

Increases of Obesity and Overweight in Children: an Alarm for Parents and Policymakers

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Abstract

Childhood obesity is one of the most serious public health challenges of the 21st century. The problem is global and is steadily affecting many low- and middle-income countries, particularly in urban settings. The prevalence has increased at an alarming rate. Globally, in 2013 the number of overweight children under the age of five years old, is estimated to be over 42 million. Close to 31 million of these are living in developing countries. In the WHO African Region alone the number of overweight or obese children increased from 4 to 9 million over the same period. The vast majority of overweight or obese children live in developing countries, where the rate of increase has been more than 30% higher than that of developed countries. If current trends continue the number of overweight or obese infants and young children globally will increase to 70 million by 2025. Without intervention, obese infants and young children will likely continue to be obese during childhood, adolescence and adulthood. Overweight and obesity are largely preventable. Supportive policies, environments, schools and communities are fundamental in shaping parents' and children's choices, making the healthier choice of foods and regular physical activity the easiest choice (accessible, available and affordable), and therefore preventing obesity.

Key Words: Children, Obesity, Overweight, World Health Organization.

*Please cite this article as: Khadaee Gh, Saeidi M. Increases of Obesity and Overweight in Children: an Alarm for Parents and Policymakers. Int J Pediatr 2016; 4(4): 1591-1601.

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Received date: Dec 11, 2015 Accepted date: Feb 12, 2016

1- INTRODUCTION (1, 2)

Obesity is defined as abnormal or excessive fat accumulation that may impair health. In infants and children under 5 years of age obesity is assessed according to the WHO "Child growth standards" (weight-for-length, weight-for-height) and the WHO Reference for 5-19 years (body mass index-for-age). In 2013, 42 million infants and young children were overweight or obese, worldwide¹ and 70 million young children will be overweight or obese by 2025 if current trends continue. Without intervention, overweight infants and young children will likely continue to be overweight during childhood, adolescence and adulthood. Obesity in childhood is associated with a wide range of serious health complications and an increased risk of premature onset of illnesses, including diabetes and heart disease.

1-1. Ten facts on obesity (3)

Obesity has reached epidemic proportions globally, with at least 2.8 million people dying each year as a result of being overweight or obese. Once associated with high-income countries, obesity is now also prevalent in low- and middle-income countries.

Governments, international partners, civil society, non- governmental organizations and the private sector all have vital roles to play in contributing to obesity prevention.

1-1-1. Overweight and obesity are defined as "abnormal or excessive fat accumulation that may impair health".

Body mass index (BMI) – the weight in kilograms divided by the square of the height in meters (kg/m²) – is a commonly used index to classify overweight and obesity in adults. WHO defines overweight as a BMI equal to or more than 25, and obesity as a BMI equal to or more than 30.

1-1-2. More than 1.4 billion adults were overweight in 2008, and more than half a billion obese

In 2008, more than 1.4 billion adults were overweight and more than half a billion were obese. At least 2.8 million people each year die as a result of being overweight or obese. The prevalence of obesity has nearly doubled between 1980 and 2008. Once associated with high-income countries, obesity is now also prevalent in low- and middle-income countries.

1-1-3. Globally, 42 million preschool children were overweight in 2013

Childhood obesity is one of the most serious public health challenges of the 21st century. Overweight children are likely to become obese adults. They are more likely than non-overweight children to develop diabetes and cardiovascular diseases at a younger age, which in turn are associated with a higher chance of premature death and disability.

1-1-4. Overweight and obesity are linked to more deaths worldwide than underweight

65% of the world's population who live in a country where overweight and obesity kills more people than underweight. This includes all high-income and middle-income countries. Globally, 44% of diabetes, 23% of ischaemic heart disease and 7–41% of certain cancers are attributable to overweight and obesity.

1-1-5. For an individual, obesity is usually the result of an imbalance between calories consumed and calories expended

An increased consumption of highly calorific foods, without an equal increase in physical activity, leads to an unhealthy increase in weight. Decreased levels of physical activity will also result in an energy imbalance and lead to weight gain.

1-1-6. Supportive environments and communities are fundamental in shaping people's choices and preventing obesity

Individual responsibility can only have its full effect where people have access to a healthy lifestyle, and are supported to make healthy choices. WHO mobilizes the range of stakeholders who have vital roles to play in shaping healthy environments and making healthier diet options affordable and easily accessible.

1-1-7. Children's choices, diet and physical activity habits are influenced by their surrounding environment

Social and economic development as well as policies in the areas of agriculture, transport, urban planning, environment, education, food processing, distribution and marketing influence children's dietary habits and preferences as well as their physical activity patterns. Increasingly, these influences are promoting unhealthy weight gain leading to a steady rise in the prevalence of childhood obesity.

