



Nutrition and Its Impact on Health: A Comprehensive Overview

**DR. MONIKA PANCHANI*, ASSOCIATE PROFESSOR,
DEPARTMENT OF ZOOLOGY. VGC MANDI.**

monikapanchani11@gmail.com

Abstract

Nutrition plays a pivotal role in maintaining overall well-being and helps in prevention of various chronic diseases. For prevention and management of conditions such as obesity, diabetes, cardiovascular diseases, and certain cancers importance of nutrition acts as a cornerstone of preventive medicine and public health. A balanced and nutritious diet is crucial for optimal growth, development, and the maintenance of physiological functions throughout life. Adequate intake of macronutrients (carbohydrates, proteins, and fats) provides the energy necessary for daily activities and metabolic processes. Essential vitamins and minerals play a vital role in various physiological functions. The gut microbiome, composed of trillions of microorganisms, is influenced by diet and, in turn, affects digestion, nutrient absorption, and overall health. Probiotics and prebiotics, found in certain foods, contribute to a healthy gut microbiome, impacting immune function and inflammation. A well-balanced and varied diet is fundamental to promoting and maintaining overall health and well-being throughout the life span. Good nutrition is a key component of a healthy lifestyle. It provides your body with the necessary nutrients to function properly, maintain energy levels, support growth and development, and prevent chronic diseases. A well-balanced diet rich in fruits, vegetables, whole grains, and lean proteins has been associated with a lower risk of chronic diseases, including cardiovascular diseases, certain cancers, and type 2 diabetes. Additionally, incorporating regular physical activity and adopting stress management techniques can complement a healthy diet in promoting overall mental well-being. In this review article impact of nutrition on health has been discussed.

Keywords: Nutrition, Chronic diseases, Vitamins, Minerals and Balanced diet

INTRODUCTION

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OBJECTIVE

- In this article nutrition and its components have been discussed.
- To provide Knowledge about diseases like diabetes, cardiovascular diseases like hypertension and heart disease, obesity, and certain types of cancer.
- To provide Knowledge about the balance diet and health management .

METHODOLOGY

This study is based on secondary data which includes published academic of literature. Therefore, an extensive literature review was conducted for the same. The literature search was done on an available public domain such as Google Scholar, pubmed, Jstor. The keywords used for the search included, nutrition, balanced diet, , cardiovascular diseases, diabetes, obesity and health management.

