



Obesity: An Overview

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ABSTRACT

Obesity has reached epidemic proportions globally, it is the serious and growing public health problem which is not only restrained to developed countries but also in developing countries, Obesity is not receiving the attention they deserve from primary care practitioners. Obesity is a major contributor to the global burden of chronic disease and disability often co-existing in developing countries with under-nutrition. It is associated with serious medical, psychological, economical and social implications virtually affecting all age group. The global reason behind it is an energy imbalance between calories consumed and expended. In today's diet increased intake of energy dense foods that is rich in fat and sugars but low in vitamins, minerals and other micronutrients and a trend towards decreased physical activity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization.

Keywords: Obesity, chronic disease, treatment.

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INTRODUCTION

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health leading to reduced life expectancy and increased health problems. Obesity and overweight pose a major risk for serious diet-related chronic diseases, including type-2 diabetes, cardiovascular disease, hypertension and stroke, and certain forms of cancer. The health consequences range from increased risk of premature death, to serious chronic conditions that reduce the overall quality of life.

The prevalence of overweight and obesity is commonly assessed by using body mass index (BMI), defined as the weight in kilograms divided by the square of the height in meters (kg/m^2). A BMI over $25 \text{ kg}/\text{m}^2$ is defined as overweight, and a BMI of over $30 \text{ kg}/\text{m}^2$ as obese. These markers provide common benchmarks for assessment, but the risks of disease in all populations can increase progressively from lower BMI levels ^[1].

WHO's latest projection indicates that in 2015 approximately 2.3 billion adults will be overweight and more than 700 million will be obese. At least 20 million children under the age of 5 years are overweight globally^[2,]. Once considered a problem only in high-income countries, overweight and obesity are now dramatically on the rise in low- and middle-income countries, particularly in urban settings. A combination of excessive food energy intake and lack of physical activity is thought to most cases of obesity. A limited number of cases are due primarily to genetics, medical reasons, or psychiatric illness. In contrast increasing rates of obesity at a social level are felt to be due to easily accessible and palatable diet, increased reliance on cars and mechanized manufacturing ^[3].

The possible contribute to recent of obesity is due to Insufficient sleep, endocrine disrupters, decreased variability in ambient temperature, decreased rates of smoking because suppress appetite, increased use of medications that can cause weight gain, proportional increase in ethnic and age groups that tend to be heavier, pregnancy at a later age , epigenetic risk factors passed on generationally, natural selection for higher BMI and assortative mating leading to increased concentration of obesity risk factors while is substantial evidence supporting the influence of these of these mechanisms on the increased prevalence of obesity, the evidence is still inclusive and the authors state that these are probably less influential than the ones discussed. In most people obesity is caused by eating too much and moving too little^[4]. If you consume high amounts of energy from your diet but do not burn off the energy through exercise and physical activity, the surplus energy will be turned into fat.

Some factors we are discussed that causes obesity:-^[5]

Lifestyle choices

Obesity does not just happen overnight, it develops gradually from poor diet and lifestyle choices. For example, unhealthy food choices could be:

1. Eating processed or fast food high in fat.
2. Not eating fruit, vegetables and unrefined carbohydrates, such as whole meal bread and brown rice.
3. Drinking too much alcohol - alcohol contains a lot of calories, and heavy drinkers are often overweight.
4. Eating out a lot – may have a starter or dessert in a restaurant and the food can be higher in fat and sugar.

Childhood obesity can be a strong indicator of weight-related health problems in later life, showing that learned unhealthy lifestyle choices continue into adulthood.

Lack of exercise and physical activity

Lack of exercise and physical activity is another important factor related to obesity. Many people have jobs that involve sitting at a desk most of the day. They also rely on their cars rather than walking, or cycling. When they relax, people tend to watch TV, browse the internet or play computer games, and rarely take regular exercise.

Australian adults are recommended to do at least 30 minutes of moderate-intensity activity (for example, cycling or fast walking) on most days of the week. This will help you maintain a healthy weight. However, if overweight or obese and trying to lose weight, it may need to do more exercise – in some cases up to an hour on most days of the week may be recommended.

