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Nutrition for Optimal Health, Energy, and Longevity in old Age people.

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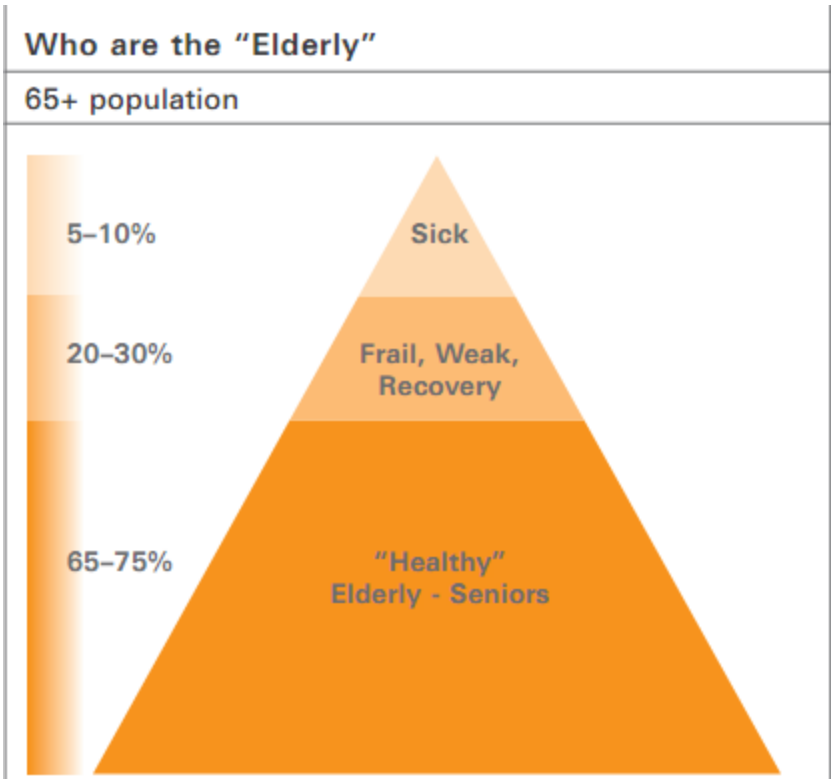
ABSTRACT

The over-sixties make up the fastest growing segment of the population in most countries. Although life expectancy has also increased dramatically over the last 100 years, this segment of the population is susceptible to many health risks from a poor diet. Evidence from various sources indicates that many older people fail to get the amounts and types of food necessary to meet essential energy and nutrient needs. There are numerous reasons why older people might not be getting the most nutritious diet Assessment of nutritional status is essential for preventing or maintaining a chronic disease and for healing . Knowing the causes of changing nutritional needs and dietary preferences is needed to understand a patient's nutritional status . The nutrient requirements for older adults include increased in take of vitamins D, B12 and B6 and calcium. An old Age individual needs to balance energy intake with his or her level of physical activity to avoid storing excess body fat . Dietary practices and food choices are related to wellness and affect health, fitness, weight management, and the prevention of chronic diseases such as osteoporosis, cardiovascular diseases, cancer , and diabetes .the present Article Reviews the role of balanced Nutrition for old Age Persons.

Keywords: Geriatric Nutrition, balance diet, nutritional status.

INTRODUCTION

Nutritional needs change throughout life . For the elderly, these changes may be related to normal aging processes, medical conditions, or lifestyles . Assessment of nutritional status is essential for preventing or maintaining a chronic disease and for healing . Knowing the causes of changing nutritional needs and dietary preferences is needed to understand a patient's nutritional status . In order to meet the nutritional needs, consideration must be given to more than just diet . The overall nutritional requirements of the older adult do not change . What does change is the caloric intake . Because of the loss of lean muscle mass, the overall caloric intake requirement decreases while the need for other nutrients remains relatively unchanged . This makes eating nutrient-dense foods even more important for older adults . The nutrient requirements for older adults include increased intake of vitamins D, B12 and B6 and calcium. An old Age individual needs to balance energy intake with his or her level of physical activity to avoid storing excess body fat . Dietary practices and food choices are related to wellness and affect health, fitness, weight management, and the prevention of chronic diseases such as osteoporosis, cardiovascular diseases, cancer , and diabetes