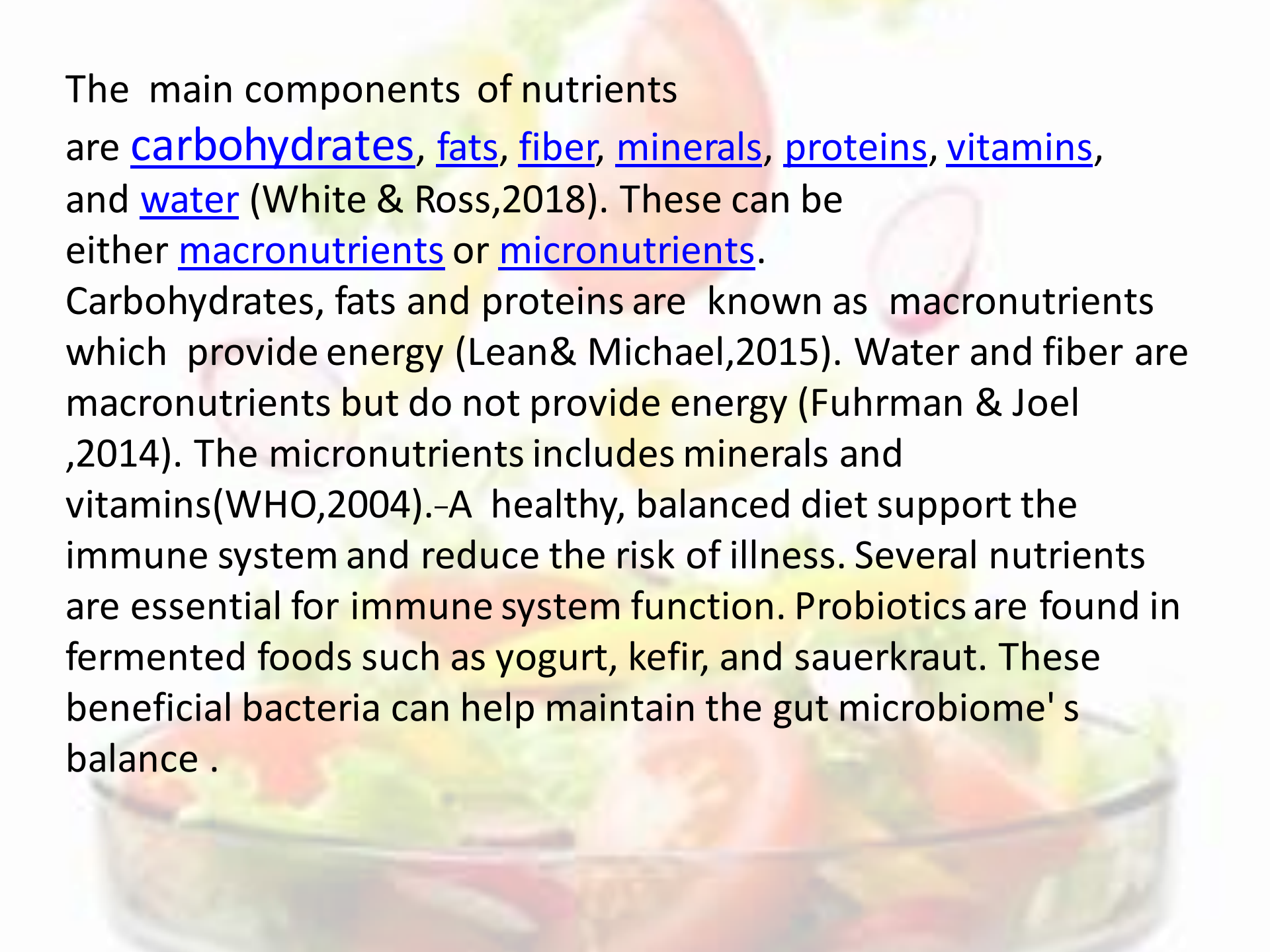
DISCUSSION

1. Nutrition and balance diet

2. About diseases like:

- **Diabetes**
- **Cardiovascular diseases**
- **Hypertension**
- **Obesity**
- **Certain types of cancer**

3. Management of diseases with diet



The main components of nutrients are [carbohydrates](#), [fats](#), [fiber](#), [minerals](#), [proteins](#), [vitamins](#), and [water](#) (White & Ross,2018). These can be either [macronutrients](#) or [micronutrients](#).

Carbohydrates, fats and proteins are known as macronutrients which provide energy (Lean& Michael,2015). Water and fiber are macronutrients but do not provide energy (Fuhrman & Joel ,2014). The micronutrients includes minerals and vitamins(WHO,2004).-A healthy, balanced diet support the immune system and reduce the risk of illness. Several nutrients are essential for immune system function. Probiotics are found in fermented foods such as yogurt, kefir, and sauerkraut. These beneficial bacteria can help maintain the gut microbiome' s balance .

Carbohydrates: The major food sources of carbohydrates are grains, milk, fruits, and starchy vegetables, like potatoes. These are source of energy for the body and help in the formation of cells.

Fat: Lipids are found in butter, oils, meats, dairy products, nuts, seeds, and processed foods. Provides stored energy for the body and provides insulation to vital organ. They maintain body temperature functions as structural components of cells. Fats act as signaling molecules for proper cellular communication.

Vitamins: There are thirteen vitamins classified as water-soluble or fat-soluble. The water-soluble vitamins are vitamin C and all the B vitamins, including thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, biotin, folate, and cobalamin. The fat-soluble vitamins are A, D, E, and K. These regulate body processes and help in normal functions of body-system.

Protein: These include meats, dairy products, soya products, seafood, and various plant-based foods. These are essential for tissue formation, cell preparation, muscle formation. Proteins help in hormone /enzyme production and improve healthy immune system.

Minerals: Minerals are inorganic substances may be micro and macrominereals. Trace minerals are required in a few milligrams such as molybdenum, selenium, zinc, iron, and iodine. Macrominerals are required in hundreds of milligrams such as calcium, magnesium, potassium, sodium, and phosphorus. These are necessary for proper cellular function and regulate body processes.

