

## A Brief Insight upon the Challenge of Nutritional Status Evaluation

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Received date: July 31, 2017; Accepted date: August 04, 2017; Published date: August 10, 2017

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### Abstract

In nowadays the estimation of the nutritional status is of high importance, in direct link with health status, therapy recommendations and prediction of diseases risk profile. But there is a long list of variables to take into account when this evaluation has to be made. All of the information, lab tests, psychological profiles and patient's medical history will be used to develop a proper and personalised nutritional care plan, rigorously followed in time, in order to avoid acute and chronic diseases.

**Keywords:** Nutritional status; Food safety; Bioinformatics

### Introduction

The nutritional status of a person shows the degree to which physiological needs are covered by food intake. The food requirements are influenced by: stress (infections, acute and chronic pathology, trauma's, mental stress) and various physiological anabolic states (growth, pregnancy, convalescence). It is important to complete the sentence with laboratory test, a psychological profile, a proper anamnesis, and a food frequency questionnaire, in order to have the best nutritional risk assessment for the patient and to know what will be the next step to follow [1-3].

Food intake is influenced by the:

- Economic status
- Culture
- Emotional climate
- Pathological conditions
- Eating behavior
- Food safety and hygiene
- Ability to consume and absorb food.

When there are no major differences between the needs and the consume, optimum nutritional status is achieved and it that allows growth and development, maintaining health, day-to-day activities, and protection against various diseases. Appropriate methods can detect nutritional deficits in the early stages, allowing the restoration of an adequate nutritional intake in order to improve nutritional status and prevent worsening of the deficiency [4,5].

The nutritional status represents the total of the morpho-functional characteristics of an individual or of a community, conditioned by individual aspects, food sources, and environmental factors.

### Individual factors

The intrinsic factors of a person can influence the nutrients metabolic needs, thus affecting the nutritional state.

**Age:** Increase needs in calcium in the elderly due to decreased absorption efficiency, or increased need for protein and energy in young people, when growth and development are more intense.

**Gender:** Gender differences, generally seen after puberty, can influence both nutritional growth and metabolism (e.g. higher iron needs in adolescents and fertile women).

**Genetic factors:** Individual genetic anomalies influence nutritional status by altering nutrient absorption, but also by dietary restrictions imposed by lactase deficiency.

**Psychological factors:** Play a determining role in the evolution of nutritional status. Thus depression and social isolation favor the reduction of nutrition; nervous anorexia and bulimia are the most acute but also the most controversial intake disorder; stress, acute conditions and anxiety play an important role in unbalancing individual nutrition.

**Physical activity:** The nutritional consequences of an intense activity may occur in the form of iron deficient anemia or deficiency of mineral salts occurring in athletes, marathoners or swimmers. Vitamin intake (thiamine, riboflavin and niacin) should be proportional to caloric intake. At the opposite end, sedentarism correlated with hypercaloric diet, favors overweight and overweight over time.

Allergy and food intolerance are involved in selecting foods from the daily ratio.

**Pathological condition:** Disease is a stressful factor on nutritional storage and a barrier against normal nutrition, various pathological conditions interfere with the ingestion, metabolism, absorption, transport or excretion of nutritional factors.

**Drugs:** Interaction between different medications taken and diet can greatly affect the bioavailability of nutrients and, implicitly, the nutritional status. For example, drugs may reduce the intestinal absorption of nutrients (tetracyclines decrease iron absorption, phosphorus antacids reduce phosphorus absorption, vitamin C megadoses can decrease vitamin B12 absorption); or it can increase urinary elimination of nutrients (e.g. aspirin and barbiturates increase ascorbic acid excretion, thiazide diuretics produce potassium depletion) [2,3,6].

## Food factors

The chemical form of the nutrient can influence:

Its biological use: e.g. iron, the organic / hemic form in food is considered more absorbable than non-chemical form;

The protective effect of the cofactor, thus altering the adverse effect of the environment: Vitamin C in low form of ascorbic acid, but not in oxidized form of dehydroascorbic acid, neutralizes carcinogenic nitrozamines in the stomach. The percentage of participation of the reduced form and of the oxidative form of vitamin C varies considerably.

