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COMMON NUTRITIONAL DEFICIENCIES IN CHILDREN OF SCHOOL AGE

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Abstract
The topic article explores the essential nutrients often lacking in the diets of children between the ages of 6 and 12. This age group is especially vulnerable due to rapid growth, increased physical activity, and the transition to school environments that may not always provide balanced meals. The annotation focuses on key deficiencies such as iron, which can lead to anemia and affect cognitive performance; vitamin D, critical for bone development; calcium, essential for skeletal growth; and iodine, necessary for proper thyroid function and mental development. It also considers the causes of these deficiencies, including poor dietary habits, lack of nutritional education, food insecurity, and cultural or socioeconomic factors. The topic emphasizes the importance of early intervention through dietary improvements, school-based nutrition programs, supplementation when necessary, and awareness among parents, caregivers, and educators. Addressing these deficiencies is crucial to support children's physical health, academic performance, and overall well-being.

Keywords: Schoolchildren, violations in nutrition organization, nutritional status.

Introduction

The nutrition of schoolchildren throughout the whole period of schooling remains unbalanced. The imbalance explained by irrational selection of foodstuffs used both at home and in the educational environment. The deficiency of vitamin intake with food has a combined, year-round character, found not only in winter-

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spring, but also in summer-autumn periods of the year. During this developmental stage, children experience significant physical, cognitive, and emotional growth, which increases their nutritional requirements. However, many children do not receive adequate nutrition, leading to deficiencies that can have lasting effects on their health and development.

Key Nutritional Deficiencies:

1. **Iron Deficiency:** Iron is essential for the production of hemoglobin, which carries oxygen in the blood. Deficiency can result in iron-deficiency anemia, characterized by fatigue, weakness, and decreased attention span. It is one of the most common deficiencies in school-age children, particularly among girls and children from low-income families.

2. **Vitamin D Deficiency:** Vital for calcium absorption and bone development, vitamin D deficiency can lead to rickets (bone softening) and poor immune function. Contributing factors include limited sun exposure, darker skin tones, and inadequate dietary intake of fortified foods.

3. **Calcium Deficiency:** Calcium is crucial for building strong bones and teeth. A deficiency can result in poor bone mineralization and increased risk of fractures. Many children do not consume enough dairy or calcium-fortified foods, especially those with lactose intolerance or milk allergies.

4. **Iodine Deficiency:** Iodine is necessary for proper thyroid function and brain development. Even mild deficiencies can impair cognitive development and academic performance. Iodized salt and certain seafood are common sources, but intake can be insufficient in some regions.

5. **Zinc Deficiency:** Zinc plays a role in immune function, growth, and wound healing. Deficiency can cause growth retardation, increased susceptibility to infections, and delayed sexual development.

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6. **Vitamin A Deficiency:** Less common in developed countries but still present, vitamin A deficiency can affect vision, immune response, and overall growth. It is more prevalent in populations with limited access to a variety of fruits and vegetables.

Causes of Nutritional Deficiencies:

- **Poor dietary habits (**e.g., high intake of processed foods and sugary snacks)
- **Lack of nutrition education** among parents and children
- **Socioeconomic factors** limiting access to healthy food
- **Selective eating behaviors** or food aversions in children
- **Inadequate school meal programs** or reliance on low-nutrient convenience foods

Consequences of Deficiencies:

- Impaired physical growth
- Reduced cognitive development and academic performance
- Increased susceptibility to illness
- Long-term health complications (e.g., osteoporosis, developmental delays)

Intervention Strategies:

- Implementation of **school nutrition programs** offering balanced meals
- **Public health campaigns** to raise awareness about child nutrition
- **Fortification of foods** with essential nutrients (e.g., flour, milk, salt)
- **Parental education** on meal planning and healthy food choices
- **Regular health screenings** to detect and treat deficiencies early

Organization of rational nutrition of pupils during their stay at school is one of the key factors of maintaining their health and learning efficiency, since children spend 6 to 8 hours daily in an educational institution. Inadequate nutrition for schoolchildren is unacceptable, as it can affect the ability to learn, affect health and learning. A change in dynamic stereotype leads to tension of adaptation mechanisms and reduction of functional capabilities of schoolchildren's

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organism, which aggravated by the impact of unfavorable factors, including those caused by lifestyle, irrational consumption of basic foodstuffs, and violation of dietary regimen. Insufficient provision of schoolchildren with the necessary nutrients has resulted into the increase in the prevalence of functional deviations in the state of health of students by 85%, chronic diseases – by 84%.

