

MANAGING NUTRITION IN THE AGE OF OBESITY

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Abstract: Obesity is a worldwide problem affecting millions of people with serious consequences for health and quality of life. It occurs when calorie intake exceeds energy intake, leading to excessive accumulation of body fat. This article presents the causes of obesity, the factors that influence it and some effective ways to combat it. This disease is associated with a wide range of medical conditions, a sedentary lifestyle and an unhealthy diet. Since 2015 there has been the World Obesity Day, an annual event celebrated globally, that is dedicated to fighting obesity. The aim of this event is to raise awareness and prophylaxis and to tackle this problem, which started to be represented in all age groups worldwide. Lately, after 2020, we also noticed a significant increase in the phenomenon at the national level, both among adults and children.

Keywords: obesity, nutrition, energy, technology

1. Introduction

Excess weight, an unhealthy diet and a lack of physical activity are major risk factors that can lead to conditions such as diabetes, cardiovascular disease, and mental health disorders among others.

Obesity awareness started as a regional campaign, the *European Obesity Day* (EOD), first organized in May 2010 with the participation of a small group of involved physicians and patients [1], and, in a relatively short time, it has developed into a major event. By means of these campaigns and the involvement of more and more people in raising the awareness of obesity, the aim was to raise the alarm that this disease, which has developed spectacularly in recent decades, is also a stimulant of other diseases.

The question “Can obesity be considered a disease?” was not unanimously answered, as not all criteria were met [2]. An expert panel, organized at the Obesity Society

(TOS) concluded that obesity could only be considered a disease from a utilitarian point of view [3].

Obesity itself is a disorder, a condition that can be affected by a myriad of factors such as genetic, environmental, behavioural, physiological, psychological, economic, and social [2].

According to the Ministry of Health, in the year 2024, the prevalence of obesity in the country was 36% [4]. The same sources indicated that by 2035, about 51% of the world’s population will be at least overweight.

All these data are worrying at both national and global level, with longevity and quality of life at risk.

2. The causes of obesity

In recent decades, the prevalence of obesity has increased progressively [5], with 1.9 billion people worldwide being expected to have the condition in the near future.

Childhood obesity is also predicted to increase by 100% between 2020 and 2035 [6].

The World Health Organization defines obesity as “abnormal or excessive fat accumulation that may impair health. Obesity is characterized not only by excess AT, but by increases in the masses of other

“companion” organs and tissues and their related metabolic properties” [7]. Obesity is not only caused by diet and lack of exercise, but also by external and internal factors such as childhood eating habits, sleep deprivation, excessive use of technology, etc. (Figure 1).

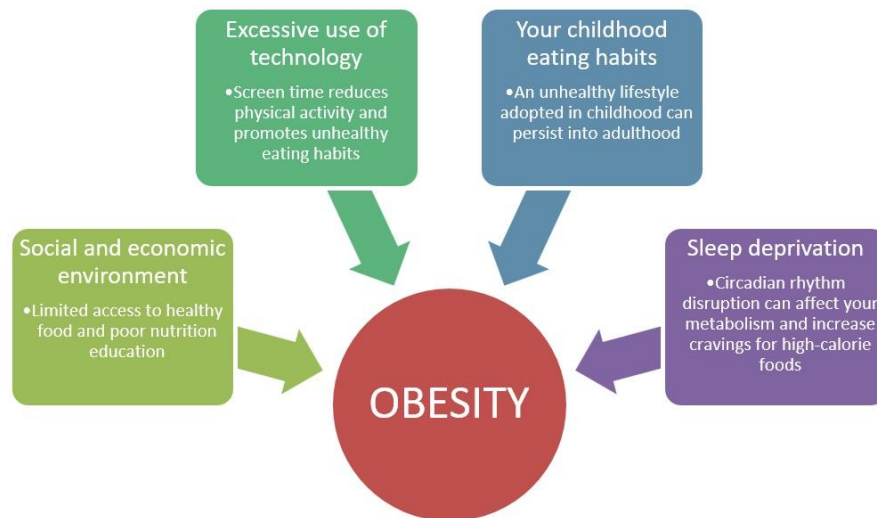


Figure 1: External and internal factors that can cause obesity

Obesity can be caused by a combination of genetic, lifestyle, behavioural and environmental factors. The main causes

may include an unbalanced diet, a sedentary lifestyle, hormonal problems, genetic factors or psychological factors. (Figure 2)

