



Different Perspectives for the Management of Obesity

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Abstract

Today, socio-demographic and lifestyle variables have more influence on body mass and composition. A discrepancy between the energy consumed through food and the energy consumed expended through physical exercise leads to obesity. It affects around 135 million people in India and the United States, including 39.8% of adults and 18.5% of kids. Obesity exacerbates hundreds of new severe problems, most of which are incurable. The BMI and other measurements may be used to test for obesity. Obesity is treated with a mix of medications. Multiple clinical trials have shown that several medications are utilized to treat obesity in conjunction with lifestyle, nutritional, and behavioral changes. Orlistat has been determined to be the most preferred therapy for obesity. Under severe situations, many surgical procedures might be done on the patient to decrease morbidity. This study examines pharmacological and non-pharmacological approaches to obesity management since obesity is a worldwide problem due to its association with several health crises and its predicted growth in the future, particularly among rural and elderly populations. Even though recent studies have firmly demonstrated that obesity increases the chance of COVID-19 death by increasing oxygen use and ventilator use. it serves as a wake-up call for the introduction of a new campaign. Therefore, the government, healthcare professionals, and researchers must act immediately to control and cure overweight and obesity.

Keywords; Obese and overweight, behavior management, body mass, health, nutrition

Introduction

An increasing number of individuals are overweight or obese, which poses a danger to their health and raises the likelihood of them being sick and the expense of providing medical treatment for them. Obesity is a widespread nutritional problem defined by excessive fat storage in the body¹. It's on the rise all around the world. Hypertension, dyslipidemia, type 2 diabetes, cardiovascular disease, sleep apnea, symptomatic heartburn, fatty liver, gall stones, abdominal wall hernias, post-operative problems, osteoarthritis, depression, and psychosis are just some of the conditions it worsens². According to surveys conducted between 2003 and 2004, over 4.8% of Americans, or almost two-thirds of the adult population, suffered from an obesity. After the United States and China, India is now home to 15% of the world's obese population, putting it in the third position. Obesity is prominent in the US at 35% of the population, whereas the figure for south India is 46% (women, 47%; males, 43%). Women are more likely than males to have abdominal obesity (47%-51% vs. 35% for both sexes), putting them at an increased likelihood of developing heart diseases and type-2 diabetes (Clinical Problems Caused by Obesity - PubMed, no date). Obesity is now the only or primary cause of aggravating one or more preexisting medical conditions such as type II diabetes, heart disease, and many cancers. Obesity is associated with the development of insulin resistance and type 2 diabetes mellitus, both of which make it difficult to keep blood sugar levels stable over the long term³. More than 90% of those with type 2 diabetes are overweight, and several studies have shown that a difference of only 5 kg in weight makes a significant difference in the chance of developing the disease. Therefore, those with a Body Mass Index (BMI) of 40 kg/m² or more are at risk of developing type 2 diabetes⁴. Several surgical procedures, non-pharmacological methods, and pharmaceutical approaches have been employed to manage obesity⁵. Positive effects on fasting blood sugar, hemoglobin A1c, and lipid profiles, as well as better weight reduction, have been seen after bariatric surgery⁶. Hypertension, type 2 diabetes, cardiovascular disease, abnormal lipid profiles (dyslipidemia), high blood pressure, stroke, osteoarthritis, gall bladder disease, and various types of cancer are only some of the health problems linked to obesity. hence, it has been shown that being overweight raises the probability of being sick⁷.

It wasn't until 1997 that the World Health Organization (WHO) issued its guidelines for categorizing individuals based on their weight (Obesity and overweight, no date). Limits on

body mass index have been recommended for this grouping. If your body mass index is below 18.5kg/m², then you have a low BMI; if it's over 40.0, then you have a high BMI (stage III obesity). Information regarding rising levels of body fat, comparisons of weight status between and within populations, and information about populations at increased risk of disease and death are all supplied by the Body Mass Index (BMI) Obesity classification⁸ in Table 1.

