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ROLE OF VITAMINS IN HUMAN NUTRITION

Introduction

Vitamins are organic nutrients essential for life. Each of them has specific functions in the body that make them unique and irreplaceable. Therefore, the lack of vitamins leads to metabolic dysfunctions and related diseases.



Purpose

- to explore vitamins` importance in human diet
- to highlight data related to impact of vitamin deficiency on the population worldwide.

Material and methods

The study explores the data from World Health Organization and Our World in Data Organization referring to micronutrient deficiencies among the population in Moldova and worldwide. The information according to reasons, manifestation, impact and prevention of vitamin deficiencies was examined by using such methods as analysis, synthesis and generalization. The accent within the content was focused on prevalence of anemia because of malnourishment in pregnant women and children under the age of five.

There are thirteen vitamins required for proper functioning of human metabolism.

VITAMIN	BENEFITS	GOOD FOOD SOURCES
RETINOIDS AND CAROTENE (vitamin A)	Essential for vision, keeps tissues and skin healthy. Plays an important role in bone growth and in the immune system. Carotenoids act as antioxidants.	Retinoids: beef liver, eggs, fish, butter. Beta carotene: potatoes, carrots, pumpkins.
THIAMIN (vitamin B₁)	Needed for healthy skin, hair, muscles, brain and is critical for nerve function.	Pork chops, brown rice, ham, soymilk, watermelons.
RIBOFLAVIN (vitamin B₂)	Helps convert food into energy. Needed for healthy skin, hair, blood, and brain.	Milk, eggs, meats, green leafy vegetables, whole grains and cereals.
NIACIN (vitamin B₃)	Helps convert food into energy. Essential for healthy skin, blood cells, brain, and nervous system.	Meat, fish, whole grains, mushrooms, potatoes, peanut butter.
PANTOTHENIC ACID (vitamin B₅)	Helps make lipids, neurotransmitters, steroid hormones, and hemoglobin.	Chicken, egg yolk, whole grains, broccoli, mushrooms, avocados.
PYRIDOXINE (vitamin B₆)	Helps convert tryptophan to niacin and serotonin. Helps make red blood cells.	Meat, fish, poultry, legumes, tofu potatoes, noncitric fruits.
COBALAMIN (vitamin B₁₂)	Assists in making new cells and breaking down some fatty acids and amino acids. Helps make red blood cells and DNA.	Meat, fish, milk, cheese, eggs, fortified cereals, fortified soymilk.
BIOTIN	Helps synthesize glucose. Helps make and break down some fatty acids.	Whole grains, organ meats, egg yolks, soybeans, and fish.
ASCORBIC ACID (vitamin C)	Assists in collagen formation. Helps make the neurotransmitters serotonin and norepinephrine. Acts as an antioxidant. Bolsters the immune system.	Citrus fruits, potatoes, broccoli, spinach, strawberries, tomatoes.
CALCIFEROL (vitamin D)	Helps maintain normal blood levels of calcium and phosphorus.	Fortified milk or margarine, fortified cereals, fatty fish.
ALPHA-TOCOPHEROL (vitamin E)	Acts as an antioxidant. Protects vitamin A and certain lipids from damage.	Vegetable oils, wheat germ, leafy green vegetables, whole grains, nuts.
FOLIC ACID (vitamin B₉)	Vital for new cell creation. Helps prevent brain and spine birth defects when taken early in pregnancy.	Fortified grains and cereals, asparagus, spinach, broccoli.
PHYLLOQUINONE, MENADIIONE (vitamin K)	Activates proteins and calcium essential to blood clotting.	Cabbage, liver, eggs, milk, spinach, broccoli, sprouts.

Pic.1 . Listing of vitamins (abbreviated). Original source: https://www.health.harvard.edu/staying-healthy/listing_of_vitamins

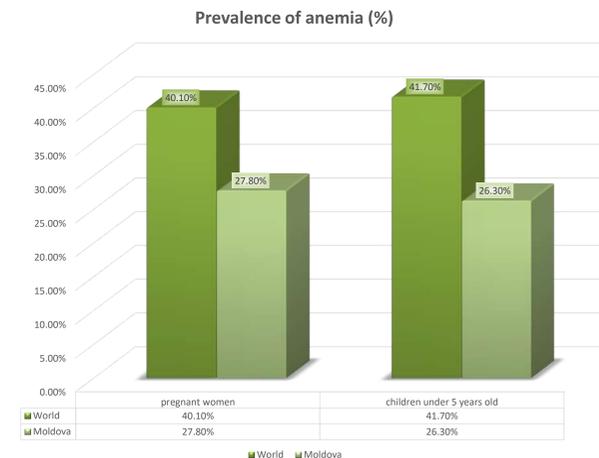


Pic.2. General factors involved in vitamin deficiencies.