Genetics

Some people claim there is no point in losing weight because 'it runs in my family' or 'it is in my genes. While there are some rare genetic conditions that can cause obesity, such as Prader-Willi syndrome, there is no reason why most people cannot lose weight. It may be true that certain genetic traits inherited from parents, such as taking longer to burn up kilojoules (having a slow metabolism) or having a large appetite, can make losing weight more difficult. However, it certainly does not make it impossible. Many cases where obesity runs in families may be due to environmental factors such as poor eating habits learned during childhood. Although there are genetic and hormonal influences on body weight, obesity occurs when men take in more calories than he burn through exercise and normal daily activities. Their body stores these excess calories as fat. Obesity usually results from a combination of causes and contributing factors, including:

1. Inactivity- If the person is not very active; they don't burn as many calories. With a sedentary lifestyle, they can easily take in more calories every day than they use through exercise and normal daily activities.
2. Unhealthy diet and eating habits- Having a diet that's high in calories, eating fast food, skipping breakfast, eating most of their calories at night, drinking high-calorie beverages and eating oversized portions all contribute to weight gain.
3. Pregnancy- During pregnancy, a woman's weight necessarily increases. Some women find this weight difficult to lose after the baby is born. This weight gain may contribute to the development of obesity in women.
4. Lack of sleep- Getting less than seven hours of sleep a night can cause changes in hormones that increase your appetite. Person may also crave foods high in calories and carbohydrates, which can contribute to weight gain.
5. Certain medications--Some medications can lead to weight gain if person don't compensate through diet or activity. These medications include some antidepressants, anti-seizure medications, diabetes medications, antipsychotic medications, steroids and beta blockers.
6. Medical problems- Obesity can sometimes be traced to a medical cause, such as Prader-Willi syndrome, Cushing's syndrome, polycystic ovary syndrome, and other diseases and conditions. Some medical problems, such as arthritis, can lead to decreased activity, which may result in weight gain. A low metabolism is unlikely to cause obesity, as is having low thyroid function.

SYMPTOMS

Being a little overweight may not cause many noticeable problems. However, once you are carrying a few extra kilograms (or pounds), may develop symptoms that affect daily life.

Health problems

Obesity can cause day-to-day health problems such as:

1. Breathlessness
2. Increased sweating
3. Snoring
4. Difficulty sleeping
5. Inability to cope with sudden physical activity
6. Feeling very tired every day
7. Back and joint pains.

Obesity can also causes changes may not notice, but that can seriously harm health, such as high blood pressure (hypertension) and high cholesterol levels (fatty deposits blocking the arteries). Both conditions significantly increase the risk of developing a cardiovascular disease.

Another long-term problem that can affect obese people is type 2 diabetes. It is estimated that just under half of all cases of diabetes are linked to obesity. The main symptoms of diabetes are:

- a) Feeling very thirsty.
- b) Going to the toilet a lot, especially at night.
- c) Extreme tiredness.

Psychological problems

In addition to the day-to-day health problems, many people may also experience psychological problems such as:

- a) Low self-esteem
- b) Low confidence levels
- c) Feeling isolated in society.

EFFECT ON HEALTH

Excessive body weight is associated with various disease, particularly cardiovascular diseases, diabetes mellitus, type 2 obstructive sleep apnea, certain types of cancer, osteoarthritis and asthma as a result obesity has been found to reduce life expectancy. Obesity is one of the leading preventable causes of death worldwide.

MORBIDITY

Obesity associated morbidity - obesity increases the risk of many physical and mental conditions. These co morbidities are most commonly shown in metabolic syndrome a combination of medical disorders which includes diabetes mellitus type 2, high blood pressure, high blood cholesterol, and triglyceride levels.

Complications are either directly caused by obesity or indirectly related through mechanisms sharing a common cause such as a poor diet or a secondary lifestyle. The strength of the link between obesity and specific conditions varies. One of the strong is the link with type 2 diabetes. Excess body fat underlies 64% of cases of diabetes in men and 77% of cases in woman.