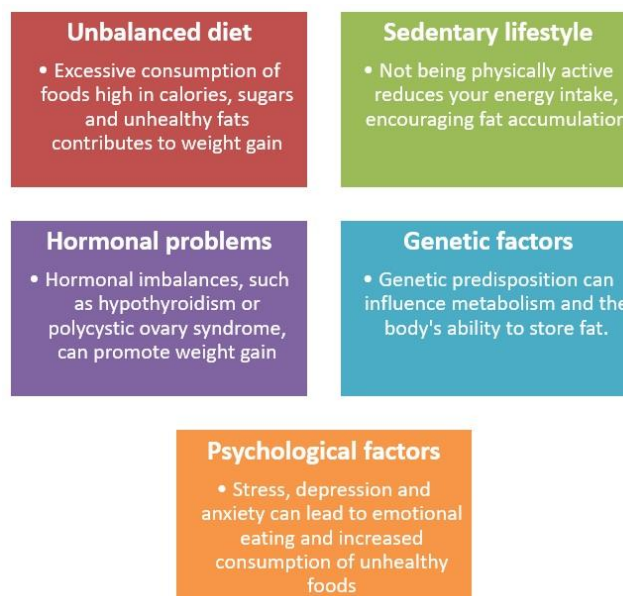


Figure 2: Grounds for obesity

The human body gains weight when it consumes more calories over a longer period of time than it uses. This creates an energy imbalance, i.e. the amount of energy we take in is much greater than the amount of energy we need. This starts to be shown over time in the build-up of adipose tissue and these are the first signs of being overweight.

“Chronic positive energy balance leads to obesity and the “excess” weight is usually described as consisting solely of adipose tissue (AT) or its two components, fat and fat-free mass (non-fat cell mass, extracellular fluid)” [7].

“The size of this adipose store is a result of the balance (or imbalance) between calories consumed (carbohydrate or fat, with a smaller contribution from protein) and calories used, over a long period of time” [8].

3. Energy expenditure

The human body needs energy to manage even the simplest activities such as breathing or digesting food. Understanding that daily energy expenditure is limited changes our perspective on the current obesity crisis [9].

Nutrition represents more than just eating the right foods – it is about fuelling your body and mind to live a vibrant, fulfilling life. A well-balanced diet impacts not only your physical health but also your mood, energy levels, and overall well-being. Here it is how you can optimize your nutrition for a more satisfying life. A calorie refers to the amount of energy that food provides to the body when consumed and metabolized.

“The term *calorie* has two meanings: the small calorie (cal) and the large calorie, kilocalorie (kcal). The calorie (cal) is the amount of heat or energy that is required to raise the temperature of 1 gram of water by 1°C. The kilocalorie (kcal) is the amount of heat or energy that is needed to increase the temperature of 1 kilogram of water by 1°C” [10].

“Nutrition, as a scientific discipline, is the study of how food and its components

affect growth and development, metabolism, health and disease, and mental and physical performance. Food refers to everything people eat or drink that sustains life and growth” [11].

From an energy point of view, the human body needs food to be able to carry out normal physical activities as well as those specific to sports or sporting events. The food we eat is converted into energy for all our daily activities, but our body also stores energy in the form of glycogen and triglycerides. These are the body’s way of preparing for the future. Sugars are stored as glycogen in the muscle and liver, while grains are stored as triglycerides in the adipose tissue. A healthy adult has 80-85% of most energy deposited in stored fat.

