ANTI-AGING NUTRITION THERAPY

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Abstract
This paper examines nutritional therapy’s (NT) critical role in transforming the aging process and challenges the idea that deteriorating health and loss of autonomy are inevitable outcomes. NT is an organized strategy grounded in scientific principles that use tailored dietary modifications to enhance health outcomes and target certain age-related disorders. Essential nutrients substantially strengthen cellular resilience and the ability to withstand oxidative stress, underscoring the need for a varied and comprehensive diet. NT addresses the physiological effects of aging through dietary adjustments, alleviating cognitive deterioration, and managing malnutrition and frailty. This approach fosters an active and independent lifestyle in older adults. In addition to their considerable calcium content, dairy products play a crucial role in anti-aging measures by supplying necessary nutrients. They enhance cognitive health, bolster immunological function, and promote a balanced gut flora, augmenting their capacity to decelerate aging. Microelements, vitamins, and proteins are recognized as crucial components in anti-aging nutrition. The text emphasizes the intricate equilibrium necessary for cellular resilience and the substantial effect of vitamins on diverse anti-aging mechanisms. Consuming protein of higher quality has been demonstrated to be essential for preserving muscle mass and improving overall metabolic function. Advocacy is given to the necessity of a nutritious and well-balanced diet specifically designed to meet the distinct nutritional requirements of elderly individuals. The strategy stresses maintaining a balanced energy intake, selectivity including helpful nutrients, and tailoring the plan to address individual health needs.

Keywords: nutrition therapy; diet therapy; nutritional support; geriatrics; anti-Aging Research; elderly

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Key Messages for Research and Practice

- Nutritional therapy is a game-changing method that battles the inevitability of age-related health deterioration through science-based individualized dietary modifications.
- Dairy products, which are rich in calcium and protein, have a substantial impact on anti-aging approaches, affecting bone health, cognitive function, and gut balance.
- Microelements, vitamins, and protein are emphasized for their essential role in cellular function, underlining the importance of maintaining a balanced intake to counteract age-related damage.
- A customized, nutrient-dense diet is recommended to maintain bone health, increase physiological well-being, and shift the aging narrative.
Introduction

Poor health and diminished independence are not unavoidable outcomes of the aging process. During the stages of aging, certain elements that may be transformed, such as inadequate diet and lack of physical exercise, combine with environmental and genetic variables to determine the decline in the body’s ability to function correctly. This decline raises the likelihood of developing chronic diseases and impairments. Gaining insight into the impact of these elements that can be changed can assist in creating intervention tactics focused on enhancing well-being and preserving independence in elderly individuals [1, 2].

Nutrition therapy (NT) has become a crucial focus in pursuing longer life and improved health, particularly concerning aging. With the increasing global population aging, there is a growing focus on finding efficient ways to reduce the burden of diseases associated with aging. This has prompted researchers and health practitioners to investigate the significant role that dietary items have in influencing the process of aging [3, 4].

Nutrition therapy, also known as medical nutrition therapy (MNT), is a methodical and scientifically supported strategy for controlling and preventing disorders using customized dietary modifications. The underlying principle of NT is to harness the intrinsic potential of food and nutrients to enhance health outcomes and target specific health conditions. In anti-aging, NT is a dynamic instrument for enhancing longevity, vitality, and general wellness [5, 6].

NT is becoming a promising approach in the comprehensive treatment of age-related disorders. NT seeks to carefully manipulate dietary components to modify physiological processes, reduce inflammation, and improve cellular repair mechanisms [7, 8]. NT is a crucial component in the comprehensive treatment of age-related disorders since it can effectively manage diabetes and reduce the likelihood of cognitive decline [9, 10].

The efficacy of NT is dependent on thorough selection and comprehension of the components found in dietary products. Macro and micronutrients, bioactive compounds, and phytochemicals all substantially affect processes within cells and determine the rate of aging. Essential nutrients like omega-3 (n-3) fatty acids, antioxidants, vitamins, and minerals help to boost cellular resilience, resist oxidative stress, and promote regular organ functioning.

