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OBESITY BECOMES A GLOBAL PROBLEM

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Abstract

Obesity is a common disease that can cause and increase cardiovascular disease, diabetes, cancer, and more. This may indicate that obesity may affect genome stability. Obesity is a global problem, especially in high-income countries. The aim of this research is to identify diseases and cases associated with obesity. Methodology: The method used is a case study where the author analyzes an existing problem and arranges it systematically. Conclusion: Obesity is a disease that has a risk of causing the development of other diseases. Obesity has a major impact on physical and mental health. The factors that can cause obesity are genetics, environment, socio-economics and drugs.

Keywords:

Obesity, BMI, Fat, Overweight, Measurement

1. Introduction

Obesity is a disease that has a risk of causing other diseases. In fact, diseases related to obesity are the biggest challenges throughout the world. The risk factors for obesity are environment and genetics. In 1962, J. Neel theorizes the "frugal developing gene hypothesis" which partly explains the increase in obesity-related diseases worldwide.

Overweight or what is commonly known as obesity is a condition where a person experiences a buildup of fat so that they become overweight. Measuring obesity using BMI is a simple index commonly used to classify obesity. According to WHO, in 2021 as many as 340 million people aged 5-19 years will be obese. Over the past two decades, obesity data in America and Europe states that respectively 35% and 20% of the population suffer from obesity. Therefore, obesity is considered a global pandemic health problem. In 2018 in Indonesia, with a prevalence of people aged over 18 years who were obese, 26.60 men and 44.40 women were obese.

There are various factors behind the emergence of obesity, some of which include region and economic level, sociodemographic, behavioral and genetic factors which are still the most common causes of obesity.

There are various studies that have discussed obesity, but from various statements from experts it turns out that there are still several shortcomings, such as the lack of aggregate

and pure data regarding obesity. In general, obesity is always associated with various health problems such as smoking and heart attacks.

The aim of this research is to identify the magnitude of the problem, clinical symptoms, how to measure it, risk factors and the impacts caused by obesity. So researchers are interested in researching this topic.

2. Method

The method taken is a case study, where the author analyzes existing problems and then arranges them systematically.

3. Discussion

3.1. Definition of Obesity

Obesity is a condition where the fat in the body exceeds a predetermined threshold and can cause health problems. (Luli et al., 2023) Obesity is often characterized by being overweight. Measurement obesity can be measured using anthropometry which is usually called BMI. The formula is body weight (kg) divided by height (m^2) and waist circumference.(Harbuwono et al., 2018)

If the BMI category is between 25.0 and 29.9 kg/m^2, a person is included in the overweight or obese category.

Figure 1. Obesity divided into three categories, namely:

Obesity I: BMI 30 - < 35 kg/m^2.

Obesity II: BMI 35 - < 40 kg/m^2.

Obesity III: BMI 40 + kg/m^2, This is the most severe category of obesity. (Wharton et al., 2020)

Obesity and overweight are very different. However, both show similarities, namely excess fat in the body and are characterized by a higher body mass index (BMI).(Janssen et al., 2020) Obesity in children is the same as obesity in adults, which is determined by body mass index (BMI). Obesity in children is characterized by a BMI (Body Mass Index) value between the 95th percentile on the growth curve, according to age and gender.(Fitch & Bays, 2022)

Obesity itself can be caused by an imbalance in the body's control of incoming and outgoing energy, where the amount of energy coming in is more than the energy going out. (Aizawa & Helble, 1993)Apart from that, the causes of obesity are also very complex, they can

be influenced by environmental, genetic and ecological factors. In children, eating patterns that are not controlled by parents are often the cause of obesity at an early age.(Abarca-Gómez et al., 2017)

The impact of obesity is very large on physical and psychological health.(Pou et al., 2022a)Obesity is also often associated with several comorbid conditions or accompanying diseases such as hypertension, excess fat in the blood, diabetes, sleep disorders and depression. Obesity in children increases the risk(Blüher, 2020)

