The Juvenile Obesity Epidemic: Strike Back with Physical Activity

Oded Bar-Or, M.D.
Professor of Pediatrics
Director, Children’s Exercise & Nutrition Centre
McMaster University
Hamilton, Ontario
Canada

KEY POINTS

- The prevalence of juvenile obesity is on the rise in many developed and undeveloped countries. It has reached epidemic proportions.
- A reduction in physical activity, mostly due to increased “screen time” (TV, Internet, computer games, video), is an important likely cause of this epidemic.
- Enhanced physical activity induces several beneficial effects on the health and well-being of obese children and adolescents. Less information is available regarding its effectiveness in the prevention of juvenile obesity.
- Several published sets of guidelines are available regarding the amount, frequency, intensity and nature of activities suitable for the general population of children and youth. However, the validation of these guidelines requires further research.

INTRODUCTION

Determining who is overweight and who is obese
The terms “overweight” and “obesity” are often used as if they are synonymous, but they are not. Both denote excessive body weight, but obesity is a more advanced state than is overweight. The definitions and criteria of obesity depend to a great extent on the method used to determine it. Ideally, one should measure or assess percent body fat by determining skinfold thickness or underwater weight or by using techniques of dual energy X-ray absorptiometry (DEXA). Body fat in excess of 30% is often used as a criterion for obesity.

In the absence of tools to estimate percent body fat, one must resort to the simpler measurements of body weight and height. The most commonly used index of overweight and obesity, based on weight and height, is the Body Mass Index (BMI = weight (kg) divided by height squared (m²)). For adults, a BMI of 25-29 kg/m² denotes overweight, and a BMI of 30 kg/m² or more denotes obesity. These cutoff points, however, are not valid for children and adolescents. Based on data of more than 97,000 subjects from various countries, the cutoff levels for adolescents are lower than for adults, and they are even lower in children (Cole et al., 2000). For example, the obesity cutoff level for a 15-year-old boy is 28 kg/m², and for an 8-year-old boy it is 23 kg/m². The corresponding cutoff points for overweight are 23 and 18 kg/m² respectively.

In spite of the popularity of BMI, one must realize that it does not differentiate between a person whose excessive body weight is due to high body fat content and one whose excess bodyweight is attributed to a large fat-free mass. This drawback is particularly relevant for athletes, who may vary markedly in their muscle bulk and fat-free mass. For such people, one should attempt a measurement of percent body fat.

The purpose of this article is to concisely describe the recent rapid increase in obesity among children and adolescents, to summarize the results of investigations that have studied the potential causes of the epidemic in juvenile obesity, and to briefly discuss approaches to the prevention and treatment of this disease. Most of the studies that report an increase in the prevalence of obesity used BMI data to assess obesity.

RESEARCH REVIEW

The juvenile obesity epidemic
The last three decades have seen a dramatic surge in the prevalence of juvenile obesity. (In this article “juvenile” is used collectively for children and adolescents.) For example, as seen in Table 1, the prevalence of juvenile obesity and overweight in the US increased dramatically from 1965 to 1995. The increase was faster in boys than in girls.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age Group (years)</th>
<th>% Increase in Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>6-11</td>
<td>106</td>
</tr>
<tr>
<td>Girls</td>
<td>12-17</td>
<td>69</td>
</tr>
<tr>
<td>Boys</td>
<td>6-11</td>
<td>108</td>
</tr>
<tr>
<td>Boys</td>
<td>12-17</td>
<td>146</td>
</tr>
</tbody>
</table>

TABLE 1. Increase over 30 years in the prevalence of juvenile obesity, comparing data from the 1965 NHANES I and 1995 NHANES III national surveys in the US. Data from Troiano et al. (1995). Obesity was assessed according to BMI percentiles.
A nationwide Canadian study observed a major increase in the prevalence of obesity and overweight between 1993 and 1994 (Friedenreich & Colditz, 1998). Recent surveys also appear particularly daunting in the younger age groups. For example, among 11-16 year olds, over 17% of males and nearly 30% of females are overweight or obese (Braun et al., 2001). These surveys also indicate that the prevalence of obesity is increasing more rapidly among children than among those watching TV (Braun et al., 2001). Regarding the prevalence of obesity in girls, the Children’s Health Council of San Francisco, Recommended policies for obesity prevention and intervention. A special section in the site provides “Tools for Parents.”