Nutrition and Age-Related Changes

As people age, multiple changes occur that affect the nutritional status of an individual . Sacropenia, or the loss of lean muscle mass, can lead to a gain in body fat that may not be apparent by measuring body weight . It may be more noticeable by loss of strength, functional decline, and poor endurance . This loss also leads to reduced total body water content .Another common loss related to aging is changes in bone density, which can increase the risk for osteoporosis Many changes occur throughout the digestive system . A decrease in saliva production xerostomia and changes in dentition alter the ability to chew and may lead to changes in food choices . There is a decrease in gastric acid secretion that can limit the absorption of iron and vitamin B12 . Peristalsis is slower and constipation may be an issue because fluid intake is decreased . Appetite and thirst dysregulation also occur, leading to early satiety and a blunted thirst mechanism Sensory changes affect the appetite in several ways . Vision loss makes shopping, preparing food, and even eating more difficult . Diminished taste and smell take away the appeal of many foods and may lead to preparing or consuming food that is no longer safe . Many other factors that are not necessarily part of the normal aging processes, but are often related to aging, create changes in appetite, what foods are chosen for meals, and the overall nutrition of the individual . Sedentary lifestyle, social isolation, loneliness, or depression can lead to malnourishment .

Medications can also change how nutrients are absorbed or how food tastes . Poverty and cognitive impairment are other issues that may affect eating habits and food choices .Changes in Nutritional Needs. The overall nutritional requirements of the older adult do not change . What does change is the caloric intake . Because of the loss of lean muscle mass, the overall caloric intake requirement decreases while the need for other nutrients remains relatively unchanged . This makes eating nutrient-dense foods even more important for older adults . The nutrient requirements for older adults include increased intake of vitaminsD,B12, and B6 and calcium.Of these, vitamin B12 is recommended exclusively to those over the age of 50 as a supplement because of the decreased absorption rate . Vitamin B12 deficiency can be responsible for depression, neurological disorders, and macrocytic anemia .

Protein is a nutrient that is often thought of as one to increase in aging . Unless the older adult requires additional protein for healing and strength, this is not necessarily the case . Because of the overall decrease in muscle mass, the recommended daily allowance does not suggest increasing protein requirements in the elderly .

How much do nutritional needs for seniors differ from those of younger adults?

Most nutritional requirements remain about the same, but energy needs decrease. People in the older age groups should choose foods with high nutrient density. Energy needs decrease with age because the lean body mass decreases and the overall level of activity usually decreases as well. Calorie needs depend on activity level as well as on body weight and composition, so obviously a person who is confined to bed needs less than a person who is mobile. The higher the lean body mass, the more a person can eat without gaining weight and the more likely he or she will be to get adequate supplies of nutrients from dailymeals. The body needs about 1.5 times the basal energy expenditure per day. There is a 10%reduction in this caloric need between the ages of 50 and 75 with an additional 10-15% reduction after 75, depending on individual activity.

The European Union's 2004 Nutri-Senex report gives the following macro-nutrient recommendations for Old AGE Persons :