The issues of organization of nutrition of school-age children given attention in the period of formation of school hygiene in the late XIX and early XX centuries. The issues of nutrition remain relevant today. According to the results of numerous studies, it established that many children already by the beginning of by the beginning of their schooling; many children have formed irrational stereotypes of food choices. In addition, the widespread popularity and availability of fast-food enterprises, which often have special “children's menus”, lead to an increase in the number of children's food choices. Child malnutrition and under nutrition have become one of the largest global social problems in the world today. Growing inequality, conflict, climate change, rising food prices and increased consumption of unhealthy foods are exposing millions of children to food insecurity. According to the June 6, 2024 United Nations Children's Fund (UNICEF) Child Food Poverty Report, 440 million children under 5 years of age worldwide are undernourished, of whom 181 million live in severe child food poverty. This means that every fourth child (27%) suffers from acute malnutrition in early childhood.

Among 92 countries participating in this study, Uzbekistan ranked 26th in terms of the number of children living in acute food poverty with 11% (511,000 children aged 0-5 years). For Central Asia, Turkmenistan registered 4% (5th place), Kyrgyzstan 12% (27th place) and Tajikistan 34% (78th place).European countries are almost absent from the list. The exceptions are the countries of the Balkan region, with Serbia at 2%, Montenegro at 7%, Northern Macedonia at 11% and Albania at 18%. In China, the world's second largest economy with a population of almost 1.5 billion, 10% of children live in severe food poverty. Child food poverty defined as the inability of children to access and consume nutritious and diverse food during early childhood (i.e. the first five years of life).

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Children living in extreme child food poverty are those who eat only 0-2 types of food per day. Children living in moderate child food poverty are those who eat only 3-4 types of food per day. Children not living in child food poverty are those who eat 5 or more types of food per day. According to the study, 84 million (46%) of the 181 million children in severe food poverty live in the poorest households, the remaining 97 million (54%) - live in middle-income households. It is noteworthy that low household income is not always the main factor in food poverty. In its study, UNICEF identified three causes of acute food poverty: deterioration of the food environment, inappropriate feeding practices and lack of family income. According to experts, child malnutrition affects all children, especially in early childhood the consequences can be sad. Because lack of food during this period leads to lack of nutrients that are very important for the growth and development of the child. The effects of malnutrition in early childhood can have lifelong consequences: these children perform worse in school and have fewer opportunities to earn money as adults, increasing the risk of their households falling into poverty

In addition, the strategy should implement special programs aimed at providing qualified medical and nutritional advice, conducting preventive examinations and raising public awareness of healthy nutrition. Secondly, in order to adjust children's nutrition based on their health, it is necessary to create a “Smart Nutrition” section in the BEBBO application developed by UNICEF and the Ministry of Health using artificial intelligence capabilities. This section should make it possible to analyze data on the child's development depending on his/her age (weight, height, level of fats and vitamins in the blood) and provide parents with individual recommendations on the correct nutrition of the child. To implement this project, it is advisable to cooperate with international organizations, such as UNICEF and the World Food Program, and use their experience. Thirdly, it is necessary to study foreign experience in organizing targeted (for children from low-income families) free school meals for students. For example, French President Macron included the provision of €1 school lunches in his plan to eliminate poverty, including malnutrition, and directed these benefits to feeding children in need. In the U.S., the National Strategy on Hunger,

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Nutrition and Health updated in 2022 to include an expansion of free school meals. As a result, children from families at or near the poverty line became automatically eligible to use meal benefits.

Conclusion

As a review of the literature shows, problems in the organization of school-age children's nutrition found both in Uzbekistan and abroad. As the literature review shows, there are problems in the organization of school-age children's nutrition both in Uzbekistan and abroad: lack of essential nutrients (complete protein, vitamins and minerals)products - sources of essential nutrients (complete protein, vitamins and minerals), high consumption by children of products - sources of simple carbohydrates, saturated fats (sugar, cereals, vitamins and minerals confectionery, pasta, bakery,sausages). The organization of schoolchildren's nutrition is programmable, since it does not depend on the child's wishes and taste habits; it depends directly on the educational institution and parents. Consequently, the problem of rationalization of schoolchildren's nutrition, bringing diets in line with physiological needs in food and biologically active substances requires today managerial decisions in terms of organization, systematization and standardization of nutrition in the conditions of educational institutions; development of a unified system of nutrition and nutritional support for schoolchildren.in educational institutions;

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