Prominent for the Obese Child

...
A nationwide Canadian study showed a major increase in the prevalence of obesity and overweight between 1985–1994 and 1999–2000 (Bruch, 1940; Bullen et al., 1964; Dionne et al., 2000; Pate et al., 1995). Some authors concluded (Ferguson et al., 1999). However, these numbers are likely to be underestimated because they were based on self-report of height and weight, which may be subject to error. The actual prevalence of obesity may be higher. It is likely that the prevalence of obesity in Canada is not increasing at the same rate as in the US, but it is also likely that a substantial proportion of the population is becoming overweight, which may pose a serious health risk. In particular, the young and the elderly have a higher risk of developing obesity. Overweight and obesity are major public health problems in Canada, and there is a need to develop effective strategies to prevent and treat obesity.

Possible Causes for the Obesity Epidemic

Several factors may contribute to the increase in obesity and overweight. Dietary factors, physical activity, and sedentary behavior are the most important factors. Dietary factors include the consumption of high-calorie foods, especially those that are high in fat and sugar, and the consumption of foods that are high in refined carbohydrates. Physical activity is the opposite of sedentary behavior and can have a significant impact on weight management. Sedentary behavior, such as sitting for long periods of time, has been shown to be associated with an increased risk of obesity.

Dietary factors such as high-calorie foods and sedentary behavior are the most important factors in the development of obesity. These factors are closely related to the prevalence of obesity and overweight in North America. The increase in the prevalence of obesity and overweight in North America is a decline in energy expenditure and an increase in energy intake. This is consistent with the observation that the prevalence of obesity and overweight in Canada is higher than in other countries.

The causes of the current juvenile obesity epidemic are not yet fully understood. Some authors concluded (Ferguson et al., 1999). However, these numbers are likely to be underestimated because they were based on self-report of height and weight, which may be subject to error. The actual prevalence of obesity may be higher. It is likely that the prevalence of obesity in Canada is not increasing at the same rate as in the US, but it is also likely that a substantial proportion of the population is becoming overweight, which may pose a serious health risk. In particular, the young and the elderly have a higher risk of developing obesity. Overweight and obesity are major public health problems in Canada, and there is a need to develop effective strategies to prevent and treat obesity.

Reference


SUMMARY

The prevalence of obesity and overweight in North America is increasing. This may be due to increases in energy intake and decreases in energy expenditure. In particular, the younger age groups are at higher risk for developing obesity. The reasons for this increase are not yet fully understood. However, it is likely that a combination of dietary factors, physical activity, and sedentary behavior contribute to the development of obesity. It is important to develop effective strategies to prevent and treat obesity in children and youth.
Possible Causes for the Obesity Epidemic

The obesity epidemic is a cultural problem that is as much social as it is biological. The causes of obesity are complex and multifaceted, and they include genetic, environmental, and behavioral factors. Several studies have identified obesity as a significant social problem, and there is a growing consensus that it is a global public health crisis.

In the United States, the prevalence of obesity has been increasing rapidly over the past few decades. According to the Centers for Disease Control and Prevention (CDC), the prevalence of obesity among adults aged 20 and older was 39% in 2019. The prevalence of obesity among children and adolescents aged 2-19 years was 18.3% in 2019.

Several factors contribute to the obesity epidemic. These factors include an increase in sedentary behavior, a decrease in physical activity, and an increase in energy-dense food intake. The rise in obesity rates is also associated with changes in the food environment, where fast food and highly processed foods are more readily available.

Several studies have shown that there is a strong correlation between obesity and the amount of screen time. For example, a study published in the Journal of the American Medical Association (JAMA) found that children who spent more time watching TV were more likely to be obese than those who spent less time watching TV.

In addition to screen time, other factors such as dietary habits, sedentary lifestyle, and genetic predisposition also play a role in the development of obesity. The role of genetics in obesity is not yet fully understood, but there is evidence to suggest that a genetic component may exist.

Several studies have shown that there is a strong correlation between obesity and the amount of screen time. For example, a study published in the Journal of the American Medical Association (JAMA) found that children who spent more time watching TV were more likely to be obese than those who spent less time watching TV.

In addition to screen time, other factors such as dietary habits, sedentary lifestyle, and genetic predisposition also play a role in the development of obesity. The role of genetics in obesity is not yet fully understood, but there is evidence to suggest that a genetic component may exist.