The condition of a prolonged lack of a vitamin is called **vitamin deficiency (VD)**. The World Health Organization (WHO) estimates that more than *two billion people* suffer from micronutrient deficiency globally.

Results

There are certain life periods, during which demand for specific vitamins and minerals increases. *Pregnant women* and *children* are at greatest risk of developing vitamins` deficiencies. This is a result of both factors: low dietary intake and high physiological demands.

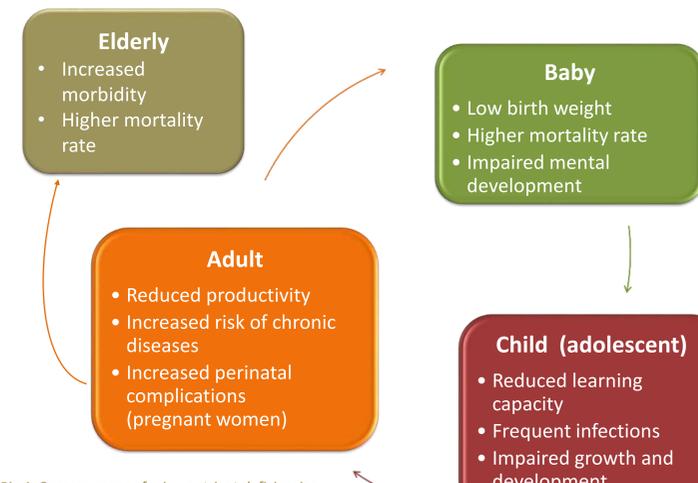


Pic.3. Prevalence of anemia in children and pregnant women globally and in Moldova. 2016. Original source <https://ourworldindata.org/micronutrient-deficiency>.

Our World in Data Organization reports that anemia affects more people than any other health problem. Micronutrient deficiency anemia can result from a *lack of iron or vitamin B₁₂, folate*.

In 2016, around 40% of pregnant women and around 42% of children were anemic globally. In the Republic of Moldova these values were twice reduced.

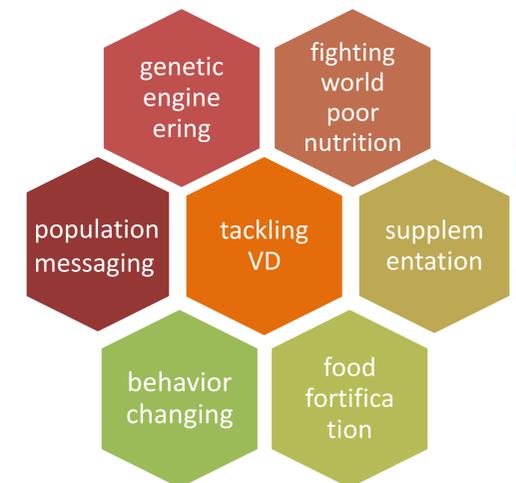
Although pregnant women and children are often cited to be affected the most by micronutrient deficiencies, these deficits may impair the people`s health throughout the lifetime.



Pic.4. Consequences of micronutrient deficiencies throughout the life cycle. (abbreviated). Original source https://www.ijpri.org/sites/default/files/ghi/2014/figure_1818.html.

Conclusions

The effects of micronutrient deficiencies can be devastating. Even mild to moderate deficiencies can affect a person`s well-being and development. *Multispectral approaches* and *a range of interventions* are required to tackle sustainably the underlying causes. *Behavior-change communication* and *hygiene* are essential components that aim to improve women`s, infants`, and young children`s utilization of health services, and protect them from diseases that interfere with nutrient absorption. The fact of *providing* the population with *appropriate information referring to natural vitamins sources* also can contribute to formation of deliberate choices in favor of nutritious food.



Pic.5. Components essential to tackling vitamin deficiencies.

Keywords

Vitamin, health, nutrient, diet, deficiency

References

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