Fat – although it does not look like it – is a very active tissue, constantly changing its actions. Fat is stored following meals, then between meals energy slowly starts to be released to supply cells with food. Fat stores are of paramount importance at critical times of illness, as they nourish cells and help the immune system fight infection.

While the brain needs glucose, the liver, muscles and fat cells prefer to burn fat. The body’s energy expenditure is divided as follows:

- Basal metabolic rate (BMR) 60-75% requires maintaining basic functions such as breathing, circulation, and cell production. These are influenced by age, gender, muscle mass, and genetics;
- Physical activity expends about 15-30%, so the more intense the physical activity, the higher the energy expenditure.

The thermic effect of food (TEF) uses around 10% of the total spending energy. TEF, defined as the increase in metabolic rate after ingestion of a meal, has been studied extensively, but its role in body weight regulation is controversial [12].

“TEF is primarily regulated by acute factors, such as protein and energy intake, and is not a physiological response that can

be permanently adapted or modified by prolonged changes in the habitual diet” [13] It is both absolutely and irrefutably correct that obesity results from eating more calories than we burn. This modern obesity epidemic reflects a failure in the metabolic management [9].

4. Nutrition for a satisfying life

“Our society seems to have an obsession with nutrition, partly because everyone eats but probably because it is also related to how we look and our health.” [14]

For having a starting point in a good nutrition, we need to understand the modern food environment:

- **Ultra-processed foods:** High in sugar, unhealthy fats, and additives, these foods contribute to weight gain and poor health.
- **Portion sizes:** Growing portion sizes in restaurants and packaged foods lead to excessive calorie intake.
- **Marketing influence:** Aggressive marketing of unhealthy foods, particularly to children, affects dietary habits.

For having a healthy lifestyle, we need to try to optimize the energy expenditure. This

could be possible making some small changes in everyday habits. It is very important to stay active, the aim for the physical activity is to achieve at least 150 minutes of moderate or 75 minutes of intense exercise per week. Strength training increases muscle mass, which boosts BMR. Prioritize protein-rich foods for a higher TEF and sustained energy. Water supports metabolism and energy production. Poor sleep can reduce energy levels and metabolism.

Nutrition is more than just eating the right foods – it is about fuelling your body and mind to live a vibrant, fulfilling life. A well-balanced diet impacts not only your physical health but also your mood, energy levels, and overall well-being. Here it is how you can optimize your nutrition for a more satisfying life.

Macronutrients and micronutrients are two categories of nutrients that the body needs to function properly.

4.1. Macronutrients

These are nutrients required in large amounts that provide energy (calories). The three main macronutrients are (Figure 3):

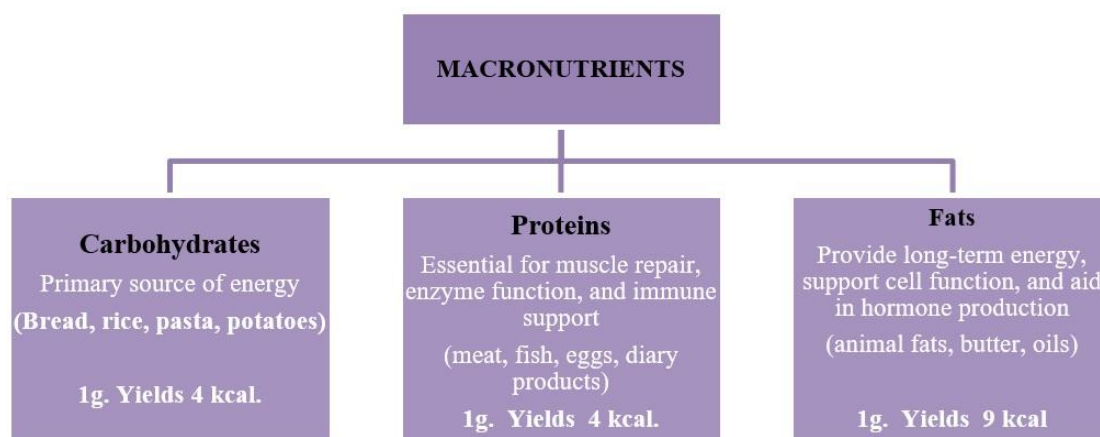


Figure 3: Main macronutrients

45% to 65% of calories per day should come from carbohydrates. The amount depends on an individual’s health goals and medical conditions [14,15]. About 20% to