Health consequences fall into two broad categories: those attributable to the effects of increased fat mass and those due to the increased no of fat cells. Increase in body fat alters the body's response to insulin, potentially leading to insulin resistance.

Obese peoples undergoing hem dialysis, and has subsequently been found in those with heart failure and peripheral artery disease.

MANAGEMENT OF OBESITY

The main treatment for obesity consists of dieting and physical exercise. Diet programs may produce weight loss over the short term, but maintaining this weight loss is frequently difficult and often requires making exercise and a lower calorie diet a permanent part of a person's lifestyle. Success rates of long-term weight loss maintenance with lifestyle changes are low ranging from 2 to 20%. Dietary and lifestyle changes are effective in limiting excessive weight gain in pregnancy and improve outcomes for both the mother and the child.

The most effective treatment for obesity is bariatric surgery. Surgery for severe obesity is associated with long-term weight loss and decreased overall mortality. One study found a weight loss of between 14% and 25% (depending on the type of procedure performed) at 10 years, and a 29% reduction in all cause mortality when compared to standard weight loss measures. However, due to its cost and the risk of complications, researchers are searching for other effective yet less invasive treatments. Studies have found significant benefits in mortality in certain populations from weight loss. In a prospective study of obese women with weight related diseases, intentional weight loss of any amount was associated with a 20% reduction in mortality. In obese women without obesity related illnesses a weight loss of greater than 9 kg (20 lb) was associated with a 25% reduction in mortality. A 2007 review concluded that certain subgroups such as those with type 2 diabetes and women show long term benefits in all cause mortality, while outcomes for men do not seem to be improved with weight loss. A subsequent study has found benefits in mortality from intentional weight loss in those who have severe obesity.

DIET

Diets to promote weight loss are generally divided into four categories: low-fat, low-carbohydrate, low-calorie, and very low calorie. A meta-analysis of six randomized controlled trials found no difference between three of the main diet types (low calorie, low carbohydrate, and low fat), with a 2–4 kilogram weight loss in all studies. At two years these three methods resulted in similar weight loss irrespective of the macronutrients emphasized.

Very low calorie diets provide 200–800 kcal/day, maintaining protein intake but limiting calories from both fat and carbohydrates. They subject the body to starvation and produce an average weekly weight loss of 1.5–2.5 kilograms. These diets are not recommended for general use as they are associated with adverse side effects such as loss of lean muscle mass, increased risks of gout, and electrolyte imbalances. People attempting these diets must be monitored closely by a physician to prevent complications.

EXERCISE

With use muscles consume energy derived from both fat and glycogen. Due to the large size of leg muscles, walking, running, and cycling are the most effective means of exercise to reduce body fat. Exercise affects macronutrient balance. During moderate exercise, equivalent to a brisk walk, there is a shift to greater use of fat as a fuel. To maintain health the American Heart Association recommends a minimum of 30 minutes of moderate exercise at least 5 days a week

Weight loss programs

Weight loss programs often promote lifestyle changes and diet modification. This may involve eating smaller meals, cutting down on certain types of food, and making a conscious effort to exercise more. These programs also enable people to connect with a group of others who are attempting to lose weight, in the hopes that participants will form mutually motivating and encouraging relationships. In a structured setting, 67% of people who lost greater than 10% of their body mass maintained or continued to lose weight one year later. An average maintained weight loss of more than 3 kg or 3% of total body mass could be sustained for five years.

SURGERY

Bariatric surgery is the use of surgical intervention in the treatment of obesity. As every operation may have complications surgery is only recommended for severely obese people (BMI > 40) who have failed to lose weight following dietary modification and pharmacological treatment. Weight loss surgery relies on various principles: the two most common approaches are reducing the volume of the stomach which produces an earlier sense of satiation, and reducing the length of bowel that comes into contact with food (gastric bypass surgery) which directly reduces absorption. Band surgery is reversible, while bowel shortening operations are not. Some procedures can be performed laparoscopically. Complications from weight loss surgery are frequent.

