

# Information System of Suitable Diet for Children's Health Based on Website

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**Abstract** - Nowadays, people give more attention to their health including their food intake. People who maintain a healthy weight throughout life tend to stay healthier and live longer. The lifestyle habits that help keep us slim exercise and a healthy diet also cut our risk of diabetes, heart disease, high blood pressure, and certain cancers. Despite, Too many children today have a reduced life expectancy and a diminished overall quality of life due to excess weight. Childhood obesity can lead to certain cardiovascular risk factors such as hypertension, high cholesterol, and abnormal glucose tolerance or diabetes. The Centers for Disease Control and Prevention recently found that 70 percent of obese children had at least one additional cardiovascular risk factor for heart disease, such as raised blood pressure or insulin levels, while 30 percent presented two or more additional risk factors. The road to lifelong good health begins with healthful eating and plenty of exercise. Getting children started on this path is easy with a little assistance. An information system base on internet is guided to help children getting an ideal health goals which is suitable with their body needs, and including up-to-date nutrition information. To knows child's body condition, in this website can input their data (body weight, age and height) and know their nutrition requirements. Moreover, this website will provide some random daily food menus and

activity to advice which are suitable for them.

**Keywords** - Children's Health, Information System, Obesity, Suitable Diet, Website

## 1. INTRODUCTION

According to recent statistics on obesity made by the World Health Organization (WHO), over 1.6 billion adults worldwide are overweight and another 400 million are obese. Being overweight can cause many health problems. These health problems caused by being overweight are directly related to one of the highest causes of death. A 2007 study was done by the Centers for Disease Control and Prevention (CDC), shows that heart disease is the number one cause of death killing 616,067, Cancer: 562,875, Stroke (cerebrovascular diseases): 135,952, and Diabetes: 71,382 [1].

The reports from the International Obesity Task Force (IASO) said that there are 155 million children around the world who are overweight including 30-45 million children obesity issues. Childhood obesity can lead to certain cardiovascular risk factors such as hypertension, high cholesterol, and abnormal glucose tolerance or diabetes. The Centers for Disease Control and Prevention (CDC) recently found that 70 percent of obese children had at least one additional cardiovascular risk factor for heart disease, such as raised blood pressure or insulinlevels, while 30 percent presented two

or more additional risk factors.

Research shows a direct association between the amount of excess weight in childhood and cancer risk in adulthood. For every one-point increase in body mass index, there is a 9 percent increase in adult cancer risk. Therefore, the more overweight a child is, the greater his or her risk of developing cancer is later on [6]. The road to lifelong good health begins with healthful eating and plenty of exercise. Childhood nutrition should be a balance between the high energy and nutrient content required for growth and development and establishing a healthy diet with weight control. According to Healthy Children Healthy Futures [5], the three keys for healthy eating. Eat a moderate amount of food, eating a wide variety of nutrient-rich foods, and balance what they eat and the physical activity.

#### **A. Nutrition for Children**

It would seem very necessary that children be provided with an adequate amount of energy. In particular, the macronutrients contained in foods that can provide children with energy are fats, carbohydrates and proteins. Proteins are essential for human cells. Excellent sources of high-quality proteins are animal liver, meat, fish, cheese, milk and eggs and some products of vegetable-origin, such as products derived from soybeans, green beans and legumes. Products derived from wheat also constitute a source of protein, but the majority of vegetables and fruits contain only a limited amount.

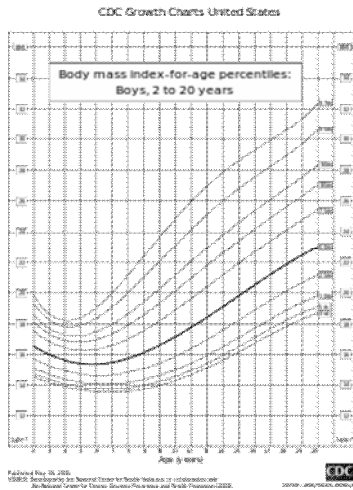
The second macronutrient essential for guaranteeing a correct and balanced energy level for children is fats. Fats consumed in the diet represent for children a source of energy and essential fatty acids. Structural fats are an essential part of the cell membrane, neural fabric and overall cellular structure, while stored fats-present especially in adipose tissue, primarily composed of triglycerides-provide a long-term energy reserve for the body. Carbohydrates are the third and most important source of energy (in terms of quantity) for the body.