ASSESSMENT OF OBESITY

The Body-Mass Index is a good starting point for overweight screening. It serves just as a proxy for the danger posed to one's health. The World Health Organization has established definitions of overweight and obesity for people of both sexes. A classification scheme was devised by the World Health Organization in 1997, which is reflected in tables 1 and 2. Body mass index (BMI) is calculated by dividing one's kilogram weight by one's square meter height⁹. Physicians should additionally consider another factor recommended by the National Heart, Lung, and Blood Institute¹⁰ [NHLBI]. Measured in centimeters at the midpoint between the lower rib border and the upper border of the pelvis, the waist circumference is another way to evaluate obesity¹¹. This metric is useful for gauging upper-body fat distribution but does not give reliable estimates of intra-abdominal visceral fat. Type-2 diabetes, cardiovascular disease, dyslipidemia, and hypertension all include abdominal obesity as a risk factor¹². A higher incidence of a variety of illnesses, such as cardiac diseases has been linked to a larger waist circumference. Patients with a body mass index (BMI) of 25 or higher with a waist circumference of 35 inches or more (in women) or 40 inches (in males) are at a higher risk of developing hypertension, dyslipidemia, insulin resistance, and type 2 diabetes¹³. High morbid obesity is diagnosed when three or more risk factors are present. Skin fold thickness is another method of evaluation; it is the measurement of skin fold thickness in centimeters using callipers, and it provides an accurate assessment if performed at numerous places, but it does not provide information regarding abdominal and intra-muscle fat¹⁴. Because fat is mostly an electrolyte solution, another measurement used is bioimpedance, which states that lean mass conducts current more effectively than fat mass. It was also capable of gauging the impedance (or resistance) to a low-current flow¹⁵ used from head to toe to calculate an approximation of body fat through an experimentally determined equation. However, bioimpedance has never assessed fats and cannot predict biological consequences, although its measuring technique is highly easy and practical¹⁶.

Table 1 BMI-based categories for obesity WHO1997¹⁷

Classification	Body-Mass Index	Obesity stage	Synopsis of people's wellness
Underweight	<18.5kg/ m ²	–	Thin
Normal	18.5-24kg/m ²	–	Healthy/ Normal
Overweight	25-29.9 kg/m ²	–	overweight
Obesity	30- 34.9kg/m ²	I	obesity
	35-39.9kg/m ²	II	obesity
Extremely obesity	≥40.0kg/m ²	III	Morbid obesity

Table 2 Categorization of obesity based on the risk of related diseases and waist circumference adopted from WHO's 1997 report on prevention and control of the global obesity pandemic¹⁸

Classification	Stage of obesity	Illness threat based on the measurement of the waist	
		Men less than 40 Women less than 35	Men less than 40 and women less than 35
Underweight	-	-	-
Normal	-	-	-
Overweight	-	increases	High
Obesity	I	High	Quite high
	II	Quite high	Quite high
Extremely obesity	III	Highly elevated	Highly elevated

Epidemiology of obesity

Even from yesterday, the situation is considerably different today. In recent decades, overweight and disorders associated with excess weight have almost doubled in occurrence. The WHO reports that the incidence of overweight and obesity among youngsters ages 5 increased by 47.1% between 1980 and 2013, and this trend persisted into 2014. From 2011-

