NUTRITIONAL STATUS OF PEOPLE WITH DISABILITIES: CURRENT RESEARCH AND ASSESSMENT

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This review article examines the effect of nutrition on the functional state of an organism with persistent disorders. The assessment of nutrition given in the current research shows that it does not match the needs of such an organism. Statistics for the Russian Federation reveal that the number of disabled people in the country is on an upward trend, which is of high prognostic significance in the context of investigating their nutritional status. Seeking to raise awareness about the nutritional problems of disabled persons in specialized boarding communities, we analyzed research papers on the subject published within the last 20 years. The analysis of works by Russian and foreign authors revealed the need for a unified methodology and scientific substantiation of the nutritional status assessment criteria. We have also found that the assessment of anthropometric indicators in this population is fraught with difficulties: using body mass index (BMI) as the sole measure for diagnosing eating disorders is insufficient. Current scientific literature on nutrition for people with disabilities is diverse and covers a wide range of aspects, highlighting the complexity of the considered problem. Still, the number of studies investigating the features of nutrition and health status of people with chronic diseases is insufficient, which underlines the importance of continuing scientific work in this direction. This will allow for a deeper understanding of the specifics of maintaining an optimal level of health and meeting the nutritional needs of people with disabilities, taking into account existing socio-economic difficulties.

Keywords: disabled person, nutritional status, balanced nutrition, diet, prevention, body mass index, bioelectrical impedance analysis, health

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ПИЩЕВОЙ СТАТУС ЛЮДЕЙ С ОГРАНИЧЕННЫМИ ВОЗМОЖНОСТЯМИ ЗДОРОВЬЯ: СОВРЕМЕННЫЕ ИССЛЕДОВАНИЯ И ОЦЕНКА

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В обзорной статье рассмотрено влияние питания на функциональное состояние организма, имеющего устойчивые нарушения. Оценка фактического питания, представленная в современных исследованиях, демонстрирует несоответствие потребностям организма, имеющего устойчивые нарушения. Учитывая статистические данные по Российской Федерации, наблюдается негативная тенденция увеличения числа людей с инвалидностью, что имеет высокую прогностическую значимость для изучения их пищевого статуса. Нами выполнен анализ научных публикаций за последние 20 лет с целью повышения осведомленности о вопросах питания инвалидов, находящихся под опекой в специализированных домах-интернатах. Изучение работ отечественных и зарубежных авторов демонстрирует необходимость разработки единой методики и научного обоснования критериев оценки пищевого статуса. В ходе работы установлено, что оценка антропометрических показателей у данной группы населения сопряжена с некоторыми трудностями: применение индекса массы тела (ИМТ) в качестве единственного критерия для диагностики нарушений питания оказывается недостаточно эффективным. Современная научная литература, посвященная вопросам питания людей с ограниченными возможностями, отличается многообразием и затрагивает широкий спектр аспектов, подчеркивая сложность рассматриваемой проблемы. Тем не менее, недостаточное количество исследований, направленных на изучение особенностей питания и состояния здоровья людей с хроническими заболеваниями, подчеркивает важность продолжения научной работы в данном направлении. Это позволит глубже разобраться в особенностях поддержания оптимального уровня здоровья и удовлетворения пищевых потребностей инвалидов, принимая во внимание существующие социально-экономические трудности.

Ключевые слова: инвалид, пищевой статус, рациональное питание, рацион, профилактика, индекс массы тела, биоимпедансометрия, здоровье

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A balanced diet plays a key role in maintaining health and preventing nutritional-related diseases. It provides the body with essential nutrients, vitamins and minerals, and supports the proper functioning of all systems and organs. Proper nutrition allows balancing and optimizing consumption of all essential nutrients; it efficiently works to prevent the occurrence of chronic pathologies. According to the World Health Organization (WHO), an unbalanced diet significantly increases the risk of developing various diseases, including cardiovascular, digestive, and endocrine disorders, respiratory conditions, cancers, as well as neuropsychiatric and infectious diseases [1]. The principles of rational nutrition are based on the individual characteristics of the body: age, gender, general state of health, level of physical activity, daily routine specifics, food preferences, and climatic conditions. In addition, rational nutrition factors in the need for proper water intake, alignment of the energy value of food to energy expenditure, optimization of the ratio of proteins, fats and carbohydrates, and prevention of vitamin and mineral deficiencies [2].

Today, some of the key external risk factors for public health are nutritional: lack of fruits and vegetables in the diet, consumption of dishes high in saturated fat, etc. Active longevity largely depends on the correctness of diet, which also involves prevention of alimentary-dependent diseases. It is especially important to study the nutritional status of socially vulnerable populations.