3.2. Big Problem

3.2.1. Person

In 2022, the European region will be at the stage of an overweight and obesity epidemic. Nearly 60% of adults and children are affected, 8% of children under 5 years of age and one in three school-aged children live with the disease.(Cobiac & Scarborough, 2021). The prevalence of obesity decreases at the age of 10 – 19 years, where one in four people live with overweight or obesity. Based on gender groups, the prevalence of women in the young age group tends to be lower than that of young men. (Upadhyay et al., 2018) This trend is inversely proportional to age prevalence, which shows that women are more at risk of obesity than men over the age of 45 years.(Hendarto, 2019)

3.2.2. Place

Obesity levels in various countries vary greatly, also influenced by the type of food consumed and lifestyles that limit the body's lack of movement. (Polyzos & Mantzoros, 2019), prevalence of obesity in developed countries, because countries with high incomes tend to consume high-calorie fast food more often.(World Health Organization. Regional Office for Europe, n.d.)

3.2.3. Time

The prevalence of obesity throughout the world almost tripled between 1975 and 2016. (Boutari & Mantzoros, 2022)The reason is that socio-economic status has changed drastically over time, as well as rapid population growth. (Sanyaolu et al., 2019)The World Obesity Federation predicts that in 2035 obesity cases will increase very high, where almost the world's population is obese, especially in England, causes are still the same, namely the socio-economic transition and population growth which will grow more rapidly. (Heindel et al., 2022)

4. Symptoms of Obesity

Obese people tend to experience more medical and health problems. Apart from that, it tends to also cause fat accumulation in the stomach.(Xu & Xue, 2016) Fat resistanceand hormones in the stomach cause metabolic dysfunctionlipids and carbohydrates, lipotoxicity, and apoptosis (cell deathprogrammed).(Gade et al., 2010)

Symptoms and risks of obesity include respiratory disorders such as sleep apnea and chronic obstructive pulmonary disease, certain types of cancer such as prostate, colon in men, breast and uterine cancer in women, coronary heart disease, diabetes (type 2 in children), depression, liver and gallbladder problems, gastro-esophageal reflux disease, high blood pressure, high cholesterol, stroke, and joint diseases such as osteoarthritis, pain in the knees and lower back. Obese people tend to have more health problems. Apart from that, sufferers also tend to accumulate fat in the stomach.(Xu & Xue, 2016)

5. Obesity Measurement

5.1. Body Mass Index (BMI)

Body Mass Index/BMI is defined as body weight (kg)/height squared (m2). Body weight is always related to height. Body Mass Index (BMI) which is defined as body weight (kg)/height squared (m2) is the most seriously used measure of body weight in relation to body height. (Sweeting, 2007). An indicator of obesity is accepted as a BMI of more than 30 kg/m2 (Değirmenci et al., 2015). Adult weight prediction is most accurate for BMI at age 18 with decreasing accuracy for BMI under 13(Deckelbaum & Williams, 2001)

BMI is used to measure fatness because muscle weighs more than fat, so a bodybuilder could have the same BMI as someone who is obese (*BY S U J ATA G U P TA*, n.d.). To measure body weight, wear light clothing and no shoes, empty the bladder, then use a digital scale with an accuracy of 100 g. Meanwhile, measuring body height is done without shoes, with a stadiometer to the nearest 0.5 cm. BMI is calculated by dividing body weight (kg) by height (m2). (Rahim Hingorjo et al., n.d.).

Figure 2: *Classification of BMI measurements*

Classification	BMI (Kg/m2)
Underweight	15-19.9
Normal weight	20-24.9
Overweight	25-29.9

Preobesity	
Class I obesity	30-34.9
Class II obesity	35-39.9
Class III obesity	>40

Source:(Nuttall, 2015)

Among adults, obesity is used according to international conventions to indicate a BMI <30 kg/m2 (or obesity grade 2), a BMI >25 kg/m2 indicates overweight or grade 1 (obesity), and a BMI 18.5–25 kg/ m2 is normal (World Health Organization, 1995) (Lean, 2000)

Although it is an index of obesity most commonly used in scientific publications and indexes choice by WHO. BMI also has the weakness of not being able to differentiate between fat and muscle mass, so there are risks tends to be too high in muscular athletes and too small in elderly people whose muscle mass is replaced by fat indifferent levels(Akpinar et al., 2007)

5.2. Waist size

A simple method for assessing abdominal obesity that is easy to apply clinically is waist circumference.(Ross et al., 2020). Waist circumference measurements were taken horizontally within a distance of 1 mm using a plastic measuring tape between the costal margin and the iliac crest in the midline of the axilla.
(Rahim Hingorjo et al., n.d.).