2014, 17% of American youngsters between the ages of 2 and 19 were overweight, according to a nationwide survey. However, 5.8% of the population was considered to be very obese. The prevalence of obesity in the United States in 2015-2016 was 18.5% among adolescents and 39.8% among adults, respectively, according to data from the National Center for Health Statistics¹⁹. Obesity rates in males aged 40–59 are 40.8 percent, in men aged 20–29.9 percent, and in women aged 40–59, 44.7 percent and 36.5 percent, respectively; the corresponding figures for women aged 20–39 age ranges between 36.5 and 40.8 percent. This evidence shows that obesity disproportionately affects women²⁰. Among American kids, 18.5% are obese, with the rate among adolescents being 20.6%, according to the majority of recent research. Children between the ages of 6 and 11 were more likely to be obese (18.4%) than those between 11 and 18 (13.9%) who were not yet in school. Teenage boys (20.4%) are affected more than young boys (14.3%). Similar cases were discovered in females. Teenage girls (20.9%) had a higher likelihood of being overweight than younger ones (13.5%). The prevalence of obesity among children and young adults range from 13.9% in 1999–2000 to 18.5% in 2015–2016²¹. The National Health and Nutrition Examination Program in the U. S. measures and classifies obesity rates according to body-mass index have been steadily rising among both children and adults. In the 2015-2016 academic year, about 35.8% of adults and 18.5% of kids were obese. Trends in obesity have resulted in a doubling of the global prevalence of overweight and obesity from 1980 to 2014 when 1.9 billion people were overweight and 600 million were obese²².

From 1980 to 2014, the prevalence of obesity among adults worldwide who are 18 or older grew by around 11% in men and 15% in women. More than 41 million children under the age of 5 were overweight in 2013²³. Obesity and overweight have been on the rise in India over the last decade, as seen by a rise in the country's average body mass index (BMI) from 20.3 to 21.9 between 1998 and 2016. Women between the ages of 30 and 39, as well as those between 40 and 49, have shown rises in their average body mass index. Muslim women were more likely than Hindu women to be overweight (National Family Health Survey, no date). Studies have also shown that women from scheduled castes are disproportionately impacted by weight issues. In 2015–2016, schedule caste women were found to have a body-mass index of 21.8 kg/m² on average, which is a considerable increase from the previous study period when BMI on average was 20.1 kg/m². On the other hand, the average body mass index of women in the highest income quintiles shifted significantly between 2015 and 2016. From 1998–1999 to 2009–2010, the prevalence of obesity among American women

increased by 50%, although this increase was concentrated among those who were already overweight (2015-2016). There has been a steady rise in obesity rates over the last two decades, with 20% of women considered obese in 2015–2016 compared to just 10.6% in 1999²⁴. Within the age range of 30–39 years old, females were disproportionately impacted; the rate rose to 27.7% in (2015–2016) from 7.3% in (2004–2005). In both rural and urban settings, compared to single, married women had a higher prevalence of obesity. The educational system also had a more significant effect on the rate of obesity to put it another way, it provides obesity with some benefits. Women who have not completed elementary school are more likely to have a rapid increase in their body mass index. However, the rate of obesity among scheduled tribes, scheduled castes, and other socially disadvantaged groups increased between 1998 and 2016²⁵.

Studies have indicated that in the present OECD scenario, obesity affects more than one in two adults and one in six children. Some techniques and planning are combined in food labels to increase nutritional information via the news media, social networks, etc. (especially through communication) to combat the epidemic of obesity²⁶.

It aids in enabling individuals to make more informed food item selections. Based on the OECD's study on health-related behaviors among school-going youngsters published in 2000, children's weight began to rise steadily at the age of 15 in both England and France, while it remained steady for children aged 3 to 17 in France.

Organization for Economic Cooperation and Development (OECD) is a group of 36 nations that came together in 1961 to promote economic growth and international commerce. Roughly 19.5% of adults were overweight in 2015, according to OECD data. Information like this varies greatly across nations. Nations like Korea and Japan have far lower rates of obesity (6% adults) than nations like Mexico, New Zealand, the USA, and Hungary (>30% adults). Since 1990, this variety has expanded dramatically in Mexico, the U.S., and England. The rate indicated above has been lower in seven more OECD nations. In the US, Canada, France, Mexico, and Switzerland, the incidence of obesity has increased, whereas the trend has remained stable in the United Kingdom, Italy, Korea, and Spain. This demonstrates that overweight and obesity are still widely prevalent. According to reports, the incidence of obesity among people aged 11 to 19 in India is significant (11%–29%). In contrast to the 4.7% of obese adolescents in rural areas, metropolitan areas had 11.6% of this age group. This disparity may be attributed to differences in diet, transportation, and other factors. recent

statistics from Pune suggest that Twenty percent of Maharashtra's boys ages 10 to 15 were overweight, and another 5.7 percent were obese²⁷. The incidence of overweight among children aged 9 to 15 in a 2002 study conducted in Ludhiana, Punjab, was 11%-14%. Meanwhile, a comparable poll performed in Chennai indicated that 17% of children were overweight and 3% were obese, while a similar survey conducted in India found that 29% of children aged 4-18 were overweight²⁸.

