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The role of nutrition in persons with disabilities

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Nutrition as a part of health care significantly affects the patient´s healing process and is a necessary condition for successful treatment and improvement of the patient´s clinical condition. Natural, enteral and parenteral nutrition have healing effects and form a unified system of clinical nutrition. Inpatient care facilities for adults and pediatric wards, nutritional care is provided, adapted to the nutritional status and nutritional needs, morphological and functional state of the digestive tract and the age of the patient [1].

Malnutrition is a condition of poor nuttion, which includes any deviation from the state of good nutrition: it occurs as a result of insufficient intake of energy or protein according to the needs of the body, but also as a consequence of insufficient intake of vitamins and trace elements.

During the escalation of catabolism, anabolic processes are bound, the renewall of cells of the immune system, the epithelium of the digestive tract, is reduced, and bacteria are translocated through the intestinal wall. Reduced supply of nutrients increases the intesity of stress metabolism, reduces the effectiveness of treatment and worsens the course of the disease [2]. Malnutrition is associated with a higher risk of complications during the treatment of diseases, poorer woud healing, an increased incidence of infections, greater complications of surgery and other therapeutic interventions. It is associated with longer hospital stays and increased mortality [3,4].

Malnutrition is a serious global health problem that is far from being limited to developing countries. In developed European countiers, up to a third of patients suffer from various forms of malnutrition. In total, malnutriion affects more than 30 million people i Europe. Insufficient nutrition of the patient leads to a loss of muscle mass, which prevents effectice rehabilitation of patients, impairs physical fitness and quality of life [3]. At the same time, the effectiveness of many times expensive and costly treatment is impaired, which is closely related to the extension of hospitalisation and demands for hospital and outpatient health care. The cost of treating malnutrition-related health complications in EU countries is estimated at up to 170 billion Eur.

Malnutrition and disability are both major global public health problems, both are key human rights concerns, and both are currently prominent within the global health agenda. Malnutrition can cause or contribute to an individual's physical, sensory, intellectual or mental health disability. They affect large numbers of often vulnerable individuals, including children and adults: some one billion people worldwide are malnourished, and around one billion live with a disability [5].

Both are currently prominent within the global health agenda: the first ever World Report on Disability was published jointly in 2011 by WHO and the World Bank cost-effective interventions for tackling malnutrition have recently been high; lighted in the 2013 Lancet Nutrition Series and Scaling-up Nutrition (SUN), launched in 2010, is a major new movement tackling malnutrition by "uniting people – from governments, civil society, the United Nations, donors, businesses and researchers – in a collective effort to improve nutrition".

The fields of malnutrition and disability are closely interrelated with a number of points of convergence. Countries with high levels of malnutrition and nutrient deficiency also often report higher rates of disability and developmental delay. There are several important areas of overlap and influence: malnutrition can cause or contribute to a variety of different disabilities; disabilities can cause or contribute to malnutrition.

Maternal malnutrition. Maternal malnutrition can affect the development of the fetus, cause intra-uterine growth delay and increase the risk of the infant developing impairments. Micronutrients often play specific roles in such occurrences. For example, low maternal folate is associated with an increased risk of neural tube defects, one of the clearest examples of a micronutrient specific, often serious and yet largely preventable disability. A more general combination of maternal macro and micronutrient malnutrition is associated with physical and neurological/cognitive disabilities [5].

Child malnutrition. Infants and young children who are malnourished as defined by underweight (low weight-for-age) and stunting (low height-for-age) are also more likely to screen positive for disability. Macronutrient and micronutrient

deficiencie are risk factors for physical, sensory and cognitive impairment. For example, regarding micronutrient-associated disability, each year between 250,000 and 500,000 children become blind as a result of vitamin A deficiency. Several of the B vitamins are associated with disabling conditions: vitamin B1 (thiamine) deficiency manifests as beri-beri, symptoms of which include a lower extremity polyneuropathy; vitamin B3 (niacin) deficiency manifests as pellagra whose neurological effects include confusion and agitation; vitamin B6 (pyridoxine) deficiency is a rare but well recognised cause of intractable epilepsy. Childhood macronutrient malnutrition often manifests as underweight or wasting and also impairs immune system function and renders a child more susceptible to infection [5].