Water: About 70 percent of total body weight is water. Water transports essential nutrients to all body parts.

<u>Vitamin A</u> (retinol)	Vitamin A–fortified dairy products ,fish liver oils, liver, egg yolks, butter. As provitamin carotenoids: dark green and yellow vegetables, carrots, yellow and orange fruits.	Formation of rhodopsin in the retina, Integrity of epithelia, Lysosome stability and Glycoprotein synthesis
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Vitamin A Deficiency: Night blindness, xerophthalmia, keratomalacia, increased morbidity and mortality in young children and perifollicular hyperkeratosis

<u>Thiamin</u> (Vitamin B1)	Whole grains, meat enriched cereal products, nuts, legumes and potatoes etc.	Helps in metabolism of carbohydrate, fat, amino acid and glucose. It is required for central and peripheral nerve cell function and myocardial function.
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Thiamin (Vitamin B1)Deficiency: Beriberi (peripheral neuropathy, heart failure), Wernicke-Korsakoff syndrome

<u>Riboflavin</u> (Vitamin B2)	Milk, cheese, liver, meat, eggs and cereal products	Helps in carbohydrate and protein metabolism Integrity of mucous membranes
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Riboflavin (Vitamin B2)Deficiency: Cheilosis, angular stomatitis, corneal vascularization

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<u>Vit. B6</u> (pyridoxine, pyridoxal, pyridoxamine)	Organ meats whole-grain cereals, fish and legumes	Nucleic acid biosynthesis, Fatty acid, lipid, and amino acid metabolism Many aspects of nitrogen metabolism (eg, transaminations, porphyrin and heme synthesis, tryptophan conversion to niacin)
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Vitamin B6 Deficiency: Seizures, anemia, neuropathies, seborrheic dermatitis

<u>Vit.B12</u> (cobalamins)	Meats (especially beef, pork, and organ meats [eg, liver]), poultry, eggs, fortified cereals, milk and milk products	Maturation of red blood cells, neural function, DNA synthesis, myelin synthesis and repair
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Vitamin B12 Deficiency: Megaloblastic anemia, neurologic deficits (confusion, paresthesias, ataxia)

<u>Folate</u> (folic acid)	Raw green leafy vegetables, fruits, organ meats (eg, liver), enriched cereals and breads	Maturation of red blood cells Synthesis of purines, pyrimidines, and methionine Development of fetal nervous system
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Folic acid Deficiency: Megaloblastic anemia, neural tube birth defects, confusion

<u>Niacin</u> (nicotinic acid, nicotinamide)	Liver, red meat, fish, poultry, legumes, whole-grain or enriched cereals and breads	Oxidation-reduction reactions Carbohydrate and cell metabolism
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Niacin Deficiency: Pellagra (dermatitis, glossitis, gastrointestinal and central nervous system dysfunction)

<u>Vit. C</u> (ascorbic acid)	Citrusfruits, tomatoes, broccoli, strawberries, sweet peppers	Collagen formation, Wound healing, Bone and blood vessel health Carnitine, hormone, and amino acid formation
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Vitamin C Deficiency: Scurvy (hemorrhages, loose teeth, gingivitis, bone defects)

<u>Vit. D</u> (cholecalciferol, ergocalciferol)	Direct ultraviolet B irradiation of the skin (main source), fortified dairy products (main dietary source), fish liver oils, fatty fish, liver	Helps in absorption of calcium and phosphate, Mineralization and repair of bone, Tubular reabsorption of calcium, Insulin and thyroid function, improvement of immune function, reduced risk of autoimmune diseases
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Vitamin D Deficiency: Rickets (sometimes with tetany), osteomalacia

<u>Vit. E</u> (alpha-tocopherol, other tocopherols)	Vegetable oils, nuts	Intracellular antioxidant Scavenger of free radicals in biologic membranes
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Vitamin E Deficiency: Red blood cell hemolysis, neurologic deficits

<u>Vit. K</u> (phylloquinone, menaquinones)	Green leafy vegetables (especially collards, spinach, and salad greens), soy beans, vegetable oils. Bacteria in the gastrointestinal tract after neonatal period	Formation of prothrombin, other coagulation factors, and bone proteins
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Vitamin K Deficiency: Bleeding due to deficiency of prothrombin and other factors, osteopenia

Nutrition and Diseases

Inadequate daily intake of diet is termed as undernutrition while malnutrition is the term for imbalance or inadequately in the quality of the diet (Boyd, 1950).