Management of obesity

Obesity management takes several forms. It may be divided into two types pharmacological and non-pharmacological. Alternative methods of treating obesity that doesn't use drugs include a wide range of preventative measures and strategic approaches²⁹.

Diet & Behavior modification- Calorie counting, fat restriction, regular exercise, and a healthy lifestyle are all part of a comprehensive diet program. The result of this coordinated program is a 5–10% weight loss³⁰. Patients are more likely to continue taking their medications in the first year after starting them if they get nutritional counseling. A nutrition counselor's first step in helping a patient overcome obesity and adopt healthy lifestyle habits is to learn about that person's dietary and physical activity habits throughout time. Counselors help clients lose weight by recommending meal plans and calorie counts³¹.

Many super-foods not only support general health but also have unique constituents, antioxidants, and micronutrients that may help with weight loss³². The greatest diet is the one that patients can stick to the most consistently, and the most successful diets for weight reduction include low-carbohydrate and low-fat eating plans. Calorie consumption should be reduced by 500–1000 kcal/day for weight reduction to occur, as recommended by the National Heart, Lung, and Blood Institute³³. The 2005 Dietary Guidelines for Americans state that those who are over 154 pounds in weight have a higher basal metabolic rate (BMR) and hence burn more calories per hour than people who are over 154 pounds in weight. One must lose between one and two pounds each week, as well as 500 to 1,000 calories per day by eating less food or working out more³⁴. Energy can only be burned via physical exercise. According to the United States Preventive Services Task Force, behavioral therapy may result in a 6-percent weight reduction over the course of a year. An important part of any behavioral weight control program is self-monitoring, according to the National Weight Control Registry. Diaries of what you eat, how much exercise you get, and how much weight

you gain or lose is all included. It is more successful for weight reduction when combined with dietary and pharmaceutical interventions³⁵.

Motivational interviewing- By assisting patients in identifying and resolving internal conflicts, motivational interviewing is a goal-oriented counseling technique for bringing about positive behavioral changes³⁶. It's the most effective strategy for those who are committed to losing weight on their terms. Among the many aspects of motivational interviewing are the following: agenda framing; investigation of patient desire; exploration of patient ability; exploration of patient reasons; information gathering; listening and summarizing; and the generation of options and contracts³⁷.

The US Preventive Services Task Force (USPTF) came up with the 5As approach to reducing body weight and obesity for patients who are eager to make positive changes to their lifestyle showing in **Figure 1**.