**Total ingested energy:** is also a determinant of the use of nutrients, especially proteins. The daily amount of protein required to maintain the nitrogen balance is higher in the hypocaloric diet. Both the positive and the negative energy balance influence the nutritional status of an individual, possibly favoring obesity, or at the opposite of protein-energy malnutrition. Ethanol ingestion=alcoholic beverages is also an exclusive source of metabolic energy. Excessive consumption can have many antinutritional consequences, the most serious effects being toxic with the production of alcoholic hepatitis and liver cirrhosis. The chronic level of alcoholism reduces or produces food balance disorders, decreases the absorption of ingested nutrients, reduces their use and disturbs metabolism.

**Food processing and preparation:** can increase or decrease food needs for a number of nutrients. For example, raw meat consumption decreases copper absorption, calcium oxide enriched flour increases the niacin requirement; The use of food additives for flavoring enrichment, preservation or color change; Processing and storage processes can destroy or alter nutrients in foods (vitamin C and a series of vitamins B are lost by thermal processing, fat becomes redundant and liposoluble vitamins are lost if they are not protected by natural or artificial antioxidants); The thermal processing of food can produce organic reactions when roasting dried fish or meat carcinogenic heterocyclic amines.

**Food fibers:** besides the beneficial effect of hipocolesterolemia, favoring the development of the fermentation flora and accelerating the intestinal transit, also shows the effects of the organism's degradation in a series of necessary microelements, favoring the installation of rickets, osteoporosis or ferrites anemia in different groups population.

**The effect of other food components:** A number of effects may occur due to other food components: Leaf vegetables (spinach, lettuce) or cocoa and chocolate can form oxalate gravels, favoring the installation of hexoses or Ca, Fe, Zn, Mg Insoluble, non-assimilable salts; Natural enzymes in food can destroy thiamine or activate pancreatic amylases and proteases; Avidin egg albumin binds to endogenous biotin and inactivates it; Tea and coffee tannin, reduces the use of iron; Increased doses of vitamins and mineral salts also have undesirable, toxic effects: excess vitamin A can cause liver fibrosis and increased intracranial pressure; Excess vitamin B can lead to hypercalcemia, nicotinic acid is vasodilator, excess vitamin C is laxative, and increased doses of Zn block iron uptake in food.

**Food safety:** The microbiological, chemical, physical and also sensorial characteristic of food stuff, the hygiene conditions of cooking and storage, will influence the food products availability, frequency of consuming, food policies applied, educational impact on population, also the trends in consumption and consumers health [7-9].

## Environmental factors

**Climate conditions:** Ambient temperature has a direct role in nutritional requirements, as: excessive cold uncompensated by adequate clothing will produce increased energy needs, vitamin C and possibly a series of B-complex vitamins; Excessive heat in the tropics or the workplace increases the demand for water and electrolytes. Mineral elements such as Zn and Fe can also be affected by massive sweat loss.

**The physical environment:** The construction of housing adapted to offset the adversity of the climate is necessary, along with proper sanitation and appropriate utilities.

**The biosynthetic environment:** Inadequate hygiene and poor sanitary measures can cause fecal contamination in homes, schools or workplaces. These cause an increased incidence of gastrointestinal infections.

Accessibility to internet, proper education and information (digital hygiene) [10,11].

## Conclusion

Nutritional status assessment should be routinely performed in all people, and assessment methods differ in healthy individuals from ill people, has to be adapted (even with digital application, new generation bioinformatics and internet accessibility). Those with a nutritional risk can be identified on the basic routine information during a medical visit.

All of the above information will be used to develop a nutritional care plan, personalized and rigorously followed in time, with a feedback from the patient and good communication skills.

## Conflict of Interest

The author confirm that there are no conflict of interest involved.

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