Furthermore, bioactive chemicals produced from plant sources have anti-inflammatory and anti-aging characteristics, emphasizing the necessity of a varied and well-rounded diet [11, 12].

This article explores the complex field of NT, its application in different age-related disorders, and the complicated components contributing to its effectiveness. As we explore the connection between nutrition and aging, gaining a more profound comprehension of these principles can completely transform our future approach to health and longevity.

Nutrition Therapy in Geriatrics

As individuals traverse the golden years, the importance of NT becomes increasingly pronounced in ensuring a healthy and fulfilling life during the geriatric phase. NT in geriatrics encompasses a comprehensive and tailored approach that considers the physiological changes associated with aging, the prevalence of chronic conditions, and the imperative to maintain overall well-being [13, 14].

The natural aging process brings about numerous physiological changes that impact the nutritional needs of elderly individuals. Malnutrition and obesity are caused by inadequate, unbalanced, and unhealthy dietary patterns, constipation, decreased metabolic rates, modifications in body composition, and changes in food absorption, which contribute to a changing nutritional environment. The older individual is experiencing challenges with eating caused by dental problems and difficulty swallowing due to the relaxation of the pharyngeal muscles. Additionally, there is a decrease in the rate at which the stomach empties due to a prolonged feeling of fullness, resulting in a reduced desire to eat. Hence, NT in geriatrics endeavors to tackle these alterations by modifying dietary guidelines to cater to the distinct requirements of aged persons [15].

Elderly individuals frequently experience a higher occurrence of chronic diseases, including cardiovascular disease, diabetes, and osteoporosis [16]. NT is being recognized as a powerful tool in treating and preventing various diseases. Based on evidence-based methods, customized dietary therapies can effectively manage blood pressure, regulate blood sugar levels, and enhance bone health [17, 18]. Furthermore, nutrition has a crucial role in immunological function, aiding the ability to battle infections and lessen the severity of disorders typically experienced in older individuals [19].
The deterioration in cognitive function is a significant issue in the field of geriatrics, with diseases such as Alzheimer’s disease affecting a significant proportion of the elderly population [20]. NT impacts cognitive function, as particular dietary patterns and specific nutrients have neuroprotective characteristics. N-3 fatty acids, antioxidants, and vitamins are essential diet elements that promote brain health. They can help maintain cognitive function and reduce the likelihood of developing neurodegenerative diseases [21, 22].

Malnutrition and frailty are common issues in geriatrics, and they have significant consequences for the general well-being and quality of life [23]. NT addresses these challenges by emphasizing nutrient-dense foods, sufficient protein consumption, and tailored tactics to target specific nutrient deficiencies. The objectives of NFTs include avoiding the development of malnutrition, preserving muscle mass and autonomy in function, and preventing obesity. These features are crucial for promoting an active and independent lifestyle as one ages [24, 25].

**Anti-Aging Dairy Products**

In the pursuit of effective anti-aging strategies, the role of dairy products has gained prominence as a nutritional elixir that offers a wealth of essential nutrients with potential anti-aging properties. One of the critical benefits of dairy products for anti-aging is their high calcium content [26]. Calcium is not only essential for bone health, but it also plays a vital role in preventing osteoporosis, a prevalent issue among the elderly. Adequate calcium intake from dairy products offers the necessary building blocks for bone density, lowering the risk of fracture and promoting skeletal integrity as the body ages [27].

Protein, an essential muscle health and repair component, is abundant in dairy products. As people age, preserving muscle mass becomes critical in battling weakness and sustaining independence in daily life. Dairy contains high-quality protein, including key amino acids, which promote muscle protein synthesis and can help offset age-related muscle loss. Regular dairy consumption becomes an effective strategy in reinforcing the body against the negative consequences of sarcopenia [28].