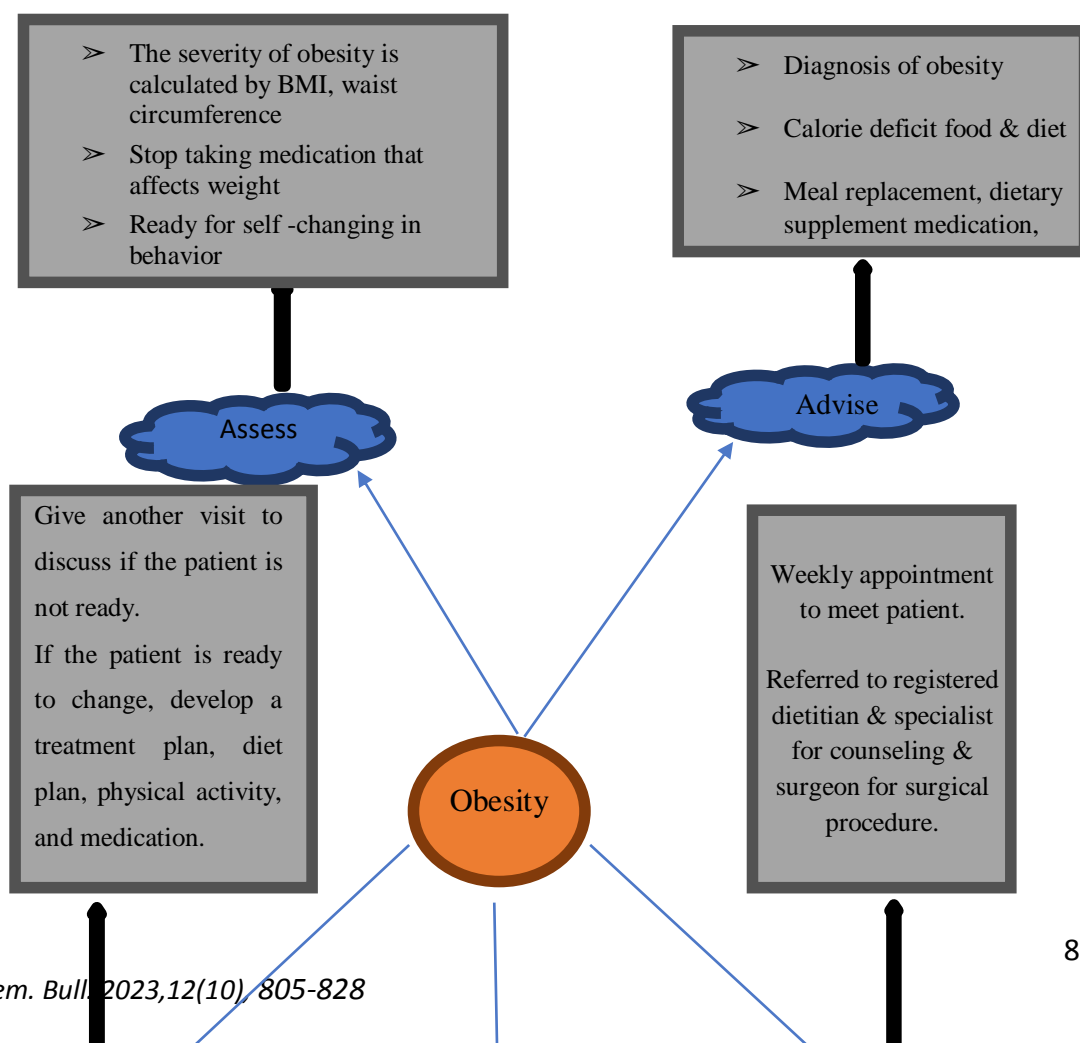


Figure 1. Flow diagram for obesity management

Approaches to treat obesity

Physical activity- The term "physical activity" refers to the use of skeletal muscles to generate metabolic heat. It doesn't matter when the time of day or night you do it. Intentional or unintentional, it is a routine performed to raise one's physical fitness levels³⁸. The risk factors for several potentially fatal illnesses may be reduced with regular physical activity, and maintaining a healthy mental state also benefits from exercise. Strength, stamina, bone density, muscular development, and stress relief are all improved as a result. It has the potential to boost kids' and teens' confidence. Exercise should be done three to five days a week for at minimum half an hour, according to the National Heart, Lung, and Blood Institute. Regular exercise is essential for maintaining metabolic rate, which in turn aids in the reduction of blood pressure and cholesterol³⁹⁻⁴⁰. The American College of Sports Medicine has started a campaign to make fitness assessments a standard part of healthcare and wellness programs. According to the Physical Exercise Guidelines for Americans (2008), individuals need to be healthy, one should engage in at least 150 minutes of medium-intensity strenuous exercise or 75 minutes of high-intensity strenuous exercise per week. Dancing, biking, walking, mild gardening, lifting weights, and stretching are all examples of moderate physical exercise that burn between 370 and 330 calories per hour and between 290 and 280 calories per hour, and between 220 and 180 calories per hour, respectively. Bicycling,

walking, and aerobic exercise all burn around the same amount of calories each day⁴¹, however in the case of severe physical activity, the numbers rise to about 590kcal, 460 kcal, and 480 kcal, respectively⁴⁰.

