Nutrition in Children: A Short Literature Study

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Abstract

A short literature study of children's nutrition provides the basic data on types of nutrition; age standards for the number of basic food ingredients. In a study of schoolchildren nutrition, it was shown that the absence of healthy eating behavior inevitably leads to a pathological violation of vital functions, particularly digestion. In the future, this is the basis for the development of chronic pathology, as well as deviations of the physical development of children.

Keywords: Nutrition; Children; Adolescents; Age Norms

Good nutrition is one of the essential components of a healthy lifestyle. Baby food should be associated with the processes of intense metabolism, which is one of the main factors determining the adequate development of the child. A group of nutritionists proposed a number of terms [1-3] (Table 1).

<table>
<thead>
<tr>
<th>Type</th>
<th>Feature</th>
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<tbody>
<tr>
<td>Nutrition</td>
<td>Nutrition, satisfying the physiological needs of a person in energy and nutrients and ensuring the maintenance of health, well-being, high working capacity, learning ability, resistance to infections, toxins and other adverse environmental factors</td>
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<tr>
<td>Balanced nutrition</td>
<td>Nutrition providing optimal and balanced amounts of nutrients</td>
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<td>Optimal nutrition</td>
<td>Nutrition that provides the child with not only energy and a balanced amount of replaceable and irreplaceable nutrients, but also with a number of minor biologically active food components, including flavonoids, isoflavones, phytosterols, phytoestrogens, nucleotides, etc.</td>
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<tr>
<td>Dietary (medical) nutrition</td>
<td>Pathogenetically based nutrition in children with acute and chronic diseases at all stages, from exacerbation to remission, inclusive</td>
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<tr>
<td>Preventive nutrition</td>
<td>Nutrition aimed at the prevention (primary and secondary) of various diseases of childhood, as well as the prevention of adverse effects of various environmental factors</td>
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Table 1: Types of nutrition.

The nutrition of infants is of the great importance. In this case, the following concepts are distinguished:

- Natural or exclusive breastfeeding - feeding the baby with mother’s milk.

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• Mixed feeding (according to the recommendations of the World Health Organization - WHO partially breastfeeding) - a combination of breastfeeding the baby with its artificial substitutes (at least 150 - 200 ml per day).

• Artificial feeding - feeding the baby with breast-milk substitutes [2,5,6].

Unfortunately, those age norms for the number of basic food ingredients, macro- and micronutrients determined by the Research Institute of Nutrition Russia [3,7] and the WHO [6,8] are currently subjected to the violations. Despite the obesity pandemic in developed countries, in developing countries the body mass index of less than 18.5 is observed in 20% of adults, and growth retardation is observed in 50% of children [9-11]. Fifty percent of child mortality is due to malnutrition [9]. In Russia deficiency in the main food ingredient in childhood - protein and iron deficiency are about 30%, calcium and zinc - 25% [1-3]. All types of deficiencies in food ingredients require timely replenishment of the food products, and also require the drug correction to prevent the disease.

School age is a key period in the development of the human body, in which the formation of the skeleton and skeletal muscles is completed, neuro-hormonal restructuring occurs, which underlies puberty [1,2]. Eating disorders can lead to serious deviations in the vital functions of the body, including disturbances in the functioning of the digestive organs, cardiovascular and nervous systems. Providing schoolchildren with full, rational nutrition is one of the main conditions for their harmonious development and nutritional behavior [12].

The study was conducted on the basis of two standard schools of the Russian Federation. To study the level of knowledge on the nutrition, an anonymous questioning of adolescents 15 - 17 years old (n = 180) was carried out. Next, the apportionment menu was assessed for the main ingredients and energy value per week and a comparative analysis of the results was obtained with the recommended needs of school lunches [14].

In School A, which practices proper nutrition, most children receive a comprehensive lunch. Weekly indicators for the caloric content and protein, fat and carbohydrate content of organized dinners correspond to the needs of children 15 - 17 years old [13].

In school B with free distribution of food, 70% of the children surveyed solve the issue with lunch on their own. They often eat sweets and pastries for a lunch (p = 0.01), which leads to a violation of the eating behavior [12]. And in the end, every second respondent, 2 times more likely to be boys (p = 0.01), at least once a month experiences heaviness in the abdomen after eating, pain in the epigastric region for an hour after eating and heartburn.

The correlation analysis revealed a strong direct correlation between the type of lunch at school and their saturation with children (r = + 0.9, p = 0.01). The study showed the balance of organized school nutrition, in which the needs of a growing organism are satisfied in macro- and micronutrients [13].

Currently, the concept of “metabolic programming of child health nutrition” [1,2], nutrigenetics and nutrigenomics [15] are being developed. In the formation of the various pathologies, data are studied on the assessment of the interaction of food substances (nutrients) and genome structures, the significance of the food deficiencies. Nutrigenetics are used to prevent obesity, cardiovascular disease, asthma, malignant neoplasms and many other diseases. Traditional (classical) approaches to the diet therapy are preserved, but there are new directions, for example, neurodietology: the use of polyunsaturated (omega-3) fatty acids, gluten-free diets, vitamin D, etc [15]. In the pandemic of a coronavirus infection, patients who are on intensive care cannot receive nutrition by the natural oral route. They need the artificial medical nutrition [16,17]. In children, some aspects of the diet therapy and the procedure for choosing the type of nutritional support are being reviewed.

**Conclusion**

As you know, malnutrition in children contributes to the development of malnutrition, but there is the concept of quality starvation. Students who eat on their own with the preference for digestible carbohydrates often have eating disorders. In the future, they have a
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diverse chronic pathology. Therefore, the organization of school lunches should be mandatory. For the prevention of chronic diseases, deficiency of food ingredients, timely replenishment of macro- and micronutrients is required.

Currently, direct (classical) approaches to diet therapy are maintained. In a pandemic of coronavirus infection, children receiving intensive care require the development of enteral dietary approaches. New directions are being developed, such as nutrigenetics, nutrigenomics, neurodietetics, etc.

Bibliography


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