

# Child Obesity

By Dr. Richard Visser and other authors

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## Introduction

Obesity is the culmination of high fat to the normal quantities in relation to age, height, and sex in a specific individual<sup>1,2</sup> that results in the existence of a positive energetic balance that is prolonged during an extended period of time. Obesity has repercussions, which are manifested in many different subsystems of the body. Many specialists generally mention this condition as the metabolic syndrome<sup>3,4</sup> which include besides obesity, high cholesterol, hypertriglyceridemia, elevated LDL and VLDL, decreased HDL, hyperuricemia and increased resistance to insulin<sup>5</sup>. Therefore, it is a unique disease, on the other hand it is accepted that it is a heterogeneous group of diseases associated with repercussions of death and mortality through high incidence of type II diabetes<sup>6</sup>, arterial hypertension, vascular brain disease<sup>7</sup>, cardiovascular disease<sup>8</sup>, some types of cancer<sup>9</sup> and obstructive apnea of sleep<sup>10</sup>, among others.

In this research we expose the results of a bibliographic revision (see bibliography) about child obesity. We strive to alert the public and increase awareness about the dangers of child obesity, and to reduce this obesity quickly. Obesity and its complications are manifesting themselves now more than ever among children.

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## Development

Obesity in children and adolescents is the first cause of maintained hypertension and also of vascular complications among young adults, in addition of being an important risk factor of the existence of obese adults due to the formation during those ages of a high number of deposits that facilitate the deposit of fats<sup>11,12</sup>.

Excessive weight in children and teenagers contributes to orthopedic deformities, reduction of physical activity and distortion of the physical appearance that can affect self-esteem, interpersonal relationships and social projection<sup>13</sup>.

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Obesity is a pandemic that affects the different groups of diets without distinction of race and gender<sup>14</sup>. In developing countries it is one of the biggest sanitary prob-

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lems that is informed in the scientific literature in recent years<sup>15,16,17,18</sup> and also in underdeveloped countries it can be present with a high prevalence together with malnutrition.<sup>19,20,21,22</sup>

The prevalence of obesity is related to age, gender, race, educational background or socio-economic situation of the people affected<sup>23,24</sup>. This problem is produced by several causes that have relations with several factors. Obesity is classified as the primary cause when corresponding to external elements of the individual such as the one produced by the environment: and is classified as a secondary cause when corresponding to elements of the affected individual, such as genetic neuroendocrine diseases. In the cases that include various external and internal factors they are classified mixed obesity<sup>25</sup>.

Among the principal environmental factors associated with obesity we might find the relation between the ingestion of energy and the levels of physical activity<sup>26,27,28</sup>. It is accepted that the increase of physical activity heavily contributes to diminish or avoid obesity<sup>29,30,31,32,33</sup>. Several researchers state the existence of other predisposed environmental factors related to obesity such as early weaning the child from breastfeeding, insufficient use of maternal lactation, early ab lactating before the third month of life, if the child consumes less than one liter of milk per day. Also it is mentioned that bad habits are formed in the consumption of food, such as the lack of breakfast, consumption of large amounts of food in the late hours of the day, eating too quickly, ingestion of foods high in fat or simple sugars<sup>11,16,34</sup>. There are also other genetic factors that determine the capacity or facility that energy cumulates into fat tissue and is less likely to burn, which is classified as elevated energy efficiency of the obese individual<sup>31</sup>.

All alterations of the states of normal nutrition could be accompanied by functional, structural modification or both that might be detected in the body by method of clinical laboratory or both. Independent of its intensity, duration and lifespan, will be the magnitude of the detected modification and its reaction to the state of health.<sup>13,21</sup>

(Alternate translation of the above paragraph: Whenever a normal state of nutrition is changed, there is an effect on the structures and functions, or both, of the human body. No matter a person's will to live, it will be the magnitude of these changes in the body that will have repercussions on a person's quality of life).

The anthropometric studies allow detection of the morphologic transformations that are the result of alterations in size, structure and body composition that corresponds to a specific nutritional state. These might indicate risks to the health. The nutritional evaluation using anthropometry uses the simple body measurements such as weight, size, circumference or fat folds in relation with age and gender. It also employs the association of two body measurements, such as relation between size and weight or the circumference of the waist to hips. All of them produce what we call: Weight to age, weight to size, waist-hip circumference among



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others<sup>13,30,35,36</sup>.

In order to determine excessive fat in the body we use several methods. The more simple and cheapest are the ones used in relation to weight, size and weight age. With these methods only some exceptions could exclude body builders who have an excessive weight due to lean muscle tissue. In these particular cases we use the measurements of a fat pinch test and measurements of some anatomic areas<sup>12</sup>. It is important to know the distribution of fat in the body as well because it is recognized that the superior distribution of it (known as android obesity) is a risk factor for suffering of cardiovascular diseases; on the other hand a small or inferior distribution (known as gynaecological obesity) produces vascular diseases of inferior members and gynaecological disturbances to accomplish this goal the waist to hips measurement method must be used<sup>35</sup>.