According to Article 1 of the UN Convention, persons with disabilities are those with long-term health conditions that limit their daily activities and social participation, regardless of whether they have been formally recognized as disabled [3]. The problem of population disability is relevant in many countries: according to WHO (2011), about 16% of the world's population are disabled individuals, and 7.5% of them live in the Russian Federation (RF). In 2023, the Federal State Statistics Service reported about 800 thousand disabled Russians, of whom almost 9% suffer from mental illnesses and behavioral abnormalities such as mental retardation and congenital developmental pathologies.

Severe neurological diseases, such as congenital malformations of the brain and cerebral palsy, continue to significantly contribute to disability and largely determine high mortality rates. Various scientific papers have discussed eating disorders peculiar to mental retardation, including cerebral palsy and Down'syndrome. Some of them are insufficient body weight, height abnormalities, lack of protein and energy, deficiency of trace elements, low bone density, and overweight. These disorders are caused by a complex of medical factors — loss of appetite, difficulty swallowing food, gastroesophageal reflux, poor nutrient absorption and constipation, etc. — as well as social conditions, including poor diet, financial constraints preventing provision of quality nutrition, physical disability and cognitive limitations observed in some adult patients with these diagnoses [4].

The nutritional status of people with disabilities determines how well this population eats and how balanced their diet is; there are many social, medical, and economic aspects associated therewith. In people with mental disorders, an unbalanced diet, along with poor housing conditions, is the most important risk factor for the development of chronic diseases [5].

Russian and foreign papers point to the lack of recommendations for people with disabilities that would suggest dietary changes with the aim to improve the overall condition of their health; same papers highlight severe shortage of routine approaches to nutrition of this population [6–8].

Currently, in the Russian Federation, there are no approved, generally accepted, and mandatory methodological guidelines for the diet of people with disabilities, which creates certain difficulties in organizing medical examinations for individuals with persistent health problems [9].

Monitoring of meal services in Russian boarding communities for individuals with disabilities revealed a lack of specially adapted dishes on the menus. The approach to catering there differs from the standard practices only in the caloric value (it is higher) and the frequency of meals in a day [10].

Given that the health of people with disabilities tends to deteriorate, it is important to strengthen the care system with preventive medical routines that help reduce the risk of developing, worsening, or exacerbating nutrition-related pathologies.

MATERIALS AND METHODS

This work is a systematic review of papers published in journals accessible in RSCI (https://elibrary.ru/) and PubMed (https://pubmed.gov/). The period of publication is the past 20 years; the purpose was to raise awareness of nutrition problems faced by individual with disabilities residing in specialized boarding communities.

In view of the lack of specialized programs and regulations addressing this issue, and in order to substantiate the urgency of optimizing the diet of disabled individuals, including those living in specialized boarding communities, we conducted a systematic review of the relevant scientific literature available in abstract databases of randomized controlled trials published between 2000 and 2024.

The 2021 guidelines "Norms of physiological energy and nutritional needs for various groups of the population of the Russian Federation" present the normal amounts of proteins, fats, carbohydrates, vitamins, and minerals, as well as the recommended amounts of food, for a number of populations defined by gender, age, profession, living conditions, etc., but not for people with disabilities [11].

Examinations of the actual diets of people with disabilities revealed significant deviations from current physiological norms: these diets lack essential macro- and micronutrients [12].

Risk factors for the development of alimentary pathologies in people with persistent health problems

The problem of the nutritional status of people with disabilities attracts the attention of many researchers, as it includes aspects of health, nutrition, social integration, and quality of life. They can be considered through the lens of their components: physical limitations, social conditions, concomitant chronic pathologies [13].

As noted in research papers, physical limitations can significantly hinder the ability to cook and receive proper nutrition [14–16].

Studies have shown that a wide range of components that enter the body with food not only condition the functioning of internal organs and physical health, but also affect the individual's emotional state and behavior. In people with mental disorders, the nervous system has certain peculiarities that are closely related to their dietary patterns. Several studies confirm the association of increased consumption of carbohydrates and simple sugars with manifestations of aggression or depression in the patients. In addition, this cohort tends to eat less meat and fish products, which are essential components of a balanced diet [16–18].

The individual's level of physical activity plays a significant role. Recent studies have shown that insufficient physical activity and an unbalanced diet are two key factors contributing to the deterioration of the health of people with disabilities. Combined, they create additional risks for the physical and psychological state of this population. Lack of physical activity reduces metabolic rate, which may contribute to overweight and obesity, particularly when accompanied by a high-calorie diet [18].