1-1-8. Eating a healthy diet can help prevent obesity

People can:

- 1) maintain a healthy weight
- 2) limit total fat intake and shift fat consumption away from saturated fats to unsaturated fats
- 3) increase consumption of fruit, vegetables, pulses, whole grains and nuts
- 4) limit the intake of sugar and salt.

1-1-9. Regular physical activity helps maintain a healthy body

People should engage in adequate levels of physical activity throughout their lives. At least 30 minutes of regular, moderate-intensity physical activity on most days reduces the risk of cardiovascular disease, diabetes, colon cancer and breast cancer. Muscle strengthening and balance training can reduce falls and improve mobility

among older adults. More activity may be required for weight control.

1-1-10. Curbing the global obesity epidemic requires a population-based multisectoral, multi-disciplinary, and culturally relevant approach

WHO's Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases provides a roadmap to establish and strengthen initiatives for the surveillance, prevention and management of noncommunicable diseases, including obesity.

2- MATERIALS AND METHODS

2-1. Literature Search

The following databases were searched for relevant papers and reports: MEDLINE, CINAHL, WHO website, United Nations Children's Fund (UNICEF) and United Nations (UN) website, Embase, Cochrane Collection, Google Scholar, Pubmed, Islamic databases and ISI Web of Science. Key references from extracted papers were also hand-searched.

2-2. Search Terms

To evaluate the texts and websites, the singular or combination forms of the following keywords were used to search for the relevant literature: "Children", "Childhood", "Obesity", "Worldwide", and "Overweight".

3- RESULTS (1, 3)

- Worldwide obesity has more than doubled since 1980.
- The worldwide prevalence of obesity more than doubled between 1980 and 2014.
- Most of the world's population who live in countries where overweight and obesity kills more people than underweight.
- 42 million children under the age of 5 were overweight or obese in 2013.

- Obesity is preventable.

The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally, there has been:

- an increased intake of energy-dense foods that are high in fat; and
- an increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization.

Changes in dietary and physical activity patterns are often the result of environmental and societal changes associated with development and lack of supportive policies in sectors such as health, agriculture, transport, urban planning, environment, food processing, distribution, marketing and education(1, 3).

3-1. Measuring overweight and obesity (4)

It is difficult to develop one simple index for the measurement of overweight and obesity in children and adolescents because their bodies undergo a number of physiological changes as they grow. Depending on the age, different methods to measure a body's healthy weight are available:

3-1-1. For children aged 0-5 years

The WHO Child Growth Standards, launched in April 2006, include measures for overweight and obesity for infants and young children up to age 5.

3-1-2. For individuals aged 5-19 years

WHO developed the Growth Reference Data for 5-19 years old. It is a reconstruction of the 1977 National Center for Health Statistics (NCHS)/WHO reference and uses the original NCHS data set supplemented with data from the WHO

child growth standards sample for young children up to age 5.

3-1-3. for Adults

The most commonly used measure for overweight and obesity is the Body Mass Index (BMI) - a simple index to classify overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m²). The BMI provides the most useful population-level measure of overweight and obesity, as it is the same for both sexes and for all ages of adults. However, it should be considered as a rough guide because it may not correspond to the same body fat percentage in different individuals.

3-2. What are the health consequences of obesity in childhood? (1, 5- 9)

Obese infants and children are likely to continue being obese during adulthood and are more likely to develop a variety of health problems as adults. These include:

- cardiovascular disease
- insulin resistance (often an early sign of impending diabetes)
- musculoskeletal disorders (especially osteoarthritis - a highly disabling degenerative disease of the joints)
- some cancers (endometrial, breast and colon)
- disability.

Supportive policies, environments, schools and communities are fundamental in shaping parents' and children's choices, making the healthier choice of foods and regular physical activity the easiest choice (accessible, available and affordable), thereby preventing obesity.

3-2-1. for infants and young children, WHO recommends:

- early initiation of breastfeeding within one hour of birth;
- exclusive breastfeeding for the first 6 months of life; and
- the introduction of nutritionally-adequate and safe complementary (solid) foods at 6 months together with continued breastfeeding up to two years of age or beyond.

3-2-2. School-aged children and adolescents should:

- limit energy intake from total fats and sugars;
- increase consumption of fruit and vegetables, as well as legumes, whole grains and nuts;
- engage in regular physical activity (60 minutes a day).

3-2-3. the food industry can play a significant role in reducing childhood obesity by:

- reducing the fat, sugar and salt content of complementary foods and other processed foods;
- ensuring that healthy and nutritious choices are available and affordable to all consumers;
- practicing responsible marketing especially those aimed at children and teenagers.