Mental health & Mood- People's mental well-being is connected to their engagement in healthful activities, such as maintaining a balanced diet and engaging in regular physical exercise⁴². The states of one's mind and one's emotional behavior have a significant effect on one's body mass index. Obese persons, compared to healthy adults or children are prone to experience mental health problems like anxiety and depression. Obesity may be mitigated in part by lowering stress levels, as has been shown in several studies⁴³.

Sleep Hygiene-Sleep deprivation has been linked to changes in metabolism and the endocrine system, including impaired glucose tolerance and insulin sensitivity, elevated cortisol levels in the evening, higher levels of the hunger hormone ghrelin, and lower leptin levels, as well as an increased appetite⁴⁴. Inadequate sleep of fewer than 7.75 hours per day was also associated with a 1.6-fold increased risk of obesity in males and a 4-fold increased risk of obesity in girls⁴⁵.

Media Usage-Increases in children's screen time is connected with an increased risk of obesity, according to recent studies⁴⁶. This is due to many factors, including but not limited to increased body fatness, reduced energy expenditure, insufficient physical activity etc⁴⁷.

Surgical method- Surgery known as bariatric surgery may be an option for treating morbid obesity when it presents a life-threatening risk owing to its relationship with other health conditions. People with a BMI of more than 40 are prioritized for bariatric surgery⁴⁸. When dietary and supplement adjustments, increased exercise, and utilization of medication all fail to bring about the desired results, bariatric surgery has emerged as a viable option. Bariatric surgery may be an option for patients with a BMI of 35 or above who are at risk of developing major health issues due to their obesity⁴⁹. The Swedish Obese Subjects study found that when laparoscopy was used instead of open surgery, death rates dropped by 24%. Myocardial infarction and cancer mortality rates dropped, contributing to this advantage. There are three weight loss surgeries available: gastric restriction, malabsorption, and a combination of the two. Sjöström et al. (2007) found that when people ate less, there were some subtle changes in their digestive systems⁵⁰.

Roux-en-y The most popular and permanent technique in the United States is called gastric bypass. This surgical procedure reduces nutrition absorption and necessitates dietary

restrictions. This procedure involves making a little incision at the top of the stomach and sealing it up, while also bypassing a section of the small intestine. Furthermore, it causes a rise in metabolic rate⁵¹. In 9-14 months following surgery, people lose 60%-70% of their excess weight⁵². However, this procedure has been linked to some potential drawbacks. Because of the increased complexity of the procedure and the subsequently extended hospital stay, this condition is more common. Deficiencies in essential nutrients like vitamin B12, iron, calcium, etc., may occur after surgery and need a lifetime of vitamin and mineral supplementation⁵³.

Sleeve gastrectomy – About 80% of the stomach is removed in sleeve gastrectomy, leaving a small, vertical pouch that can't store much food and hence produces less of the appetite-regulating hormone ghrelin⁵⁴. There is no need to extend your hospital stay for this kind of surgery, which results in quick and dramatic weight reduction and is permanent. However, persistent vitamin deficits have been seen in the postoperative period⁵⁵.

Adjustable band- The procedure is the most intrusive option. A sleeve gastrectomy is similar to this procedure. The only difference is that the last section of the intestine has been surgically joined to the duodenum, reducing the quantity of food that can be eaten and the number of nutrients that can be absorbed. Biliopancreatic rerouting with a duodenal switch is another name for this procedure. The weight reduction from this surgical procedure is superior to that of any other⁵⁶. It is acceptable for patients to consume their regular meals and snacks. Patients with diabetes will not get positive results from this approach. Because of this, patients often have a greater number of complications and need lengthier hospital stays than expected⁵⁷.