The layer of subcutaneous fat is not distributed evenly and therefore its thickness varies from one area to another. It is also important to consider the perimeter of the region where the fold is formed, for instance, with equal amounts of triceptal folds, this might have more fat than a person with a bigger perimeter of arm. In order to obtain a more precise estimation closer to the reality it is possible to add the three fat folds, triceptal, subscapular and supra iliacus, as a weight of estimation of the amount of fat in the individual. There are equations through which you employ two or more fat folds to estimate the percentage of body fat. These equations have been elaborated by using body measurements in individuals whose percentage of body fat in relation to the hydrostatic weight have been calculated<sup>12,13</sup>.

The ratio between the circumference of the waist and the circumference of the hips has been used more often in the calculation of relative increase of the abdominal fat in order to detect people with high risk. Values have been established using this proportion with the circumference of the waist that indicate increased risk of suffering from diabetes, nondependent insuline diabetics, high lipid producing, arterial hypertension and coronary abnormalities among other diseases. The relation between the waist/hip ratio or the circumference of the waist and the distribution of the central fat, such as subcutaneous or intra abdominal, has been studied among men and women, finding that they are highly related to the hip/waist ratio and the circumference of the waist with the intra abdominal fat. The intra abdominal fat represents a physiological response different to the subcutaneous fat which makes it more sensible to the lipid stimulus, mechanisms through which the free fat acid increase in the portal circulation; these things are the point of origin for physiopathologic processes that facilitate the appearance of diseases and infections being appointed<sup>13</sup>.

In addition of the anthropometric investigations it is necessary to investigate the level of physical activity, energy expenditure and its relation with the ingested energy to prove the energetic balance of the individual<sup>15,22</sup>.

According to the type of investigation and the number of individuals studied, sev-

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eral determinations are stated<sup>36</sup>. The level of physical activity could be determined using ergometric movement sensors; Although it is possible to determine using the time movement method which is more economic and is easy to apply. The total energetic expenditure could be measured using different methods such as water doubling mark with stable isotopes; but the cost is very high and the complexity of execution only can be conducted (that is why it is only done in few people) on investigations in a reduced number of individuals. The energetic ingestion can be possible to determine recording the ingestion of food at different times or by methods of weighing foods.

Also, throughout this study, laboratory investigations were conducted in order to obtain information of the nutritional state. Among these we can find the lipogram study, a glucose tolerance test, albumin serum, proteins, hemoglobin, the total amount of leucocytes<sup>13</sup>.

The prognosis of child obesity depends on what actions are taken to prevent it, and it is a challenge for the therapies due to the high number of failures that are reported on these treatments. It is accepted that child obesity is treated using different branches of medicine, pediatricians, nutritionists, dietitians, psychologists, social commentators and teachers among other professionals that work together in order to modify the dietary habits and lifestyles and other factors<sup>37,38,39,40</sup>.

Many people do not consider the secondary consequences of losing weight. Various studies have shown that with the reduction of fat in the body can contribute to the normalization of blood pressure, the lipidogram and glucose tolerance<sup>41</sup>.

In the dietary treatment against child and adolescence obesity the nutritional needs for the patients growth and development must be considered, to obtain a gradual change from fat tissue to lean tissue; that is why it is so dangerous to use extreme diets. The diets must correspond with the ideal weight of the patient based on his age and gender<sup>42</sup>.

The best options on health care are the preventive ones where the education of the public constitutes the most important aspect against this pandemic disease<sup>43,44,45</sup>. The educational campaigns must be focused in order to obtain a correct nutrition with good food habits and healthy lifestyles where physical activity must be sufficient and appropriate<sup>46,47,48,49,50,51,52,53,54,55</sup>.

Studies done in the Caribbean discovered high proportions of obesity among the adult population, bad food habits, lack of physical activity and a medical history of obesity as a child<sup>57</sup>. It was also found that one out of four children don't do physical activities outside of school, one out of five children don't have a healthy breakfast, one out of two children don't eat fruits, two out of three children don't eat vegetables, and one out of two children consume high proportions of fried foods<sup>58</sup>.

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To these results we have to add the problem of not perceiving the high risk of obesity among the people of the Caribbean countries because being overweight is valued as a manifestation of wealth and beauty.

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### Final considerations

The prevalence of child obesity represents a marked increase in affecting the health of children, besides risking their health in the future when they become adults; therefore we should act as soon as possible and in an efficient way to reduce it. This means to diagnose early the disease and find ways of implementing holistic prevention programs where we can involve the maximum number of resources available in our society.

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