Dairy products provide a variety of vitamins and antioxidants, which further enhance their ability to slow down the aging process. Vitamin D, commonly included in dairy products, has a crucial impact on bone health and immune system function and has been associated with increased lifespan [29]. In addition, dairy products involve selenium and zinc, which help to counteract oxidative stress, a significant factor in aging [30].

Yogurt and other dairy products include probiotics and beneficial bacteria that promote a healthy gut. The complex relationship between gut health and aging is a rapidly growing field of study. Dairy products containing probiotics promote a harmonious gut flora, which can affect digestive health and potentially influence systemic inflammation and immunological function. Maintaining a healthy gut environment is becoming more widely acknowledged due to its ability to influence aging and enhance longevity [31, 32].

**Anti-Aging Microelements, Vitamins, and Proteins**

Within the complex realm of anti-aging nutrition, microelements, vitamins, and protein emerge as crucial and essential components. These essential nutrients are fundamental to the functioning of cells, repair processes, and overall physical resilience, providing a strong basis for maintaining an active and healthy aging process [33].

Microelements are vital substances that the body needs for different metabolic activities. Zinc, selenium, copper, and iron are identified as crucial factors in anti-aging mechanisms. Zinc is crucial in DNA synthesis and repair, immunological function, and antioxidative mechanisms. Selenium, a constituent of selenoproteins, functions as a powerful antioxidant, safeguarding cells from oxidative stress, a characteristic feature of the aging process. Copper plays a role in the synthesis of collagen, which is essential for maintaining skin flexibility, while iron is involved in transporting oxygen and creating energy. Ensuring these trace elements’ precise equilibrium and ideal consumption is crucial for bolstering cellular durability and reducing age-related harm [34].

Vitamins are necessary for various physiological processes and significantly and profoundly impact anti-aging actions. Vitamin C, a powerful antioxidant, counteracts free radicals, promotes collagen production, and enhances skin suppleness. Vitamin E, another antioxidant, protects cell membranes from oxidative harm. The B-vitamin complex, which comprises B6, B12, and folic acid, impacts cognitive function, the formation of red blood cells, and the repair of DNA. Vitamin D, essential for the absorption of calcium and the health of bones, has been associated with immunological regulation and longevity. The complex interaction
of vitamins in the mechanisms that combat aging highlights the significance of maintaining a diet that is both varied and nutritionally balanced [35, 36].

Protein, composed of amino acids, is the fundamental component of cellular structures, enzymes, and hormones. Protein is crucial in anti-aging by retaining muscle mass, facilitating tissue regeneration, and enhancing overall metabolic performance. Essential amino acids, acquired via dietary protein, are especially crucial as the body lacks the ability to synthesize them independently. In the context of anti-aging, it is crucial to strategically incorporate high-quality protein sources to achieve optimal cellular function and resistance [37, 38].

**Healthy Diet for Elderly Subjects**

As people age, a well-rounded and nutrient-dense diet becomes even more critical for maintaining optimal health, boosting vitality, and addressing age-related issues. Creating a balanced diet for the elderly requires a complex strategy that satisfies unique nutritional needs, analyzes probable health concerns, and promotes general health. The assessment of energy consumption and expenditure, along with other lifestyle and biological aspects, has been identified as key elements influencing one’s health [39]. A balance in energy intake and expenditure is linked to a decreased susceptibility to chronic diseases [40]. A diet that is rich in monounsaturated fatty acids, antioxidants, and polyphenols can also contribute to the promotion of healthy and effective aging [41]. Specifically, there is a strong connection between inflammation, oxidative stress, and the aging process, which is influenced to some extent by the nutritional state of older individuals [42].

