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Review Article

A Perspective Studies: Nutritional Interventions and their Impact on Geriatric Health Outcomes

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ABSTRACT
Age reaching an average life span of human beings is known as old age. There is no exact meaning or definition for old age. During aging, malnutrition is complex and multifactorial. Nutritional interventions have become increasingly important in the field of geriatric healthcare, as the aging population faces a higher risk of malnutrition and related health outcomes. The present review studies aim to synthesize the current evidence on the impact of various nutritional interventions that improves optimal health and well- being of older adults.

Keywords: Geriatric, Nutritional, Intervention, Supplements, Challenges and consideration.

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INTRODUCTION

Nutritional Interventions refers to the process of providing specific food, nutrients or dietary modifications to meet the unique nutritional needs and improve the well-being of older adults. With the aging global population, ensuring the health and well-being of older adults has become a critical public health priority. Nutritional interventions play a pivotal role in managing and improving health outcomes among the elderly. These interventions can address common age- related nutritional deficiencies, enhance the management of chronic diseases and ultimately improves the quality of life.[1] This article reviews the types of nutritional interventions and their impacts on geriatric health outcomes, providing evidence from recent research (As given in Table 1).

Dietary Management goals and objectives

Though good nutrition plays a key role in every stage of life, it is very important during old age as nutritional deficiencies are more likely to occur at this stage.[8] So, main objectives are:

- To maintain nutritional status with balanced diet.
- To prevent excess fat accumulation and sodium intake and manage chronic conditions like Diabetes, Hypertension.
- To preserve lean body mass.
- To support bone and oral health.
- To enhance immune and digestive function.
- To improve quality of life.

Wellness in aging

Wellness in aging refers to reduce the ill effects of aging or having healthy aging. Nutritional deficiencies are the main reason for various health issues in geriatrics. Consumption of a good balanced diet with nutrient variety - dense food items, macro and micro nutrients, at least five servings of fruits and vegetables daily, fiber with considerable amount of physical activity helps to maximize quality of life. Maintenance of hydration is encouraged with at least 6-8 glasses of water daily, unless contraindicated by medical conditions. Maintaining physical, social and psychological health, being active and not being dependent on family and society are goals of healthy aging (Table 2).[9]

Challenges and considerations in nutritional interventions

As nutritional interventions hold significant promise for improving health outcomes among geriatrics, several challenges and considerations must be addressed to ensure their effectiveness (Table 3).

Long term adherence

Outcome of a nutritional therapy or intervention is primarily determined by the Adherence. Academic findings show variations in levels of adherence to Oral Nutritional Supplements

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Table 1: Types of Nutritional interventions for geriatrics.

Sl. No.	Type of nutrition	Importance	Evidence
1.	Vitamin D and Calcium.	Both the nutrients are critical for maintaining bone health and preventing fractures and osteoporosis, which are common in older adults.	A randomized controlled trial studies demonstrated that combination of Vitamin D and Calcium supplementation reduced the hip fracture risks in older women by 43%.[2]
2.	Vitamin B (B_6, B_{12}, B_9).	These vitamins are essential for the health of brain and can also help to prevent cognitive decline and anemia.	It was found that the Vitamins B supplementation slow down the rate of brain atrophy with mild cognitive impairment in older adults.[3]
3.	Omega-3 fatty acids.	Omega-3 fatty acids possess anti-inflammatory properties and contribute to cardiovascular and cognitive health.	It was found that Supplements with Omega-3 can reduce the cardiovascular events risk and improves cognitive health in older adults.[4]
4.	Vitamins A, C, E (Antioxidants).	These vitamins help to prevent oxidative stress in cells that is associated with aging and various chronic diseases.	It was found that antioxidants with higher doses were associated with lower risk of developing Alzheimer's disease.[5]
5.	Fiber	Adequate intake of fiber exhibits digestive health regulates blood sugar levels and lowers cholesterol.	A study indicated that higher intake of fiber was linked to a reduced cardiovascular disease risk and improved digestive health in geriatrics.[6]
6.	Protein Supplementation	Protein supplementation can help to counteract the process of Sarcopenia, a gradual loss of muscle mass and strength with aging.	Studies have shown that elevated protein intake is attributed to improved muscle mass and functions in older adults.[7]

Table 2: Impact of Varying Supplement Dosages on Elderly health.