35% of your total daily calories should come from fat, with less than 10% of total daily calories from saturated fat [14].

4.2. Micronutrients

These are nutrients required in small amounts that are crucial for overall health. “Micronutrients play a central part in

metabolism and in the maintenance of tissue function” [16] (Figure 4).

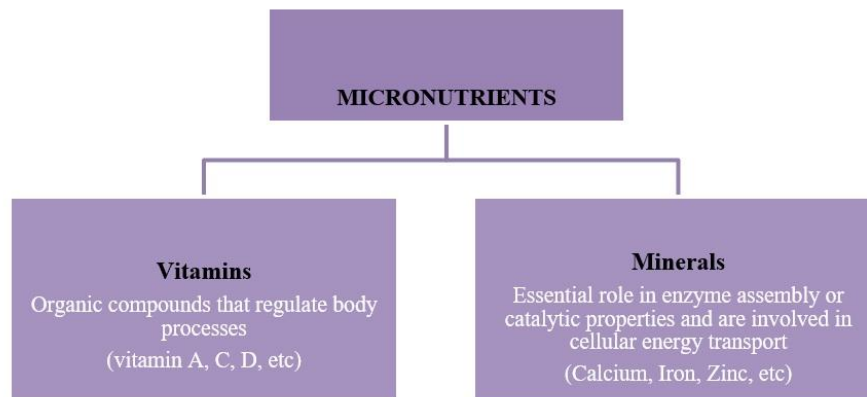


Figure 4: Main micronutrients

Vitamins are divided into two categories fat-soluble vitamins and water-soluble vitamins. The fat-soluble vitamins are deposited in fat tissues and the liver, and can be stored for long periods:

- **Vitamin A** (vision, skin health) – found in carrots, sweet potatoes, liver;
- **Vitamin D** (bone health, immune function) – found in sunlight, fish, fortified dairy;
- **Vitamin E** (antioxidant, skin health) – found in nuts, seeds, vegetable oils;
- **Vitamin K** (blood clotting, bone health) – found in leafy greens, broccoli.

The water-soluble vitamins are not stored in the body and need regular intake:

- **Vitamin C** (immune support, antioxidant) – found in citrus fruits, bell peppers;
- **B Vitamins** (energy production, brain function):
 - B1 (Thiamine) – whole grains, pork;
 - B2 (Riboflavin) – dairy, eggs;
 - B3 (Niacin) – meat, nuts;
 - B5 (Pantothenic Acid) – avocados, chicken;
 - B6 (Pyridoxine) – bananas, potatoes;
 - B7 (Biotin) – eggs, nuts;
 - B9 (Folate) – leafy greens, legumes;
 - B12 (Cobalamin) – animal products, fortified cereals.

Both macronutrients and micronutrients are essential for maintaining good health, supporting growth, and preventing deficiencies. Maintaining a healthy, various nutritional sample wealthy incomplete, nutrient-dense ingredients in good enough portions is vital for preserving fitness and stopping sickness at some point of the lifespan.

The frame desires micronutrients in small quantities to aid biochemical procedures and cell function. To acquire the first-rate outcomes, micronutrient desire sought to be generally met via numerous complete ingredients, routine to supplementation handiest while clinically necessary [17].

5. The role of technology in nutrition management

Nowadays technology plays a crucial role in nutrition management, revolutionizing the way individuals and professionals monitor, plan, and improve dietary habits. Technology has significantly enhanced nutrition management, making it more efficient, accessible, and personalized. From AI-driven meal planning to smart wearables and block chain-based food safety, innovation continues to shape the future of health and nutrition.