Dietitians are responsible for the nutritional management of individuals who are referred to their care. It is well recognised that people with disabilities are at risk of nutritional problems and therefore it is very important that there is access to dietetic services for this group. In children with Cerebral Palsy, feeding difficulties have been found to affect 60-90% of children. Many children with Autism Spectrum Disorder exhibit selective eating and therefore have self limiting diets which are unbalanced and problematic. Equally, children with conditions such as Down's Syndrome, Spina Bifida and Muscular Dystrophy experience a range of nutritional difficulties including undernutrition, eating, drinking and swallowing (EDS) disorders, constipation, vitamin & mineral deficiencies, bone problems, overweight/obesity, among others. A significant number of those presenting with EDS difficulties go on to require tube feeding [6].

Disabilities placing an individual at particularly high risk of nutritional deficiency include cerebral palsy, craniofacial anomalies (cleft lip and/or palate) and the many genetic syndromes such as Down syndrome and Pierre Robin sequence which are associated with, for example, oral-motor feeding and swallowing problems.

A high incidence/prevalence of malnutrition is often reported in children with disability, and this may result in poorer health and development, leading to a perpetuating cycle of sub-optimal nutrition, disability and worsening health status.

Malabsorption of nutrients is also common in children with certain conditions, including cystic fibrosis. Unless carefully managed with specially adapted diets (including pancreatic enzyme supplementation in the case of cystic fibrosis), both macro- and micronutrient-related malnutrition can occur. This may lead to increased muscle wasting and loss of function, and further exacerbate the insufficient intake of energy and nutrients, now through mechanical causes.

Children with disabilities are also disproportionately represented in many institutions and orphanages, and these facilities are often overlooked in food programmes. An additional concern is the often poor quality of food in institutions. While of concern to all institutionalised children, children with disabilities may be at particular risk.

Adult and later-life malnutrition. Malnutrition and under-nutrition in older adults can also increase the likelihood of breaking bones, including hip fractures, which can lead to limited physical mobility; problems with physical mobility after illness or injury can leave older adults physically unable to obtain or prepare food for themselves; leading to changes in eating patterns which can lead to further disability in older patients.

Assessing nutrition and energy requirements is challenging because the nutrition and energy requirements vary depending on the disability diagnosis, the severity of the disability, mobility status, age, medications, and feeding problems. When determining energy requirements, registered dietitian nutritionists may individualize the requirements based on all of these considerations, as well as monitor the individual and make changes to the plan of care as needed [7].

Conclusions. Disability is often seen as a specialist subject and therefore not mainstreamed into education for practitioners in nutrition, health and child development. Pre- and in-service training of professionals in health-care, nutrition and development on the links between disability and nutrition would increase awareness of the specific nutrition requirements of children with disabilities, and expand more inclusive programmes and practice. As nutrition efforts are scaled up, the needs of children and adults with disabilities must be integrated to ensure that they are offered the same life-saving interventions as other children [5].

Nutrition interventions for all children and adults will also benefit children and adults with disabilities. In order to ensure effective and inclusive nutrition, special attention should be paid by nutritionists, health-care and community service-providers to include children at high risk of becoming malnourished (such as those with existing disability or chronic disease) in existing nutrition programmes, as well as adapting or expanding community-based models of care and reaching out to institutions in which some children and adults with disabilities live.

Adults with developmental disabilities and children and youth with special health care needs have multiple risk factors requiring nutrition interventions, including growth alterations (eg, failure to thrive, obesity, or growth retardation), metabolic disorders, poor feeding skills, drug-nutrient interactions, and sometimes partial or total dependence on enteral or parenteral nutrition [7].

Comorbid conditions such as obesity or endocrine disorders that require nutrition interventions are also more likely to develop as the population ages. Poor nutrition-related health habits, limited access to services, and long-term polypharmacy are considered significant health risk factors and registered nutrition dietetics technicians are vital in providing comprehensive care to these individuals [7].

The international community – governments, policy-makers, multi- and bilateral donors and practitioners – must ensure political and resource commitment to tackling nutrition and disability as related issues.

For some children with disabilities as well as for adults with disabilities, there is also a need for disability-specific services which target and address their needs and those of their families or caretakers, including professional special and community-based rehabilitation services where these are available [5].

Key words: malnutrition, disabilities, maternal malnutrition, child malnutrition, adult-and later life malnutrition.