

Obesity in Modern Society: Analysis, Statistics, and Treatment Approaches

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Abstract: *The article explores the prevalent issue of obesity, providing a comprehensive analysis of its current statistics, prevention strategies, and treatment options. It delves into the health risks associated with obesity and emphasizes the importance of addressing this public health challenge through various interventions.*

Keywords: Obesity, weight loss, overweight, prescription weight loss drugs, Obesity prevention

1. Introduction

The significance of this article lies in its comprehensive analysis of obesity, a major public health concern, and its aim to inform and guide effective interventions.

Background

Overweight and obesity are a health threat and a significant public health challenge. Data collected between 2017 -2020 show 41.9 % of adults in the U.S. have obesity⁽¹⁾, 19.7 % of adolescents and children in the US have obesity⁽²⁾ and worldwide, more than 1 billion people have obesity – 650 million adults, 340 million adolescents, and 39 million children, according to WHO⁽³⁾. Being overweight puts patients at increased risk for coronary heart disease, hypertension, heart disease, stroke, diabetes, certain types of cancer, and premature death.

Overweight and obesity statistics⁴

Body mass index (BMI) is a tool to estimate and screen for overweight and obesity in adults and children. BMI is defined as weight in kilograms divided by height in meters squared.

The table below shows BMI ranges for overweight and obesity in adults 20 and older.

BMI of Adults Ages 20 and Older

BMI	Classification
18.5 to 24.9	Normal, or healthy, weight
25 to 29.9	Overweight
30+	Obesity (including severe obesity)
40+	Severe obesity

A child's body composition changes during growth from infancy into adulthood, and it differs by sex. Therefore, a young person's weight status is calculated based on their comparison with others of the same age and sex.

BMI for Children and Teens

Weight Status Category	Percentile Range
Underweight	Less than 5th percentile
Normal or healthy weight	5th percentile to less than 85th percentile
Overweight	85th to less than 95th percentile
Obesity	95th percentile or greater
Severe obesity	120% of the 95th percentile

Prevalence of Overweight and Obesity

Adults

Age-adjusted percentage of US adults with overweight, obesity, and severe obesity by sex, 2017–2018 NHANES

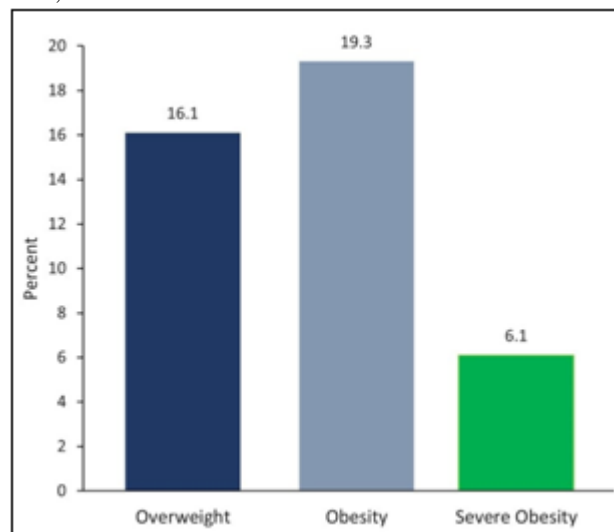
	All (Men and Women)	Men	Women
Overweight	30.7	34.1	27.5
Obesity (including severe obesity)	42.4	43.0	41.9
Severe obesity	9.2	6.9	11.5

As shown in the above table

- Nearly 1 in 3 adults (30.7%) are overweight.
- More than 1 in 3 men (34.1%) and more than 1 in 4 women (27.5%) are overweight.
- More than 2 in 5 adults (42.4%) have obesity (including severe obesity).
- About 1 in 11 adults (9.2%) have severe obesity.
- The percentage of men who are overweight (34.1%) is higher than the percentage of women who are overweight (27.5%).
- The percentage of women who have severe obesity (11.5%) is higher than the percentage of men who have severe obesity (6.9%).

Youth

Prevalence of overweight, obesity, and severe obesity among children and adolescents ages 2 to 19 years: United States, 2017–2018 NHANES data



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NOTE: Excludes pregnant females. Overweight is body mass index (BMI) at or above the 85th percentile and below the 95th percentile from the sex-specific BMI-for-age 2000 CDC Growth Charts. Obesity is BMI at or above the 95th percentile. Severe obesity is BMI at or above 120% of the 95th percentile. SOURCE: National Center for Health Statistics, National Health, and Nutrition Examination Survey.