Sufficient protein consumption is crucial for preserving muscle mass, enhancing immunological function, and expediting wound healing. Incorporating protein-rich foods like poultry, fish, legumes, and dairy products into meals is essential for mitigating the age-related decrease in muscle mass. Protein consumption is among the various factors associated with sarcopenia, frailty, and physical impairment [43]. Increasingly, research suggests that consuming protein in amounts beyond the recommended dietary allowance of 0.8 g/kg/day is linked to improved athletic ability, maintenance of muscle mass, and a decreased likelihood of physical disease. It is thus advised to modify the protein recommendation to a higher dosage of 1.0-1.2 g/kg/day [44, 45]. Aside from protein instructions, numerous studies have documented the correlation between muscle mass and performance and the impact of specific nutrients like fish-derived n-3 polyunsaturated fatty acids [46, 47]. Considering the link between sarcopenia, heightened inflammatory reactions, and disrupted glucose regulation, evidence supports the use of n-3 polyunsaturated fatty acids as a potential preventive or therapeutic measure for sarcopenia due to their anti-inflammatory qualities [48].

Sufficient consumption of calcium and vitamin D is crucial for preserving bone health and minimizing the likelihood of fractures. Dairy products, such as milk and cheese, green leafy vegetables, and oily fish, are exceptional suppliers of these essential nutrients, crucial for maintaining healthy bones and overall physical mobility [49, 50].

Adequate hydration is crucial for the physiological aging process. Dehydration is recognized to be linked with elevated rates of hospital stay, complications, and loss of life. Older individuals are prone to dehydration due to physiological and cognitive alterations that occur throughout the latter stages of life [51, 52]. Gender-specific guideline recommendations for fluid consumption are provided, with a recommended intake of 2.0 liters per day for females and 2.5 liters per day for males [53]. Additionally, there are slightly lower recommendations of 1.6 liters per day for females and 2.0 liters per day for males [51, 54].

One’s diet should be customized to suit their nutritional requirements and limitations. Certain elderly individuals may have particular health issues or dietary limitations that require thorough evaluation. Seeking advice from a qualified healthcare practitioner and a knowledgeable dietitian will assist in developing a tailored and efficient dietary regimen.

The Mediterranean Diet consists primarily of traditional foods and beverages, many of which are homemade and are typical of the nations bordering the coast of the Mediterranean. In recent decades, it has been advocated globally as the healthiest nutritional style, with an elevated intake of whole grains, vegetables, fruits, and olive oil, medium use of dairy products and wine, and limited meat consumption [55]. This dietary pattern has demonstrated preventive effects and supports healthy aging [56].

The results indicate that adhering to the Mediterranean Diet has a beneficial impact on both short-term and long-term cognitive function in both older individuals with cognitive disorders and those who are healthy, with a particular emphasis on memory [57].
Conclusion

NT is gaining prominence as a powerful tool, providing a dynamic approach to address age-related disorders and enhance general health (Figure 1). By acknowledging the influence of adjustable factors like nutrition and exercise, we are empowered to redefine the narrative surrounding aging. An assorted and well-rounded diet grounded in scientific principles is increasingly recognized as essential for promoting resilience and maintaining optimal health as one age.

Figure 1. Healthy diet for elderly subjects

The emphasis on dairy products highlights a complex combination of nutrients that extend beyond conventional roles. In addition to promoting bone health, dairy products also enhance cognitive health, boost immunological function, and maintain a healthy balance of gut flora. Microelements, vitamins, and protein are essential components that play a crucial role in maintaining cellular function and general resilience. The combination of these elements resonates across the longevity pathways, enhancing the well-being and restoration of cells. Optimal health relies on maintaining a balanced energy intake, ensuring sufficient protein consumption, and deliberately consuming essential nutrients. Hydration has a vital function as the fundamental basis of physiological well-being.

Coupled with the knowledge of dietary insights, we set a path toward a future where aging is not a decline but a journey characterized by the pursuit of strength, prosperity, and improved health. The concept of conscious nutrition provides clear guidance, shedding light on a road where individuals can gracefully age, challenge conventional limitations, and ultimately embrace the richness of a fulfilling life throughout all human existence.

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CONFLICTS OF INTEREST
None declared

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