3-3. How can overweight and obesity be reduced? (1, 10-16)

Overweight and obesity, as well as their related non-communicable diseases, are largely preventable. Supportive environments and communities are fundamental in shaping people's choices, making the healthier choice of foods and regular physical activity the easiest choice (accessible, available and affordable), and therefore preventing obesity.

3-3-1. at the individual level, people can:

- limit energy intake from total fats and sugars;
- increase consumption of fruit and vegetables, as well as legumes, whole grains and nuts;
- engage in regular physical activity (60 minutes a day for children and 150 minutes per week for adults).

Individual responsibility can only have its full effect where people have access to a healthy lifestyle. Therefore, at the societal level it is important to:

- support individuals in following the recommendations above, through sustained political commitment and the collaboration of many public and private stakeholders;
- make regular physical activity and healthier dietary choices available, affordable and easily accessible to all - especially the poorest individuals.

3-3-2. The food industry can play a significant role in promoting healthy diets by:

- reducing the fat, sugar and salt content of processed foods;
- ensuring that healthy and nutritious choices are available and affordable to all consumers;
- practicing responsible marketing especially those aimed at children and teenagers;
- ensuring the availability of healthy food choices and supporting regular physical activity practice in the workplace.

4- DISCUSSION

4-1. Why does childhood overweight and obesity matter?

4-1-1. Consequences of an unhealthy lifestyle during childhood (1, 10-14)

Childhood obesity is associated with a higher chance of premature death and

disability in adulthood. Overweight and obese children are more likely to stay obese into adulthood and to develop non-communicable diseases (NCDs) like diabetes and cardiovascular diseases at a younger age. For most NCDs resulting from obesity, the risks depend partly on the age of onset and on the duration of obesity. Obese children and adolescents suffer from both short-term and long-term health consequences.

The most significant health consequences of childhood overweight and obesity, that often do not become apparent until adulthood, include:

- cardiovascular diseases (mainly heart disease and stroke);
- diabetes;
- musculoskeletal disorders, especially osteoarthritis; and
- certain types of cancer (endometrial, breast and colon).

4-1-2. Double Burden: a serious risk

Many low- and middle-income countries are now facing a "double burden" of disease: as they continue to struggle with the problems of infectious diseases and under-nutrition; at the same time they are experiencing a rapid increase in risk factors of NCDs such as obesity and overweight, particularly in urban settings.

It is not uncommon to find under-nutrition and obesity existing side-by-side within the same country, the same community and even within the same household in these settings.

This double burden is caused by inadequate pre-natal, infant and child nutrition which is then followed by exposure to high-fat, energy-dense, micronutrient-poor foods and a lack of physical activity as the child grows older.

4-2. What are the causes? (13-20)

4-2-1. Reasons for children and adolescents to become obese

The fundamental cause of childhood overweight and obesity is an energy imbalance between calories consumed and calories expended.

Global increases in childhood overweight and obesity are attributable to a number of factors including:

- A global shift in diet towards increased intake of energy-dense foods that are high in fat and sugars but low in vitamins, minerals and other healthy micronutrients;
- A trend towards decreased physical activity levels due to the increasingly sedentary nature of many forms of recreation time, changing modes of transportation, and increasing urbanization.

4-2-2. Societal reasons for the childhood obesity epidemic

WHO recognizes that the increasing prevalence of childhood obesity results from changes in society. Childhood obesity is mainly associated with unhealthy eating and low levels of physical activity, but the problem is linked not only to children's behaviour but also, increasingly, to social and economic development and policies in the areas of agriculture, transport, urban planning, the environment, food processing, distribution and marketing, as well as education.

The problem is societal and therefore it demands a population-based multisectoral, multi-disciplinary, and culturally relevant approach. Unlike most adults, children and adolescents cannot choose the environment in which they live or the food they eat. They also have a limited ability to understand the long-term consequences of their behaviour. They therefore require

special attention when fighting the obesity epidemic.

4-3. What can be done to fight the childhood obesity epidemic?

Overweight and obesity, as well as related non-communicable diseases, are largely preventable. It is recognized that prevention is the most feasible option for curbing the childhood obesity epidemic since current treatment practices are largely aimed at bringing the problem under control rather than effecting a cure. The goal in fighting the childhood obesity epidemic is to achieve an energy balance which can be maintained throughout the individual's life-span.

4-3-1. General recommendations:

- increase consumption of fruit and vegetables, as well as legumes, whole grains and nuts;
- limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats;
- limit the intake of sugars; and
- be physically active - accumulate at least 60 minutes of regular, moderate- to vigorous-intensity activity each day that is developmentally appropriate.

4-3-2. Global Strategy on Diet, Physical Activity and Health (1, 3, 21-33)

4-3-2-1. The role of parents

The promotion of healthy diets and regular, adequate physical activity are major factors in fighting the childhood obesity epidemic.

