at least 75-150 minutes of vigorous aerobic physical exercise/work, such as running, swimming, fast cycling, jogging, soccer game, walking up the stairs, skipping, tennis singles, etc. per week (WHO, 2021). Practice of Mediterranean diet, such as whole grains, healthy fats and protein sources, fruits and vegetables, seafood, beans, nuts and healthy beverages can prevent obesity and obesity related diseases (Muscogiuri et al., 2022).

Reduction of the unhealthy foods, such as refined grains and sweets, potatoes, red meat, processed meat, sugary drinks, etc. from the daily routine food help in weight loss. Proper sleep arrangement, stress reduction, reduction of electronic devices usages and increase of physical activity can also reduce weight (Pearce et al., 2019). To prevent obesity, we need a complex method that interferes in societal, community, family, and individual levels. Greater weight loss of Class III obese can reduce blood pressure and improve blood cholesterol (Chiolero, 2018).

11. Conclusions

In this study aspects of overweight and obesity are investigated. Both of these significantly increase morbidity and mortality, and negatively impact on the overall quality of human life. Obesity and obesity related non-communicable diseases pose global health systems and economies to a grave threat. We have observed that overweight and obesity have been growing worldwide irrespective of sex, age, race, or socioeconomic status. Actually, healthy balanced diet is essential for the survival of a person with a good health; and an unbalanced food intake or binge-eating can cause harmful effects on human body, such as overweight, obesity, anorexia or bulimia. We have realized that prevention, treatment, and insurance of quality of life are necessary for those living with obesity. For the prevention, reduction, and combating of obesity epidemic more effective researches and efforts are needed.

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