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How Food Causes Obesity

Shiqi Shen

Troy university, University Ave, United states, 36082

Sh012549@163.com

Abstract. One of the biggest threats to public health is obesity, which has developed into a concern. Obesity has been identified as an epidemic that affects people of all ages, genders, and ethnicity and requires immediate control and governance. Children and teenagers should be particularly mindful while eating ultra-processed foods. The implications of micronutrient insufficiency or the links between them and obesity are examined in this review of the literature. Findings from the research of university graduates in Spain, Brazilian civil officials, and UK Biobank show a substantial dose-response relationship between obesity and increased intake of ultra-processed meals. Additional literature review indicates the prevalence of obesity owing to its oro-sensory characteristics, satiety levels, and nutritional content.

Keywords: Ultra-processedfood, obesity, nutrition, BMI, food cues, hormones, high-calorie

1. Introduction

Over the past 50 years, there has been a steady rise in the incidence of overweight and obesity, with obesity levels rising globally to epidemic levels. The majority of the time, the causes of overweight and obesity are high dietary energy intake ― primarily due to poor eating habits ― and lower energy expenditure ― primarily due to inactivity and extended periods of inactivity. In adulthood, being overweight or obese is also linked to an elevated possibility of morbidity and death rates from non-communicable chronic diseases, particularly cardiovascular disease, type 2 diabetes mellitus, neurological injuries, and specific kinds of cancer. Being overweight or obese substantially raises cardiometabolic threats throughout daily existence. In addition to its negative effects on physical health, obesity also has a serious negative impact on mental health because people who are overweight or obese frequently face social stigma and social exclusion, which are linked to chronic tension and depression. Being overweight or obese should be prevented and treated as a public health concern. The author aims to analyze how food causes obesity. This review raises awareness of the modifying aspects that contribute to weight gain and the emergence of obesity in adults and children. Consumption of ultra-processed foods such as soft drinks, general diet quality, satiety, and chemical additives in ultra-processed foods are among the variables that will be assessed.

2. Food Consumption Conditioning

The ordinary human body only needs 2,000 to 2,500 calories daily to operate efficiently; the body typically preserves any extra calories as fat for later use. Diets frequently contain more calories than the body needs each day, which causes a significant amount of the calories to be converted to fat. Furthermore, it has been demonstrated that behaviors formed early in life persist far into adulthood ― the chance of becoming obese as they age increases for overweight youngsters. The interplay of these

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elements causes the issues with obesity. The amount of foods ingested is directly influenced by outside contextual food stimuli, which generate behavior that generates the sense of hunger, which in return encourages an individual to eat, according to studies looking at the eating habits of different youngsters [1]. In addition, it has been demonstrated that the quantity of food taken might vary based on the kind and severity of the environmental factor seeking to affect a person.

Such a response is comparable to that observed in many Pavlovian conditioning strategies, whereby the body eventually responds in a preset way to repeated environmental signals, leading to the development of the behavior. In this instance, the body responds to a natural conditioning process after exposure to food stimuli[2]. It is even possible to imply that the drastic sensation of hunger that some people undergo after being subjected to a food signal is caused by the body′s natural Pavlovian conditioning mechanism, which causes the body to respond in a predetermined way in anticipation of eating, such as by changing blood sugar levels, releasing more stomach acid, and producing more saliva [2]. As an outcome, this behavior is associated with the feeling of hunger when, in reality, it was the outcome of a food signal rather than a denial of prior nutrition. On the other side, one such response does not consistently occur case by case; in reality, in some instances, notwithstanding the degree of exposure implicated, the urge to eat does not appear in all youngsters with the same frequency [2]. The notion of restraint, which relates to a person′s stress over their food consumption against the quantity their body properly requires, is therefore associated with this absence of interest or behavioral opposition to the urge to eat. The growing numbers of obese individuals show that each person understands restriction differently. It has been demonstrated by numerous studies that specific behavioral characteristics, among which self-control is one, directly influence an individual′s calorie consumption.

3. Ultra-processed foods and obesity

3.1. Research study

Increased intake of ultra-processed foods was linked to a greater risk of becoming overweight and obese during nine years of follow-up, according to the research of university graduates in Spain [3]. More ultra-processed food intake was linked to higher proportions in body mass index (BMI) and waist measurement throughout an estimated four-follow-up period, according to results of another potential research by Brazilian civil officials (WC) [4]. Food recurrence questionnaires, which are stronger at collecting a larger variety of foods and drinks ingested, notably those from ultra-processed foodstuffs, and may offer more exact nutritional information, were employed in both trials to evaluate dietary consumption instead of 24-hour recall. Using data from the UK Biobank, diets high in ultra-processed foods were significantly related to a rise in the prevalence of obesity and abdominal obesity by 79% and 30%, respectively [5]. In addition, during the follow-up period of about 5.6 years, eating more super processed foods increased the possibility of increasing body fat, WC or BMI by 5% or more [5]. The findings showed a substantial dose-response relationship between obesity and increased intake of ultra-processed meals.