In making healthy foods and beverages available at home and in providing, supporting and encouraging opportunities for physical activity, parents can influence their children's behavior.

Simultaneously parents are advised to live and promote a healthy lifestyle because children's behavior is often shaped by observation and adaptation.

Suggestions for the promotion of healthy nutrition at home

4-3-2-1-1. For infants and young children:

- breastfed exclusively for the first six months of life;
- continuously breastfed until 2 years and beyond, complemented with a variety of adequate, safe and nutrient dense complementary foods;
- avoid the use of added sugars and starches when feeding formula;
- accept the child's ability to regulate energy intake rather than feeding until the plate is empty;
- assure the appropriate micronutrient intake needed to promote optimal linear growth.

4-3-2-1-2. For children and adolescents:

- provide healthy breakfast before each school day;
- serve healthy school snacks to children (whole-grain, vegetables, fruits);
- promote intake of fruits and vegetables;
- restrict intake of energy-dense, micronutrient-poor foods (e.g. packaged snacks);
- restrict intake of sugars-sweetened soft drinks;
- ensure opportunity for family meals;
- limit exposure to marketing practices (e.g. limit television-viewing);
- teach children to resist temptation and marketing strategies;
- provide information and skills to make healthy food choices.

Suggestions for the promotion of physical activity at home

- reduce non-active time (e.g. television viewing, computer);
- encourage safe walking/bicycling to school and to other social activities;
- make physical activity part of the family's daily routine such as designating time for family walks or playing active games together;
- ensure that the activity is age appropriate and provide protective equipment such as helmets, wrist pads, and knee pads.

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4-3-2-2. The role of schools

The promotion of healthy diets and physical activity in school is essential to fight the childhood obesity epidemic. Because children and adolescents spend a significant time of their young lives in school, the school environment is an ideal setting to acquire knowledge and skills about healthy choices and to increase physical activity levels.

Suggestions to promote physical activity in schools

- offer daily physical education classes with a variety of activities,

so that the maximum number of students' needs, interests and abilities are addressed;

- offer extracurricular activities: school sports and non-competitive school programmes (e.g. active recess);
- encourage safe, non-motorized modes of transportation to school and other social activities;
- provide access to adequate physical activity facilities to students and the community;
- encourage students, teachers, parents and the community to become physically active.

5- CONCLUSION (1, 4, 14, 34-40)

From 1980 to 2013, the prevalence of overweight and obesity in children increased by nearly 50%. Currently 10% of children worldwide are either overweight or obese. In 2014, WHO established a high-level commission to end childhood obesity. Every aspect of the environment in which children are conceived, born and raised can contribute to their risk of becoming overweight or obese. During pregnancy, gestational diabetes (a form of diabetes occurring during pregnancy) may result in increased birth weight and risk of obesity later in life. Choosing healthy foods for infants and young children is critical because food preferences are established in early life. Feeding infants energy-dense, high-fat, high-sugar and high-salt foods is a key contributor to childhood obesity. Lack of information about sound approaches to nutrition and poor availability and affordability of healthy foods contribute to the problem. The aggressive marketing of energy-dense foods and beverages to children and families further exacerbate it. In some societies, longstanding cultural norms (such as the widespread belief that a fat baby is a healthy baby) may encourage families to over-feed their children. The

increasingly urbanized and digitalized world offers fewer opportunities for physical activity through healthy play. Being overweight or obese further reduces children's opportunities to participate in group physical activities. They then become even less physically active, which makes them likely to become more overweight over time.

5-1. Prevention of childhood obesity

5-1-1. For infants and young children, WHO recommends:

- ❖ early initiation of breastfeeding within one hour of birth;
- ❖ exclusive breastfeeding for the first 6 months of life; and
- ❖ the introduction of nutritionally-adequate and safe complementary (solid) foods at 6 months together with continued breastfeeding up to two years of age or beyond.

Complementary foods should be rich in nutrients and given in adequate amounts. At six months, caregivers should introduce foods in small amounts and gradually increase the quantity as the child gets older. Young children should receive a variety of foods including meat, poultry, fish or eggs as often as possible. Foods for the baby can be specially prepared or modified from family meals. Complementary foods high in fats, sugar and salt should be avoided.

5-1-2. School-aged children and adolescents should:

- ❖ limit energy intake from total fats and sugars;
- ❖ increase consumption of fruit and vegetables, as well as legumes, whole grains and nuts;
- ❖ engage in regular physical activity (60 minutes a day).

5-1-3. The food industry can play a significant role in reducing childhood obesity by:

- ❖ reducing the fat, sugar and salt content of complementary foods and other processed foods;
- ❖ ensuring that healthy and nutritious choices are available and affordable to all consumers;
- ❖ practicing responsible marketing especially those aimed at children and teenagers.

6- CONFLICT OF INTEREST: None.

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