Graphic representation created by the NIDDK.

According to the 2017–2018 NHANES data

- Among children and adolescents ages 2 to 19, about 1 in 6 (16.1%) are overweight, more than 1 in 6 (19.3%) have obesity, and about 1 in 18 (6.1%) have severe obesity.

Obesity Prevention⁵

A primary reason that prevention of obesity is so vital in children is because the chances of childhood obesity persisting into adulthood increase as the child ages.

Childhood obesity

- 1) As a parent, eat healthy food, engage in physical activity, and set an example. A child is likely to do the same.
- 2) Encourage physical activity. Children ages 3 to 5 should have active play each day. Children ages 6 to 17 should have at least 60 minutes of medium physical activity most days of the week. More than 60 minutes of activity may help you lose weight and keep healthy.
- 3) Encourage children to eat only when hungry. Tell them to eat slowly.
- 4) Encourage your child to drink water instead of drinks with added sugar. These include soft drinks, sports drinks, and fruit juice drinks.
- 5) Don't buy soft drinks or snacks high in sugar and fat.

Adults

Good eating habits and physical activity can help prevent obesity. Suggestions for adults include:

- 1) Choose whole-grain food. These include whole wheat bread and brown rice. Avoid food made with refined white sugar, flour, high fructose corn syrup, or saturated fat.
- 2) Read food nutrition labels and use them.
- 3) Reduce portion sizes.
- 4) Exercise each week. Aim for at least 150 minutes of moderate to intense physical activity weekly.

Weight Loss Drugs: Over the Counter (OTC) and Prescription

OTC⁶

It is tempting to seek help anywhere when you want to lose weight. Keep in mind that research gives mixed reviews to supplements or herbal remedies. Sometimes, there isn't enough science to back those claims, and some have health risks. Talk to your doctor or pharmacist before you try any.

FDA does not regulate supplements in the same way as food and drugs are. The FDA does not review these supplements for safety and efficacy before they are marketed.

Green tea extract

It supposedly works by curbing your appetite and raising calorie and fat metabolism. But there isn't enough evidence to rate how well it works.

Side effects include nausea, bloating, insomnia, bloating.

Green coffee extract

Studies suggest it may lead to modest weight loss, but again, there needs to be more good research to determine its effectiveness.

Side effects include headaches, stomach upset, insomnia, and abnormal heart rhythms.

Ephedra

This herb contains the stimulant ephedrine. It is closely related to pseudoephedrine and phenylpropanolamine. FDA banned supplements with ephedra after the herb was linked to severe side effects, including heart attack, arrhythmia, stroke, seizure, and death.

Bitter orange

The bitter orange fruit rind contains synephrine, a stimulant related to ephedrine. It supposedly works by raising the number of calories burned. After the FDA banned weight loss products containing ephedra, many makers switched to bitter orange, but it's unclear whether it's safer. Some studies show bitter orange supplements can raise blood pressure and heart rate. There have been reports that they may have had dangerous side effects in people who took bitter orange alone or combined with another stimulant such as caffeine. The risks include stroke, irregular heartbeat, heart attack, and death.

Alli® (orlistat)⁷

It is the only FDA-approved 2007 nonprescription medication for overweight patients ages 18 and older who are also on a reduced-calorie, low-fat diet. Alli® is formulated in 60 mg capsules, which should be taken within 1 hour of each fat-containing meal, up to 3 capsules daily. Orlistat's pharmacological effect occurs through the inhibition of gastric and pancreatic lipases in the gastrointestinal tract, which prevents triglyceride hydrolysis and results in the decreased absorption of dietary fats, which are excreted through the feces, alli® reduces dietary fat absorption by approximately 25% at the recommended dose. Efficacy increases in a dose-dependent manner up to approx. 300-400 mg per day, a plateau is observed.

Side effects include changes in bowel function due to unabsorbed fat. fatty/oily stool, oily spotting, intestinal gas with discharge, a feeling of needing to have a bowel movement right away, an increased number of bowel movements, or poor bowel control may occur.⁸

Prescription weight loss drugs

Orlistat rx (Xenical): A 120 mg lipase inhibitor is taken with a low-fat meal. Side effects include flatus with discharge, fecal urgency, and fatty stool.