This measurement is carried out between the lower ribs and the iliac crest (Verweij et al., 2013). Waist circumference (WC) appears to be a better indicator than BMI for measuring central obesity. WC measurements are easy to perform, and correlate more strongly with intra-abdominal fat content and cardiovascular risk factors. The World Health Organization and the International Diabetes Federation (IDF) recommend measuring WC in the horizontal plane midway between the lowest rib and the iliac crest (WC-mid)(Ma et al., 2013)

WHO (World Health Organization) sets a healthy waist circumference limit in Asian countries, namely 90 cm for men and 80 cm for women.(Darsini et al., 2020)

6. Impact of Obesity

The following are several aspects of the impact of obesity, including:

I. Metabolic Impact

- Abdominal circumference of a certain size (men >90cm and women >80cm) will have an impact on increasing triglycerides and decreasing HDL cholesterol, as well as increasing blood pressure, this condition is called metabolic syndrome.(Alsulami S et al., 2019)

II. Impact of Other Diseases

- Asthma worsening(Hoey, 2014)
- Gallstone formation(Palacios et al., 2021)
- Sleep apnoea (stopping breathing while sleeping)(Rtveladze et al., 2014)
- Low back pain (low back pain)(Prado et al., 2016)
- Knee and hip osteoarthritis (mechanical related)(An et al., 2020)

III. Psychosocial Impact

- Obese children generally rarely play with their peers, tend to be alone, are not included in games and are awkward or withdraw from social contact (Heslehurst, 2011). This psychosocial problem is caused by internal factors, namely depression, lack of self-confidence, negative self-perception or low self-esteem because he is always the object of ridicule by his friends (Connaughton et al., 2016). External factors also have a big influence because from an early age the environment judges fat people as lazy, stupid and slow.(Medawar & Witte, 2022)

7. Obesity Risk Factors

The risk factors for obesity include:

7.1. Genetic Factors

The high rate of obesity in parents who have obese children is believed to be a fairly important factor. Research has shown that 60-70% of obese teenagers have one or both parents who are also obese (Thame et al., 2010). A genetic factor that is known to have a strong role is parental fatness. Obese children usually come from obese families. About 80% of children will be obese if their parents are also obese (Corona et al., 2017). If one parent is obese, the incidence will be 40%, and if both parents are not obese, the prevalence of obesity will decrease to 14%. The increased risk of becoming obese may be caused by the influence of genes or environmental factors in the family(Lee & Yoon, 2018)

7.2. Environmental factor

1. Dietary habit

a. Excessive energy intake causes overweight and obesity. Energy dense foods (high in fat, sugar, and low in fiber) cause energy imbalances

2. Physical Activity Patterns
   a. Sedentary physical activity patterns (lack of movement) cause the energy expended to be less than optimal, thereby increasing the risk of obesity.(De Vries Mecheva et al., 2023)

7.3. Socioeconomic Factors

The dominant economic factors in food consumption are family income and food prices. Increased income increases the ability to purchase food of better quality and quantity, otherwise income decreases.(Sybilski et al., 2015)

Families will experience a decline in food purchasing power both qualitatively and quantitatively. (Nurfatimah, 2014).

7.4. Drugs and Hormonal Factors

7.4.1. Medicines

Steroid medications, which are often used long-term to treat asthma, osteoarthritis, and allergies, can increase appetite and increase the risk of obesity. (Barzin et al., 2018)

Medicines that contain hormones to increase fertility and as a contraceptive have the risk of causing fat accumulation in the body which can lead to obesity.(Telleria-Aramburu & Arroyo-Izaga, 2022)

7.4.2. Hormonal

Hormones that play a role in obesity include the hormones leptin, ghrelin, thyroid, insulin and estrogen.(Pou et al., 2022b)

8. Conclusion

Obesity is a disease with a risk of causing other diseases. Obesity has a major impact on physical and mental health. There are many factors that can cause obesity, namely genetic factors, environmental factors, socio-economic factors, drug factors.

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