Surgery for severe obesity is associated with long-term weight loss and decreased overall mortality. One study found a weight loss of between 14% and 25% (depending on the type of procedure performed) at 10 years, and a 29% reduction in all cause mortality when compared to standard weight loss measures. A marked decrease in the risk of diabetes mellitus, cardiovascular disease and cancer has also been found after bariatric surgery. Marked weight loss occurs during the first few months after surgery, and the loss is sustained in the long term. In one study there was an unexplained increase in deaths from accidents and suicide, but this did not outweigh the benefit in terms of disease prevention. When the two main techniques are compared, gastric bypass procedures are found to lead to 30% more weight loss than banding procedures one year after surgery.

Ileocecal bypass, in which the digestive tract is rerouted to bypass the small intestine, was an experimental surgery designed as a remedy for morbid obesity.

The effects of liposuction on obesity are less well determined. Some small studies show benefits¹ while others show none. A treatment involving the placement of an intragastric balloon via gastroscopy has shown promise. One type of balloon led to a weight loss of 5.7 BMI units over 6 months or 14.7 kg. Regaining lost weight is common after removal, however, and 4.2% of people were intolerant of the device.

TREATMENT

Successful weight-loss treatments include setting goals and making lifestyle changes, such as eating fewer calories and being physically active. Medicines and weight-loss surgery also are options for some people if lifestyle changes aren't enough.

FOR ADULTS

- a) Try to lose 5 to 10 percent of current weight over 6 months. This will lower persons risk for coronary heart disease (CHD) and other conditions.
- b) The best way to lose weight is slowly. A weight loss of 1 to 2 pounds a week is do-able, safe, and will help person keep off the weight. It also will give person the time to make new, healthy lifestyle changes.

LIFESTYLE CHANGES

Lifestyle changes can help person to achieve long-term weight-loss success. Example of lifestyle changes include:

1. Focusing on balancing energy IN (calories from food and drinks) with energy OUT (physical activity)
2. Following a healthy eating plan
3. Learning how to adopt healthy lifestyle habits

Over time, these changes will become part of person's everyday life.

CALORIES

Cutting back on calories (energy IN) will help to lose weight. To lose 1 to 2 pounds a week, adults should cut back their calorie intake by 500 to 1,000 calories a day. In general, having 1,000 to 1,200 calories a day will help most women lose weight safely. In general, having 1,200 to 1,600 calories a day will help most men lose weight safely. This calorie range also is suitable for women who weigh 165 pounds or more or who exercise routinely. For overweight children and teens, it's important to slow the rate of weight gain.

Healthy Eating Plan

A healthy eating plan gives the body the nutrients it needs every day. It has enough calories for good health.

A healthy eating plan is low in saturated fat, Trans fat, cholesterol, sodium (salt), and added sugar. Following a healthy eating plan will lower the risk for heart disease and other conditions.

Healthy foods include:

1. Fat-free and low-fat dairy products, such as low-fat yogurt, cheese, and milk.
2. Protein foods, such as lean meat, fish, poultry without skin, beans, and peas.
3. Whole-grain foods, such as whole-wheat bread, oatmeal, and brown rice. Other grain foods include pasta, cereal, bagels, bread, tortillas, couscous, and crackers.
4. Fruits, which can be fresh, canned, frozen, or dried.
5. Vegetables, which can be fresh, canned (without salt), frozen, or dried.

Foods to limit

Foods that are high in saturated fats and cholesterol raise blood cholesterol levels and also might be high in calories. Fats and cholesterol raise the risk for heart disease, so they should be limited.

Saturated fat is found mainly in:

1. Fatty cuts of meat, such as ground beef, sausage, and processed meats (for example, bologna, hot dogs, and deli meats)
2. Poultry with the skin
3. High-fat dairy products like whole-milk cheeses, whole milk, cream, butter, and ice cream
4. Lard, coconut, and palm oils, which are found in many processed foods

Cholesterol mainly is found in:

1. Egg yolks
2. Organ meats, such as liver
3. Shrimp
4. Whole milk or whole-milk products, such as butter, cream, and cheese

Limiting foods and drinks with added sugars, like high-fructose corn syrup, is important. Added sugars will give extra calories without nutrients like vitamins and minerals. Added sugars are found in many desserts, canned fruit packed in syrup, fruit drinks, and no diet drinks. Check the list of ingredients on food packages for added sugars like high-fructose corn syrup. Drinks that contain alcohol also will add calories, so it's a good idea to limit your alcohol intake.