Several studies have shown that there is a strong correlation between obesity and the amount of screen time. For example, a study published in the Journal of the American Medical Association (JAMA) found that children who spent more time watching TV were more likely to be obese than those who spent less time watching TV.

In addition to screen time, other factors such as dietary habits, sedentary lifestyle, and genetic predisposition also play a role in the development of obesity. The role of genetics in obesity is not yet fully understood, but there is evidence to suggest that a genetic component may exist.

Several studies have shown that there is a strong correlation between obesity and the amount of screen time. For example, a study published in the Journal of the American Medical Association (JAMA) found that children who spent more time watching TV were more likely to be obese than those who spent less time watching TV.

In addition to screen time, other factors such as dietary habits, sedentary lifestyle, and genetic predisposition also play a role in the development of obesity. The role of genetics in obesity is not yet fully understood, but there is evidence to suggest that a genetic component may exist.

Several studies have shown that there is a strong correlation between obesity and the amount of screen time. For example, a study published in the Journal of the American Medical Association (JAMA) found that children who spent more time watching TV were more likely to be obese than those who spent less time watching TV.

In addition to screen time, other factors such as dietary habits, sedentary lifestyle, and genetic predisposition also play a role in the development of obesity. The role of genetics in obesity is not yet fully understood, but there is evidence to suggest that a genetic component may exist.

Several studies have shown that there is a strong correlation between obesity and the amount of screen time. For example, a study published in the Journal of the American Medical Association (JAMA) found that children who spent more time watching TV were more likely to be obese than those who spent less time watching TV.

In addition to screen time, other factors such as dietary habits, sedentary lifestyle, and genetic predisposition also play a role in the development of obesity. The role of genetics in obesity is not yet fully understood, but there is evidence to suggest that a genetic component may exist.
The purpose of this article is to concisely describe the epidemic of juvenile obesity in the United States and other Western countries, to summarize the major epidemiological features of this disorder, to discuss the etiology of obesity in children and adolescents, to review the latest research on interventions designed to prevent and treat childhood obesity, and to consider the role of parents, schools, health professionals, and community leaders in the prevention and treatment of this disorder. Most of the studies that report an increase in the prevalence of obesity used BMI data to assess obesity.

**RESEARCH REVIEW**

To describe a dynamical system in the prevalence of juvenile obesity during the last 30 years, we used the database in Table 1 and plotted the data in a graph to show the changes in prevalence over different time periods. The prevalence of obesity in children and adolescents is increasing in many developed and developing countries. It has reached epidemic proportions.

**KEY POINTS**

1. The prevalence of juvenile obesity is on the rise in many developed and developing countries. It has reached epidemic proportions.
2. Overweight and obesity are often used as if they are synonymous, but they are not. Both denote excess body weight.
3. The terms “overweight” and “obesity” are often used as if they are synonymous, but they are not. Both denote excess body weight.
4. The last three decades have seen a dramatic surge in the prevalence of obesity used BMI data to assess obesity.

**INTRODUCTION**

The juvenile obesity epidemic is a phenomenon that has become a defining feature of childhood and adolescence in many parts of the world. Although the prevalence of obesity in children and adolescents has increased in both developed and developing countries, the epidemic began in the United States in the 1980s and has since spread globally. The juvenile obesity epidemic is a public health crisis that affects both children and adults. It is considered one of the most important global health challenges of the 21st century.

**Terms “overweight” and “obese”**

The terms “overweight” and “obese” are often used as if they are synonymous, but they are not. Both denote excess body weight. Ideally, one should measure or assess percent body fat as the endpoint of any intervention designed to prevent and treat obesity. In adults, body fat can be measured directly using underwater weighing, bioelectrical impedance analysis, or dual-energy X-ray absorptiometry. In children, body fat can be estimated using skinfold thickness measurements or impedance measurements.

**Enhanced physical activity**

Enhanced physical activity involves several beneficial effects on the body, including increased bone mineral density, increased vascular health, and increased insulin sensitivity. Several published guidelines of physical activity are available regarding the amount and intensity of activity necessary for children and adolescents. Most of the studies that report an increase in the prevalence of obesity used BMI data to assess obesity.

**RESEARCH REVIEW**

To describe a dynamical system in the prevalence of juvenile obesity during the last 30 years, we used the database in Table 1 and plotted the data in a graph to show the changes in prevalence over different time periods.
adolescents.


Sorensen, M.S. (2001). Exercise as a modality in the treat-


te