Laparoscopy surgery- If our obesity is severe enough, laparoscopic surgery may be an option. A laparoscope, a specialized telescope, was used to examine the digestive tract. It's a rather safe and straightforward surgical technique. The stomach was sliced vertically, a plug was removed from the distal end to create a rate-limiting stoma, and then a piece of propylene was inserted into the hole and stapled to itself. Since no significant incisions need to be made, blood loss and suffering are reduced⁵⁸. The most popular purely restrictive procedure is the laparoscopic adjustable gastric band technique. The laparoscopic adjustable gastric band has advantages over other bariatric procedures, including lower perioperative morbidity and mortality, but it has also been linked to significant intermediate and long-term risks. Though findings from extended follow-up have been discouraging, vertical banded

gastroplasty was linked to reduced perioperative mortality and satisfactory early weight loss⁵⁹.

Obesity treatment by drugs:

There has only been one long-term phentermine study and it was conducted back in 1968. Sixty-four participants spent 36 weeks receiving placebo, continuous dosing with 30 mg of phentermine per day, or intermittent dosing with 4 weeks of dosing followed by 4 weeks off. The average weight loss for the phentermine groups was 13%, whereas the placebo group decreased only five percent of their weight⁶⁰.

Diethylpropion is a drug used to treat obesity for shorter periods of time. It exerts its effect by regulating the activity of norepinephrine. Average weight loss in 69 obese adults taking diethylpropion 50 mg two times per day for 6 months was 9.8 percent, compared to 3.2 percent in the placebo group, according to a randomized, double-blind, placebo-controlled trial with an open-label extension⁶¹.

Qsymia (controlled-release phentermine and topiramate) was given FDA approval in 2012 as a long-term therapy for obesity in adults with a body mass index (BMI) of 30 or more, or a BMI of 27 or more with a minimum of one weight-related comorbidity. There is speculation that phentermine's appetite-suppressing effects are a result of the drug's ability to increase norepinephrine release and decrease its uptake in the hypothalamic nuclei⁶².

In September 2014, the Food and Drug Administration authorized the use of the bupropion and naltrexone combination tablet Contrave for the treatment of obesity. Dopamine and norepinephrine reuptake inhibitor bupropion stimulates central melanocortin pathways⁶³. Naltrexone, an opioid receptor antagonist, reduces the auto-inhibitory feedback loop of mu-opioid receptors on bupropion-activated anorexigenic hypothalamic neurons, allowing for long-term weight loss⁶⁴. Imcivree, also known as Setmelanotide, is a medication that acts as an agonist for the melanocortin-4-receptor (MC4R). It received FDA approval in November 2020 for the treatment of monogenic obesity in individuals aged 6 years or older⁶⁵. Alpha-melanocyte stimulating hormone (MSH), that is the endogenous agonist of MC4R, is created when leptin binds to its receptor inside of the cell by intracellular PCSK1⁶⁶.

Drugs reduce intestinal fat absorption

Orlistat (marketed as Xenical) has been shown to be effective for both adult and adolescent (ages 12-16) obesity⁶⁷. It aids weight loss by blocking fat absorption in the digestive tract by

inhibiting gastrointestinal lipases. Orlistat reduces the absorption of fat by 30% when 120 mg is taken three times daily, on average⁶⁸. The effectiveness of orlistat to prevent the absorption of fat from solid foods was found to be greater than that of liquids⁶⁹.

Drug increases energy consumption- Ephedrine and caffeine are an example of a drug that increases energy consumption. It was demonstrated over a lengthy placebo-controlled clinical trial that the combo of these two medications had a greater impact on obesity than each medicine alone. Some health supplements have incorporated this ingredient. However, the U.S. food and drug administration has not authorized the use of these two medications together for weight reduction⁷⁰.