Technology has significantly transformed the field of nutrition, making it more

accessible, personalized, and data-driven. Technology is revolutionizing how we approach nutrition, making it more efficient, accurate, and tailored to

individual needs.

Here there are some key roles of technology in nutrition (Figure 5):

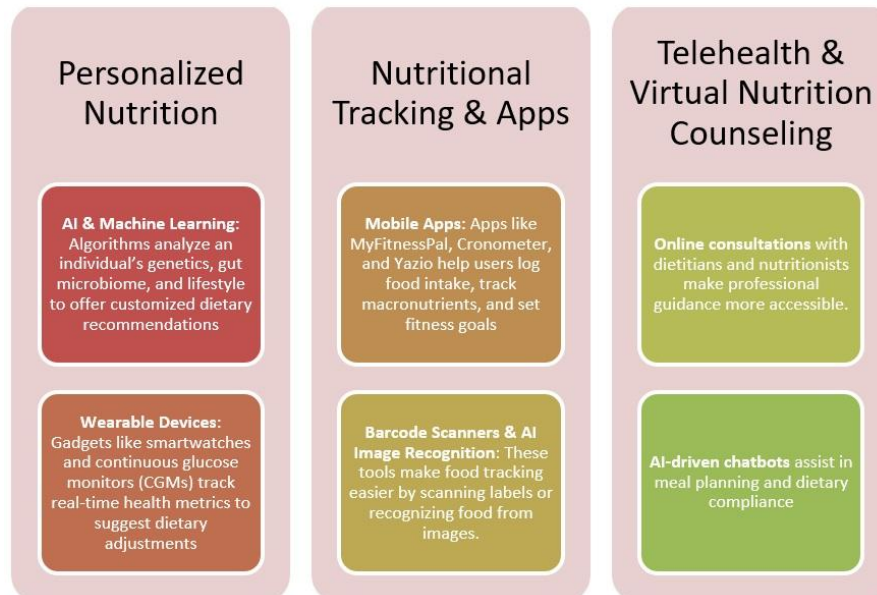


Figure 5: Key roles of technology in nutrition

6. Conclusions

Obesity is a global public health problem, with serious consequences on the quality of life and contributing to chronic diseases such as diabetes mellitus, high blood pressure, and cardiovascular disease. A key element in combating this epidemic is nutrition management, which involves adopting healthy and balanced eating habits.

Nutrition management plays a fundamental role in preventing and fighting obesity. Adopting a balanced lifestyle, based on healthy eating and physical activity, can make a significant contribution to improving overall health and reducing the risks associated with obesity.

To save you and fight obesity, vitamins' control must be primarily based totally on positive sound principles. Adopt a balanced weight-reduction plan with the aid of using growing intake of fruits, veggies and entire grains, decreasing consumption of subtle sugars and trans fats, component manipulate and fending off immoderate intake of processed foods. Nutrition

training is done with the aid of informing the populace about the significance of meals selections and of selling clean labelling of meals merchandise for proper selection. Regular physical activity should be within the list of things that help fight extra pounds. Exercise allows to burn energy and to preserve muscle groups. The advice is to practise a consistent mild physical activity at least one hundred fifty minutes weekly Consulting a nutritionist as well as using apps to monitor the number of calories we ingest helps form healthy habits in terms of nutrition and daily meal plans.

It may be very essential to apprehend that there may be no well-known rule that applies to everyone, simply as there may be no bodily pastime software this is healthful for everyone. Some humans have sure clinical situations that want to be taken into consideration while growing each a consuming plan and a bodily pastime software. Those who do not find themselves in clinical situations would like unique diets, based mainly on everyday activities.

What may be essential to consider is that every people have certain specific habits and any change we make must be useful and beneficial in the saving of each day.

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