Modern nutritional status assessment methods

There are several ways to evaluate a person's nutritional status, like the Quetelet index (body mass index, BMI), which is based on the anthropometric indicators, and the bioimpedance analysis, which examines the body's composition.

Collection and analysis of anthropometric data is a simple approach that yields the protein and energy status of the body in addition to the total body weight. The anthropometric study of body structure includes general indicators such as weight, height, and body surface area, as well as the circumference

of specific parts of the trunk and limbs, and the thickness of skinfolds in certain regions. Indices calculated using BMI have the greatest diagnostic value [19].

The Quetelet-Gould-Kaup index, also known as BMI, is one of the most common tools. It is the ratio of body weight to the square of body height. There are set norms linked to this index, and established connections to a number of serious diseases that should be controlled medically [20]. However, BMI has significant drawbacks: for example, it does not distinguish muscle, fat and bone components of body weight, which reduces its value and limits its use for the diagnosis of certain pathological conditions, since patients with the same BMI may have completely different body composition. For example, on the scale of the nation's population, latent obesity is rather common; it is characterized by excessive body fat amount while the BMI remains within the acceptable range, which makes the index a diagnostic tool not accurate enough.

Like “conventional” obesity, hidden obesity is associated with the increased risk of metabolic syndrome, cardiovascular and other disorders [21].

Bioimpedance analysis is the most accurate way to assess body composition [22]. This method allows determining the level of basal metabolism, the body fluid volume, the development of muscles and subcutaneous fat layer, and enables a detailed segmented examination of the body structure.

The bioimpedance method (BIM) is a non-invasive method that involves measuring the electrical conductivity of biological tissues, thus allowing to evaluate a wide range of morphological and physiological parameters of the body. The indicators analyzed are the active and reactive resistances (bioimpedance) of the human body or its parts at different frequencies. This method allows calculating the body composition parameters and the rate of metabolic processes, which are compared to individual norms. The phenomenon underlying BIM is the electrical conductivity of body tissues that is conditioned by the content of fluids and electrolytes. Thus, impedance measurements yield conclusions about the quantitative ratio of various structural elements of the body [23, 24].

Because of improper diets, people with disabilities often have their body composition changing: fat tissues grow and muscle mass decreases, etc. [25]. BIM helps to track these changes and develop individual nutritional and physical activity plans. The index can also be used to evaluate the effectiveness of these plans when implemented. Regular measurements of body component composition can help monitor the condition of concomitant chronic diseases, such as osteoporosis and cardiovascular diseases, which is important in the context of prevention and timely treatment.

Applying the review findings to improve the dietary patterns of people with disabilities

The reviewed studies help to better understand the difficulties faced by people with disabilities in nutrition-related matters, and focus on an integrated approach to eliminating this problem. Referring to the listed literary sources may be useful in continued investigation of the subject and development of strategies to improve the nutritional status of this population.

Assessment of the nutritional status of people with disabilities is an important and multidimensional scientific problem, and it requires an integrated approach that factors in various criteria — physiological, psychological, medical, and social.

Currently, researchers show significant interest in studying the factors that provoke eating disorders in people with disabilities. At the same time, comprehensive studies dedicated to this subject are extremely rare. The review of the available Russian and foreign papers and analysis of the generally accepted methods for assessing nutritional status allowed arriving at a conclusion that there is a need to develop a universal disorders diagnosing approach and scientifically substantiated assessment criteria that could be used in the process.

In order to obtain a complete picture of the nutritional status and compile personalized therapeutic diets, it is important to add bioimpedance measurements to the examination routine designed for this population of patients.

CONCLUSION

The review allows applying the results to make recommendations for nutrition correction aimed at elimination of the deficiency of key macronutrients and micronutrients in the studied population. Assessment of nutritional status plays a key role in studying the nutritional characteristics of people with persistent health disorders, although the use of only anthropometric methods disallows getting the real picture of the body's condition. Early diagnosing and regular monitoring of nutritional disorders using BIM, which reveals body composition, allow for a more accurate identification of risks of malnutrition, help prevent complications associated therewith, and timely initiate the necessary supportive therapy measures for people with disabilities. The modern literature on nutrition for people with disabilities is diverse and covers various aspects, reflecting the complex nature of the considered problem. However, small number of research papers investigating the nutritional status of people with persistent health disorders, as well as the relevance of this topic, necessitate further research in this area designed to give understanding of how best to support the health and nutritional needs of this population taking into account the social and economic challenges they face.

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