Phentermine (Adipex-p) is the oldest and most widely used short-term appetite suppressant. It is available in 15-37.5 mg doses taken before or after breakfast. Side effects include headache, overstimulation, high blood pressure, rapid or irregular heart rate, and tremor. Interaction may occur during or within 14 days of using monoamine oxidase (MAO) inhibitors—sympathomimetics, alcohol, and possibly some anesthetic agents.

Diethylpropion (Tenuate): an appetite suppressant available in 2 formulations: 25 mg immediate release taken three times a day 1 hour before meals and mid-evening, and 75 mg sustained release taken once in mid-morning. Side effects include headache, overstimulation, high blood pressure, rapid or irregular heart rate, and tremor. Interaction may occur during or within 14 days of using monoamine oxidase (MAO) inhibitors.

Phentermine-topiramate (Qsymia): it should be used with a reduced-calorie diet and increased physical activity for chronic weight management in adults with a BMI of 30 or greater (obese) or 27 or greater (overweight) with at least one weight-related medical condition such as high blood pressure, type-2 diabetes, or high cholesterol. Pediatric patients aged 12 years and older with an initial BMI in the 95th percentile or greater standardized for age and sex. Side effects include numbness or tingling in the hands, arms, feet, or face, loss of taste, insomnia, constipation, and cognitive impairment. It is contraindicated in patients with hyperthyroidism, glaucoma, pregnancy, and lactation.⁹

Naltrexone-bupropion (contrave): Naltrexone-bupropion combines an opioid receptor antagonist with an antidepressant to affect the pleasure-reward areas of the brain, thereby decreasing cravings and appetite. Some patients may lose 5–10% of body weight. Start with a daily dose of one 8/90 mg tablet and gradually increase to four daily tablets. The most common side effects include nausea, constipation, headache, vomiting, dizziness, insomnia, dry mouth, and diarrhea. This medication should not be prescribed to a patient who has a seizure disorder or who takes opioids for chronic pain.¹⁰

Semaglutide (wegovy, Ozempic): Semaglutide is a glucagon-like peptide-1 (GLP-1) receptor agonist that mimics the naturally occurring GLP-1 hormone that is released by the intestines into the bloodstream within minutes after ingesting food. Semaglutide regulates food intake and promotes weight reduction by suppressing appetite and increasing the feeling of fullness. The medication was first introduced in 2017 as a medication for type-2 diabetes under the brand name Ozempic. It has strengths (0.25mg, 0.5 mg, 1mg, and 2 mg). Later in the year 2021, it received FDA approval for chronic weight management under the brand name Wegovy, also available in various strengths (0.25mg, 0.5 mg, 1mg, 1.7 mg, and 2.4mg). Both these medications are to be injected under the skin once a week. The side effects include stomach pain,

fatigue, feeling bloated, belching, gall bladder problems, pancreatitis, kidney problems, and hypoglycemia.¹¹

Tirzepatide (Mounjaro, Zepbound): Tirzepatide is a GIP and GLP-1 agonist. Despite the similarities between the two incretins, it should be noted that although GIP activity is mainly pancreatic, GLP-1 activity is systemic.¹² Tirzepatide received approval from the FDA in May 2022 under the brand name Mounjaro for treating type 2 diabetes. The medication has various strengths (2.5 mg, 5 mg, 7.5 mg, 10 mg, 12.5 mg, and 15 mg). The drug got its approval for weight loss from the FDA on November 8, 2023. The major adverse effects of the medication include the risk of thyroid C-cell tumors, pancreatitis, hypoglycemia, acute kidney injury, severe gastrointestinal disease, and acute gall bladder disease.¹³ A few other drugs in the pipeline include orforglipron, retatrutide, and danuglipron.

In conclusion, tackling the obesity epidemic requires a collaborative effort encompassing societal, environmental, and individual changes. By fostering a culture of health, implementing evidence-based interventions, and prioritizing preventive measures, it is possible to mitigate the impact of obesity and improve the overall well-being of populations worldwide. It's incredible where we are now in the treatment of obesity compared to where we were as recently as five or ten years ago. As more physiological mechanisms for weight gain have been unearthed, drugs targeting newly discovered receptors and/or enzymes have been introduced with improved safety profiles and fewer psychological adverse events.

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