Portion size - A portion is the amount of food that we choose to eat for a meal or snack. It's different from a serving, which is a measured amount of food and is noted on the Nutrition Facts label on food packages.

Anyone who has eaten out lately is likely to notice how big the portions are. In fact, over the past 40 years, portion sizes have grown significantly. These growing portion sizes have changed what we think of as a normal portion.

Food weight-- Studies have shown that we all tend to eat a constant "weight" of food. Ounce for ounce, our food intake is fairly consistent. Knowing this, person can lose weight if they eat foods that are lower in calories and fat for a given amount of food.

For example, replacing a full-fat food product that weighs 2 ounces with a low-fat product that weighs the same helps to cut back on calories. Another helpful practice is to eat foods that contain a lot of water, such as vegetables, fruits, and soups.

PHYSICAL ACTIVITY

Being physically active and eating fewer calories will help the person lose weight and keep weight off over time. Physical activity also will benefit in other ways. It will:

1. Lower the risk for heart disease, , diabetes, and cancers (such as breast, uterine, and colon cancers)
2. Strengthen heart and help lungs work better.
3. Strengthen muscles and keep joints in good condition.
4. Slow bone loss.
5. Give more energy.
6. Help relax and better cope with stress.
7. Allow to fall asleep more quickly and sleep more soundly.

The four main types of physical activity are aerobic, muscle-strengthening, bone strengthening, and stretching.

People vary in the amount of physical activity they need to control their weight. Many people can maintain their weight by doing 150 to 300 minutes of moderate-intensity activity per week, such as brisk walking.

People who want to lose a large amount of weight (more than 5 percent of their body weight) may need to do more than 300 minutes of moderate-intensity activity per week.

Children should get at least 60 minutes or more of physical activity every day. Most physical activity should be moderate-intensity aerobic activity. Activity should vary and be a good fit for the child's age and physical development.

Many people lead inactive lives and might not be motivated to do more physical activity. To lose weight and gain better health, it's important to get moderate-intensity physical activity.

BEHAVIORAL CHANGES

Changing person's behaviors or habits related to food and physical activity is important for losing weight. The first step is to understand which habits lead that to overeat or have an inactive lifestyle. The next step is to change these habits.

WEIGHT-LOSS MEDICINES^[6-11]

Weight-loss medicines approved by the Food and Drug Administration (FDA) might be an option for some people that include diet, physical activity, and behavioral changes.

Weight-loss medicines might be suitable for adults who are obese (a BMI of 30 or greater). People who have BMIs of 27 or greater, and who are at risk for heart disease and other health conditions, also may benefit from weight-loss medicines. Small intestine was an experimental surgery designed as a remedy for morbid obesity.

ANTIOBESITY MEDICATION

Antiobesity medication or weight loss drugs are all pharmacological agents that reduce or control weight. These drugs alter one of the fundamental processes of human body, weight regulation by either altering appetite or absorption of calories.

Antiobesity drugs acts either by altering the appetite, metabolism, absorption calories. Only one antiobesity medications orlistat is currently approved by FDA for long term use. It reduces intestinal fat absorption by inhibiting pancreatic lipase. It has been also developed from the knowledge that cannabis smokers often experience hunger which are often to as the "the munchies". Sibutramine which acts in the brain to inhibit deactivation of the neurotransmitters there by decreasing the appetite was withdrawn from USA and Cannabis market due to cardiovascular concern because of potential side effects it is recommended that antiobesity drug only be prescribed for obesity where it is hoped that the benefit of treatment outweighs its risks.

CLASSIFICATION OF ANTIOBESITY DRUGS-

1. Centrally Acting Drugs
 - a) Stimulants – phentermine, sibutramine.
 - b) Cannabinoids – surinabant, rosanabant.
 - c) Other- metformine, lorcaserin.
2. Peripherally Acting Drugs- orlistat, cetilistat.