Inadequate calorie intake results in sufficient physical development and less activity on the part of children.

About 20% of young people and 42% of adults have obesity, type 2 diabetes, and some cancers and are at risk of heart disease in the United States .

In one of findings Iron deficiency affected 15% of the world population and anemia was observed in about 40% to 50% of children (Pollit, 1993). Overweight, obesity and diet-related diseases can cause heart disease, stroke, diabetes and some cancers.-Low-fat diet reduces the risk for the most prevalent form of cancer (Black et al., 1995).

The deposits of fats and lipid making them stiff and causes narrowing of arteries [atherosclerosis](#) results in [myocardial infarction](#) ([heart attack](#)). Main leading causes of heart disease and stroke are high blood pressure and high blood cholesterol.

A high intake of food rich in free sugars results in a fast release of glucose into the blood and large amount of insulin causes glucose intolerance and insulin sensitivity, type-2-diabetes, and cardiovascular risk factors. Obesity is associated with several types of cancer, including colorectal, prostate, [uterine](#), [pancreatic](#), and breast cancers. Unhealthy food and beverages, such as sugar-sweetened beverages and highly processed food, can lead to obesity and other chronic conditions like cancer.

MANAGEMENT

Nutrition plays important role for proper functioning of the body, therefore by managing the diet one can prevent from diet associated diseases. Taking the balanced diet by including various components such as vitamins, carbohydrates, lipid, minerals etc. diseases can be controlled to some extent.

Avoid unhealthy food and beverages, such as sugar-sweetened beverages and highly processed food, can lead to weight gain and obesity .

To prevent Cardiovascular diseases, one must take balanced diet with plenty of fibre, Exercise regularly.

Maintain a healthy weight and body mass index .Cut down on alcohol and stop smoking.

CONCLUSION

A well-balanced and varied diet is fundamental to promoting and maintaining overall health and well-being throughout the life span. Good nutrition is a key component of a healthy lifestyle. It provides your body with the necessary nutrients to function properly, maintain energy levels, support growth and development, and prevent chronic diseases.

A well-balanced diet rich in fruits, vegetables, whole grains, and lean proteins has been associated with a lower risk of chronic diseases, including cardiovascular diseases, certain cancers, and type 2 diabetes.

Additionally, incorporating regular physical activity and adopting stress management techniques can complement a healthy diet in promoting overall mental well-being.

33% Fruit & Vegetables

5+ a Day

33% Starchy carbohydrates

Bulk of meals

15% Milk & Dairy

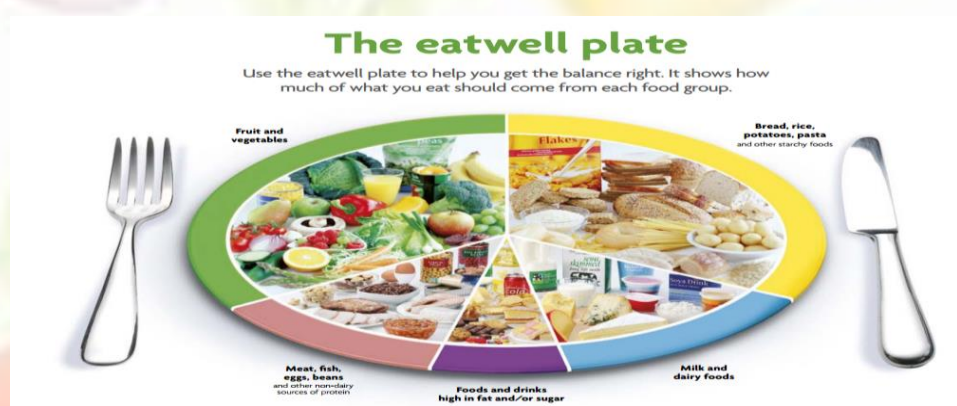
3 portions daily

12% Meat, Fish, Eggs, Beans

Oily fish once a week

<8% High fat/sugary foods

Avoid saturated fats



Thank you