Carbohydrates (sugars, starches and fiber) provide energy to all tissues in the human body, especially the brain and red blood cells which normally utilize glucose as the “fuel” for cell activity. Alongside the main macronutrients, other essential elements in a proper diet for preschool and school-age children are vitamins and minerals. In small children, an adequate supply of vitamin A is necessary for correct development of vision, to guarantee the integrity of epithelial tissue and development of tissue differentiation. The principal sources of vitamin A are: liver, dairy products, eggs, fish, margarine and certain types of fruit and vegetables (for example, carrots and yellow/orange colored fruit). Like vitamin A, vitamin B plays a fundamental role in the growth of children, as well as their correct sustenance and development.

Vitamin C is a key to optimum functioning of the immune system and for collagen synthesis. In addition, vitamin C contains antioxidant properties and plays a significant support role in the process of iron absorption. Vitamin D plays an essential role in metabolizing calcium (stimulating its absorption in the intestine), muscle functioning, cell proliferation and maturation and correct functioning of the immune system. Other elements essential in the diet of pre-school and school-age children are minerals, specifically iron, calcium, magnesium, phosphorus, sodium, zinc and iodine [3].

#### **B. Body Mass Index (BMI)**

Body Mass Index (BMI) is a number calculated from weight and height. BMI is used differently for children. It is calculated the same way as for adults, but then compared to typical values for other children of the same age. After BMI is calculated for children and teens, the BMI number is plotted on the CDC BMI-for-age growth charts (for either girls or boys) to obtain a percentile ranking. Percentiles are the most commonly used indicator to assess the size and growth patterns of individual children in the United States [4].



**Fig 1.** CDC Growth Charts United States for 2-20 years

The percentile indicates the relative position of the child's BMI number among children of the same sex and age. The growth charts show the weight status categories used with children and teens (underweight, healthy weight, overweight, and obese).

BMI-for-age weight status categories and the corresponding percentiles are shown in the following table.

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

**C. Management of childhood obesity**

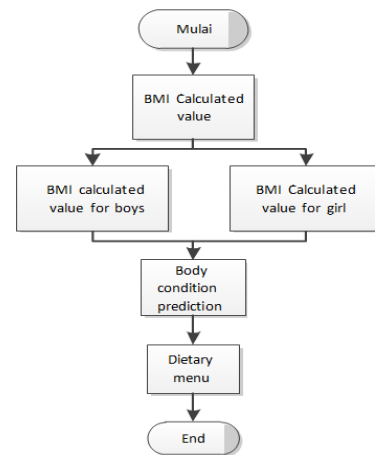
Successful management is greatly dependent on parent's attitude. Parents must recognize the need for the child to become thinner, must be sufficiently motivated to make and sustain changes to child's diet and if necessary that of the family, and be able to provide the adequate emotional support for the child. The management objective for child's diet is prevent further weight gain until height has caught up in proportion to weight, establish more appropriate eating habits and increase physical activity. Treatment approaches must be age-dependent. The focus must be on parental food purchasing and

preparation as well as activities. Giving dietary modification should looking dietary reference value (DRV).

**2. SYSTEM MODELING**

Body condition determination is determined assesses BMI Percentile. To determine BMI Percentile earlier has to determine BMI'S point with depending on body's height and weight. Result of this BMI's point then be inserted to table CDC that adjusted by age and gender. Table this was differentiated bases gender for age child 2-20 years. After know BMI Percentile's point therefore can be gotten weight Status Category.

Besides determination BMI Percentile, also been given dietary menu for child that corresponds to their body nutrition intake. The flow charts of this program can be represented below.



**Fig 2.** Flow Chart Information System

**A. Software BMI Calculation**

To know the condition of children are obese or not, first made calculations using software BMI percentile. This application is different for adult's BMI application because the children have depending on gender and age. The first calculation are same as the general BMI with include body's height and weight to get BMI number. After get BMI number, BMI percentile value can be get from CDC charts for girls or boys with included

BMI number, age and sex. After that, the weight status category for the calculated BMI-for-age percentile as shown in this application.

This application can calculation BMI percentile without user check on CDC charts. User only insert age, sex, body's weight and body's height. The final result of this application is user get the weight status category. This category divided on 4 criteria: underweight, healthy weight, over weight and obese. This application build in ajax technology [7];

Fig 3. Software BMI Percentile

Besides getting the weight category and BMI percentile, this website also provide dietary food menus with nutrition intake percentage on this menu.

Fig 4. Dietary Menu

### 3. CONCLUSIONS

Information systems is useful for parents to be partners in monitoring the development of child health. That knowing the condition of the child's body can make the parents know what to do for child's developments. The BMI percentile number can get the child's weight status category. This application eases user to get BMI percentile without looking CDC charts. Besides giving menu according to DRV references will make the child fulfilled the needs of his body.

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