3.2. Cosmetic additions with no nutritional value

Foods that have been industrially processed to the point of being ultra-processed generally comprise cosmetic additions like flavors and colors and little to no whole foodstuffs. Soft drinks, flavor-enhanced dairy drinks, sweet or savory packaged treats, candy, morning cereals, packaged loaves of bread and pastries, regenerated meat products, and pre-made frozen or shelf-stable meals are some instances of ultra-processed foodstuffs. These compositions are actively advertised, convenient, frequently provided in large serving quantities, and quite pleasant. Considering they encourage individuals to consume more than they should, it is clear that popular culture commercials significantly influence people′s eating patterns. It is important to realize that the goal of any marketing campaign is to increase the intake of a specific commodity. Given the high-calorie content and poor nutritional quality of the many junk foods now being sold, the main issue with the existing

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predicament is that the growing intake of junk food is in no respect beneficial. The traditional food processes and dietary routines centered on minimally processed foodstuffs and freshly cooked meals have gradually been displaced by the increased production and intake of ultra-processed items. An increasing amount of research indicates that eating foods that have undergone extreme processing raises the incidence of obesity.

3.3. Qualities of Ultra-processed foods

In addition to their nutrient composition, ultra-processed foods may have different qualities that promote obesity. Variations in hormonal changes like those of ghrelin, which causes hunger, and a spike in eating frequency when consuming an ultra-processed diet are two aspects. Food energy consumption rates for ultra-processed foods were two times higher than those found in foods that had not been processed. The softer, more oro-sensory qualities of ultra-processed meals, which make them simpler to eat and ingest, can be used to justify this. Unlike hard foods, soft foods require less chewing per gram of food and shorter mealtimes. In comparison to a non-processed diet, an ultra-processed diet can cause more weight gain and a marked rise in eating frequency [6]. There is evidence that many obese persons experience constant hunger [6]. Improvements in oral intake, satiation, and water retention may all be correlated in a single direction. Specifically, in ultra-processed foods, the increasing energy density of food products also affects energy consumption and obesity.

Modifications in oral processing, such as mastication frequency and feeding time, might affect satiation [6]. Because the physiological regulator of feeling full on excessive food consumption is impaired, a rise in eating rate could result in a spike in caloric intake. It is apparent that eating speed and energy consumption has a significant positive connection. Enhanced eating speed is another characteristic of obesity, and it has a significant positive correlation with obesity indicators [6]. The sensory signals offered by visual cues, the food′s smell, taste strength, texture, consumer acceptability, and the expectation of its satiating action all impact how much of a meal will be consumed [6]. It has been demonstrated that food texture, in particular, significantly impacts eating habits. The hardness, crunchiness, softness, creamy texture, and thickness of food are all reflected in its mouthfeel [6]. There is strong evidence that eating meals with an easy texture can result in larger bites, less eating per gram of food, and shorter meal times. This may therefore result in a less full feeling and more energy consumption. This texture can be seen in numerous highly processed meals [6].

3.4. Deficient Macro-nutrients that reduce satiety

Other possible explanations for the association between ultra-processed diets and obesity include reduced satiety prospects, initiation of high glycaemic feedback, and the existence or absence of an adherent food matrix, which alters the structure and metabolic behavior of the gut microbiota and encourages obesity as well as other inflammatory illnesses [6]. Regarding deficient micronutrients and fiber, ultra-processed foods frequently have a variable nutritional composition, high-calorie levels, and significant levels of fat, artificial or free glucose, sodium, and chemical additives. Eliminating water, which lengthens the shelf life and lowers transportation expenses but improves the energy density per serving, is one industrial technique that contributes to this nutritional content [6]. Additionally, ultra-processed meals contain more trans and saturated fats and artificial additives to impart higher stability. Ultra-processed foodstuffs are also made to be enticing and to encourage intake.

3.5. Containing more calories

The consuming ultra-processed food may raise the risk of being overweight and obese since it contains more calories, additional free sugars, and fats overall, as well as an inadequate ratio of nutrients that may be responsible for the buildup of body fat. 90% of the energy consumed from ultra-processed food, which made up 57.9% of total calories consumed, comes from added sugars. Consuming ultra-processed foods demonstrated a significant correlation between weight increase and the number of calories from trans and saturated fats.

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3.6. Chemical additives

Chemical additives, frequently employed in producing ultra-processed foods, may also play a role in the mechanisms connecting these food products to obesity. For example, the flavor booster monosodium glutamate, which is present in many ultra-processed foods, may have an endocrine-disrupting impact and lead to obesity [7]. The research found a correlation between MSG consumption and BMI. Additionally, research has shown that leptin plays a significant role in controlling food consumption and energy equilibrium. The hypothalamus is thought to be a possible leptin action site and contains leptin receptor mRNA. Leptin prevented weight growth but did not prevent body weight gain in subjects [7]. Leptin′s influence on energy balance can have anorectic consequences, which the hypothalamic arcuate nucleus is crucial for transmitting. Low-grade inflammation and obesity are brought on by carboxymethylcellulose and polysorbate 80, two emulsifiers that are additionally frequently found in ultra-processed meals. Artificial sweeteners may also increase the risk of obesity by altering the gut flora and promoting basal insulin production. The improper bacteria are driven by our modern, high-sugar, low-fiber, processed eating, while the best bacteria are starved. Our diet has traditionally been extremely rich in complex carbs [8]. Presently, fiber is nearly nonexistent in our eating world. Most of the fiber in most of the processed products we eat has been removed. A high-fat, high-sugar diet influences the gut microbiota significantly, changing its composition and negatively impacting our bodies. Increased energy extraction could all contribute to the detrimental impacts on health. Changes in the body′s control of energy consumption, expenditure, and retention lead to obesity [8]. Recent data indicates that gut microbiota impacts how nutrients are absorbed and how energy is managed. It has also been demonstrated that its content varies in lean and obese persons.