CENTRALLY ACTING DRUGS

They modulate brain area associated with satiety hedonic and motivational eating behavior and area associated with emotions. These drugs are mainly used produce anorexia.

Peripherally Acting Drugs- It inhibits the gastric and pancreatic lipase thereby decreasing the ingested triglyceride hydrolysis. It produces the dose dependent reduction in dietary fat absorption thereby leading to weight in obese patient.

ORLISTAT (XENICAL)

Orlistat (also known as tetrahydrolipstatin) is a drug designed to treat obesity. It is marketed as a prescription drug under the trade name Xenical by Roche in most countries, and is sold over-the-counter as Allis by GlaxoSmithKline in the United Kingdom and the United States. Its primary function is preventing the absorption of fats from the human diet by acting as a lipase inhibitor, thereby reducing caloric intake. It is intended for use in conjunction with a healthcare provider-supervised reduced-calorie diet.

Orlistat is the saturated derivative of lipstatin, a potent natural inhibitor of pancreatic lipases isolated from the bacterium *Streptomyces toxytricini*. However, due to its relative simplicity and stability, Orlistat was chosen over lipstatin for development as an anti-obesity drug.

The effectiveness of Orlistat in promoting weight loss is definite, though modest. Pooled data from clinical trials suggest that people given Orlistat in addition to lifestyle modifications, such as diet and exercise, lose about 2–3 kilograms (4.4–6.6 lb) more than those not taking the drug over the course of a year. Orlistat also modestly reduces blood pressure, and appears to prevent the onset of type 2 diabetes, whether due to weight loss itself or to other effects; in a large randomized controlled trial, Orlistat was found to reduce the incidence of diabetes by nearly 40% in obese people.

Orlistat is notorious for its gastrointestinal side effects (sometimes referred to as treatment effects), which can include steatorrhea (oily, loose stools). These decrease with time, however, and are the most frequently reported adverse effects of the drug.^[9] In the United States, the European Union, and Australia, Orlistat is available for sale without a prescription. Over-the-counter approval was controversial in the United States, with consumer advocacy group Public Citizen repeatedly opposing it on safety and efficacy grounds.^[10,11] Generic formulations of Orlistat are available in some countries. At times, such as in spring 2012, Orlistat has come into short supply, with consequent price increases because of no availability of one of the drug's components.

Metreleptin – It is appetite suppressant. It is indicator of energy balance. Acute change in the energy related to appetite. It regulates the energy intake.

Lorcaserin – in 2012, FDA officially approved lorcaserin for use in treatment of obesity for adults with BMI with or equal to 30 kg/m² who have at least one weight related health condition such as high blood pressure.

Bupropion – it gives the same action as that of Orlistat and sibutramine with 400 mg/day for treating obesity. Period is 6 – 12 months.

Zonisamide – three ongoing clinical trials for weight loss indication it is mostly given with the combination with bupropion.

Topiramate – it is combined drug which is under peripherally acting phenteramine called Qsymia for obesity.

Alternative Medication

Product	Claim
Green tea extract	Decreases appetite, Increases metabolism, Fat cell death
Lipoic acid	Increases glucose absorption in muscles rather than fat
Raspberry ketone	Increases norepinephrine-induced lipolysis

CONCLUSION

Orlistat is a novel antiobesity agent, which selectively and potently inhibits the absorption and hydrolysis of fat that result in 30% decrease in fat. It had withdrawn the attention of media and researcher during the last three years due to its pharmaco economic merit. From the above overview Orlistat seems to be safe and promising drug. Its adverse effect and drug-drug interactions seem to be affordable. No reports on over dose and only one case-report were found on the abuse of orlistat with abnormal subject. Obesity itself is very serious condition and becoming one of the leading causes of death worldwide, also increases the risk of many physical and mental condition. But , it can be easily prevented by better dietary habit, physical exercise and correct medications. So , special attention should be given to it because “Prevention is better than cure”.

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