Nutrient Supplement	Dosage	Outcomes
Vitamin D_3 and Calcium	≥800 IU daily	Avoidance of hip and non-vertebral fracture.[10]
	1000 mg Ca+800 IU vitamin D_3.	Avoidance of Bone loss in ambulatory postmenopausal women.[11]
Vitamin B	0.8 mg Vitamin B_9+20 mg vitamin B_6+0.5 mg vitamin B_{12} daily.	Accelerated rate of brain atrophy lowers down in elderly with mild cognitive impairment.[12]
	400 µg Vitamin B_9+ 100 µg vitamin B_{12} daily.	It improves cognitive functioning among elderly.[13]
	20 to 40 mg citalopram+2 mg Vitamin B_9+0.5 mg vitamin B_{12}+25 mg vitamin B_6.	Relapse of depressive symptoms decreases.[14]
Zinc	10 mg per day zinc asparate.	Lowering of AGE plasma levels i.e advanced glycation end products that stimulate reactive oxygen species resulting into atherosclerosis. Increased intracellular zinc ion availability.[15]
	30 mg per da	Plasma Zn concentration increases T cell increases hence increase in T cell function.[16]
Proteins and amino acids	800 IU vitamin D_3+20 g Whey protein+3 g leucine.	In Sarcopenia older people, it improves muscle mass and lowers extremity function.[17]
	15 g protein per day.	Along with protein supplement and resistance exercise there is no additional muscle mass, strength and physical function increase.[18]
	2 g twice a day oral EAA.	Improves physical performance. Improves depressive symptoms. Improves muscle function.[19]

Table 3: Challenges and considerations in nutritional interventions for geriatrics.

Sl. No.	Challenges	Considerations to be
1.	Physiological changes like ADME rate.	Tailoring nutrient intake that accommodate metabolic rates like adequate protein and micronutrients.[19]
2.	Socioeconomic factors with limited financial resources.	Affordability and accessibility by following nutritional programmes.[20]
3.	Dental and oral health issues.	Regular dental check-ups and softer food or easy-to-chew food to be offered.[21]
4.	Cognitive decline.	Easy to follow meal plans and support from caregivers.[22]
5.	Chronic diseases and medications like diabetes, CVS, etc.,	Nutritional interventions must be compatible with medical treatments and medication, so that the drug may not interfere with nutrient absorption.[23]
6.	Social isolation	Promote social interactions by encouraging community dining or group meal program may improve overall mental health.[24]

(ONS); that range from lower than desirable to good. There will be increase in the effectiveness by optimizing adherence to the prescribed level.

Social Interaction

Reduced social connections and physical movement, greater social isolation in older adults has been credited as a contributing factor to under nutrition in geriatrics.

CONCLUSION

Besides providing similar advice for all old people, it is more effective to individualized dietary counseling by which people are guided to put healthy foods and lifestyles into practice. As because there is great variation among them in terms of biological age, nutritional status and disease conditions.[25] Its all due to Physiological, pathological and socioeconomic changes that occurs in old age.[26] Hence, promoting optimal nutritional status is a key to improving longevity and quality of life among elders.[27]

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

AGEs: Advanced Glycation End products; **EAA:** Essential Amino Acids; **IU:** International Unit; **ONS:** Oral Nutritional Supplements; **ADME:** Absorption Distribution Metabolism and Excretion; **CVS:** Cardio Vascular System.

SUMMARY

This review discusses different types of nutritional interventions for geriatrics, important nutrition supplements with their doses and functions. It also addresses the challenges and their considerations for implementing nutritional interventions in geriatric health. Nutritional interventions play a significant role in enhancing the health and well-being of the elderly people. By addressing the specific nutritional needs of older adults, these interventions can mitigate age- related health issues, improve physical and cognitive function and enhance overall quality of life.

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