3.7. Bisphenol a and obesity

Ultra-processed meals are frequently packaged in plastic, and several plasticizers, including bisphenol A, have been linked to obesity. Children′s obesity is likely brought on by the environmental toxin bisphenol A (BPA), which has harmful implications for health. Childhood obesity is linked to early BPA exposure [9]. Reusable infant bottles, food storage boxes, and beverage cans frequently comprise BPA. Youngsters can thus readily be subjected to BPA daily, and those who consume a lot of food can do so more quickly [9]. As a result, this usually results in obesity in children. Childhood obesity is considerably more likely to occur in a group with a reasonably high BPA intake than in a group with a relatively low BPA intake [9]. By altering the endocrine-metabolic pathways in adipose tissue, BPA raised the incidence of metabolic diseases and obesity. Individuals are subjected to BPA due to its numerous applications, either through the products they consume or the liquids they ingest [10]. For example, when children drink baby bottles containing BPA substances, they will be exposed to BPA. When they consume canned goods or drink water from pipes that have been treated with bisphenol-A, other individuals are also exposed. Other exposures arise from BPA-made laminations, prosthetic teeth, films, and sheets. Endocrine disruptors known as obesogens are essential in changing lipid homeostasis and fat storage [6]. By altering metabolic rates, upsetting energy expenditure, or altering the control of hunger and satiety, they contribute to obesity [10]. Obesogens disrupt the way that hormones communicate with cells. By activating/deactivating or altering signals, they interfere with the chemical communication of hormones. The endocrine system is made up of glands that control hormones that affect how we feel and how much energy we have. Pollutants from the environment affect it negatively. These contaminants have an impact on how the body manages appetite and fullness. The metabolism-related hormones cause a decrease in the number of calories expended and an elevation in the retention of calories as fat.

4. Discussion

Moreover, most of the time, bad eating habits have been held responsible for the prevalence of obesity among many people. Excessive intake or overeating, which refers to taking too many calories or one particular type of food, is a widespread unhealthy habit [1]. Obesity has been determined to have a caloric intake problem at its core. This could be ingested in the manner of sugary foods with higher

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calorie counts than the body needs, such as sweets, cakes, soft drinks, chocolates, and other sugary meals. An apparent indicator of how many junk meals with high-calorie content individuals consume is the expansion in the amount of soft drink intake and the operation of fast-food restaurants [1]. The kind of food that a person eats greatly contributes to obesity. For example, if someone takes too many foods heavy in fat or refined sugar, they risk becoming obese [11]. According to research, consuming too many refined carbs, fats with a high cholesterol content, trans fats, and very minimal to no fiber significantly impacts how the body uses energy, leading to the buildup of stored fat.

5. Conclusion

In conclusion, the prevalence of intense and ongoing hunger in many obese people may help to clarify how obesity persists and frequently gets worse. Therefore, it′s probable that feeling hungry more often will make people want to eat more. This is often fast-eating, ultra-processed cuisine with a soft texture. This can promote larger bites, which might result in less chewing per bite and less feeling of satiety. This may help to clarify why there is frequently a concurrent rise in severe obesity when a population gets overweight on a global scale. It is evident that although junk food contributes to the nation′s present obesity epidemic, it is not the main factor. Due to its pervasiveness in contemporary culture, which impacts individuals to such a degree that it drives them to purchase the goods of these companies, unrestricted marketing tactics used by numerous corporations to impact Americans to buy their goods are a major contributing component to the obesity challenge that America now confronts. The information on food signals and how they affect people′s behavior is particularly intriguing. Depending on the information in that section, it is reasonable to believe that, even if a person or child is already full, their response to hunger will be elicited when they are shown a static image or a dynamic graphic depiction of a certain food item that appears appetizing. Because of the massive volume of advertising directed directly at children, food commercials featuring cereal, processed foods, and candy constitute the great bulk; this is especially important to consider. As a result, they should be regulated to stop the issue of obesity from worsening. In reality, the interaction of these variables is the main cause of the incidence of obesity. The involvement of the various nutritional deficiencies in relation to obesity and its related disorders requires further research. The research examined in this review are those that looked at whether there might be a connection between a variety of nutritional deficits in ultra-foods and the prevalence of obesity and associated body fat accumulation. The clarity of these relationships may aid in the creation of innovative strategies that lessen the incidence of obesity and chronic illness.

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