Anti-diabetic drugs-An agonist at the glucagon-like peptide receptor, liraglutide is used to treat diabetes. Intestinal cells produce this hormone. Insulin secretion is prompted, while glucagon production is inhibited. Not only does it slow down digestion, but it also suppresses your appetite. This compound has a very long half-life of 13 hours. In this case, one-a-day dosing is permitted. Long-term safety and efficacy have been established by the FDA⁷¹. Daily dosages of 1.2 and 1.8 milligrams of liraglutide cause weight loss of 2.5 to 4 kilograms, however only daily doses of 3.0 mg are authorized for usage in the long-term management of obesity. Diabetes experiments using a 56-week scale found that a recommended dosage of 3.0 mg caused weight loss to slow by 6%. In addition to lowering blood sugar levels, liraglutide may lower glucagon levels in the morning. There is a decreased potential for cardiovascular issues as a result. Medicine-wise, it's a better option for those who are overweight, have diabetes, or have heart problems. Westerterp *et al.* (1995) found that using this medication in conjunction with a healthy diet and regular exercise had the greatest results⁷². Metformin is an additional kind of anti-diabetic medicine, an insulin sensitizing agent from the biguanide family. Improved insulin sensitivity in peripheral tissue is how it accomplishes its effect causes the liver to produce less glucose. Intestinal glucose absorption is lowered, and insulin production is not stimulated⁷³. Table 3 lists several more FDA-approved medications used for long-term treatment⁷⁴.

Table 3 FDA-approved drug for the treatment of obesity

Drugs	Drug's mode of action	Dose	Adverse effects	Loss of weight

Lorcaserin	5-HT-2c (serotonin) receptors activation	10mg taken twice daily	backache, lethargy, constipation, hyperglycemia, and other symptoms	3.20 kilogram over a year
Liraglutide	GLP1 receptor agonist	3 milligrams, s.c, once every day	nausea, headache, vomiting, and a rise in cholesterol levels	3–4 kilograms over a year
Topiramate-Phentermine	Activate the release of norepinephrine and GABA	3.75 mg of phentermine and 23 mg of topiramate once every day (loading dose) 7.5 mg of phentermine and 46 mg of topiramate once every day (maintenance dose)	Paresthesia, vertigo, nausea, and sleeplessness	3.6 kilogram over six months
Bupropion-Naltrexone-	Opioid receptor blocker, norepinephrine, and Dopamine reuptake inhibitor.	Everyday loading dose: 2 tabs 180 mg of bupropion and 16 mg of naltrexone, 1 tab 90 mg of bupropion and 8 mg of naltrexone twice daily (maintenance dose)	Diarrhea, dry mouth, sleeplessness, and nausea	3.4 kilogram over a year

Diethylpropion	Activate the release of central norepinephrine	75 milligrams once daily and 25 milligrams three times daily.	Irregular heartbeats, sleeplessness, and headache	3 kilogram over six months
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Several drugs are banned for anti-obesity⁷⁵ due to the following reason listed in Table 4

Table 4 List of the banned drug for obesity

Drug	Year	Reason for prohibition
Dinitrophenol	1938	Agranulocytosis, dermatitis, neuropathy, and impaired vision
Aminorex	1968	Persistent respiratory hypertension
Amphetamine	1971	High blood pressure, cardiac toxicity, and addictions
Phenylpropanolamine	2000	Hemorrhagic shock
Rimonabant	2009	Mental illness, despair, and suicidal tendency
Sibutramine	2010	The threat of serious heart problems

Conclusion

The first step in reducing the worldwide health risk associated with obesity is raising public awareness of the issue. Its risk factors and the ways in which they may be mitigated or managed by the use of a variety of preventative measures (for example, exercise a healthier diet, and other lifestyle adjustments, as well as medication). Many individuals in rural and urban areas pay closer attention to what doctors say than they do to what the government or health organizations say, thus In the initial phases of preventing obesity, doctors might be extremely important. In order to build a healthy nation, it is imperative that all doctors and primary care givers initiate a patient promotion campaign.

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CONFLICT OF INTEREST

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