Energy measured in k/cal : Men – 2,300, Women 1,800

Protein 0.8–1.0g pro/kg body weight and about 12–14% of total k/cal

Fats no more than 10% from saturated fat.
(Dietary cholesterol: no more than 300mg per day)
Carbohydrates: minimum 50–100g per day At least 50% of total calories should come from complex carbohydrate sources.
Fibre: 20–35 g per day
Vitamin A needs decrease, so vitamin A in the form of supplements should be avoided. Requirements should be covered by varied foodchoices.
Vitamin D needs increase, so exposure to sunlight is recommended and vitamin D-rich foods such as fish and fortified skim milk should be part of the diet.
Vitamin B12 needs increase. This vitamin, extremely important for brain function, is found in lean red meat, chicken and skim milk. In fact all vitamins of the B group are important with advancing years.
Folate is not required in higher doses than for younger adults. It is commonly found in green vegetables, liver and yeast.
Chromium needs increase. Whole grain cereals and brewers' yeast are good sources.
Zinc needs increase. Foods rich in zinc are red meat, oysters, wheat germ and whole grains.
Water at least 6-8 glasses daily
Calcium
In old age, calcium is less well absorbed, due to alterations in vitamin D metabolism. Many post-menopausal women do not get their 1000mg daily intake, or three servings of calcium-rich foods per day.Many studies even recommend 1500 mg per day. It is recommended that older people who are lactose intolerant or allergic to milk, look for special foods such as black molasses (treacle) or other non-milk sources or supplements to complete daily requirements.
Some common health concerns among the ageing population are as follows-
Infections are common in old age, and in many cases fatal. Specialised nutrition can help to boost individual immune function to some extent.
As people age, immune function diminishes in different ways. For example, there can be a decreased antibody response to vaccines such as the 'flu vaccine. There are also decreased cell mediated immune responses (decreased T-cell responses). With ageing there is also an almost permanent activation of macrophages – the cells that destroy foreign material - and an important increase in the production of radicals derived from oxygen, leading to chronic oxidative stress.
Many nutritional deficiencies in elderly have been associated with decreased immunity. Dietary antioxidants such as vitamins A, C, and E are believed to be of particular importance due to their stabilizing effect on cell membranes and the prevention of damage by free radicals. Vitamin E in particular enhances the immune response in elderly [4] Minerals such as iron, zinc, selenium and copper are needed for enzymes to neutralize free radicals. The combination of zinc and selenium lowers the incidence of respiratory and urinary infections and enhances the antibody response to the 'flu vaccine [5]. Probiotics – beneficial intestinal bacteria – have been clinically shown to boost immune properties in elderly. A study by the Department of Medicine of the University of Chile, to test the effects of a nutritional supplement on the immune response and cytokine production of free living Chilean elderly people, demonstrated increased innate immunity and protection against infections [15] Dr. D. Bunout and colleagues concluded that the nutritional supplement, containing a combination of micronutrients (vit. E, B12),probiotics and prebiotic fibres did indeed have this effect of reducing the incidence of infections in elderly people.
As people age, protein metabolism also slows, and the rate of replacement of specific aminoacids therefore also declines, leading to less efficient immune function and/or response to infection or trauma [6.]
High alcohol consumption and vitamin and zinc deficiency negatively affect the brain. Vitamins of the B group and fish oils are promising components against cognitive decline, Recently, scientists from the Karolinska University Hospital Huddinge in Sweden reported that omega-3 fatty acid supplementation, mainly DHA (docosahexaenoic acid) may slow mental decline in people with very mild Alzheimer's disease [7] Folicacid, has also been shown to slow cognitivedecline in people over 50. Caffeine is a substance that has been been shown to improve mood and reduce anxiety.
Gastric problems and Vitamin B12 Vitamin B12 deficiency is high among the elderly often because atrophic gastritis (or a previous history of gastric surgery) decreases the production of the acid and digestive enzymes needed to disconnect protein-bound vitamin B12 from the natural chemical form of vitamin B12 found in meat, poultry, fish and dairy foods. Between 5and 20% of older adults have some degree of B12 deficiency. Clinical trials indicate that an oral dose of 500microg/d of crystalline vitamin B12 is needed to reverse biochemical signs of vitamin B12 deficiency in older adults [8.] Weight management Although we have spoken mainly about the frail elderly in this publication, some older people are overweight or obese for a number of reasons including sedentary lifestyle. The primary nutritional problems affecting this sector of the population are excess energy intake, and mild vitamin and trace mineral deficiencies. Obesity makes breathing more difficult and aggravates many chronic diseases. Heavier women, on the other hand, are less susceptible to hip fractures. This is not only because of the added 'padding' and stronger muscles, but also to potentially higher oestrogen levels from the conversion of precursor steroids to oestrogen in fat tissue [6.] Weight management Although we have spoken mainly about the frail elderly in this publication, some older people are overweight or obese for a number of reasons including sedentary lifestyle. The primary nutritional problems affecting this sector of the population are excess energy intake, and mild vitamin and trace mineral deficiencies. Obesity makesbreathing more difficult and aggravates many chronic diseases. Heavier women, on the other hand, are less susceptible to hip fractures. This is not only because of the added 'padding' and stronger muscles, but also to potentially higher oestrogen levels from the conversion of precursorsteroids to oestrogen in fat tissue [6.]
Healthy eating recommendations for older Adults
Although older adults need fewer total calories,they have an increased need for certain vitamins and minerals. This increased need must therefore be satisfied with a lower overall intake. It is especially important for seniors to eat foods rich in nutrients such as vegetables and fruits, whole grains, lean meat, fish, poultry, low-fat milk and dairy

products, nuts and seeds. Sweets and alcohol should be limited, but not excluded, as a good healthy diet should also give as much pleasure as possible within reasonable limits.

Vegetables and Fruit

A British study [3] to assess the levels of vegetable and fruit consumption in elderly people, and to examine the socio-economic, physical and psychological factors which influence this consumption, revealed that of the 445 people aged 65+ observed, less than half of the respondents achieved the target of five portions of fruit and vegetables per day, (37% of those in urban areas and 51% of those in rural areas). The profile of the low fruit and vegetable consumer was male,

a smoker, and someone with low levels of social engagement. The study concluded that most fruit and vegetable campaigns were not reaching the targeted elderly, and those particularly at risk of low consumption. Findings may be extrapolated to similar areas of the world.

Present in fruit and vegetables, phytochemicals, also known as phytonutrients, are plant-based compounds with a number of physiological functions. They include phenolic phytochemicals,(flavonoids, tannins, stilbenes and lignans),carotenoids, phytosterols, and sulphur-containing compounds (sulphides and glucosinolates). Phytochemicals can have beneficial effects in a range of diseases including cardiovascular disease and cancer, as well as immune function. Knowledge is still incomplete about their metabolism, bioavailability, mode of action, dose response and in some cases, the actual compounds responsible for the health benefit [6.] The antioxidants present in many foods, but particularly in fruit and vegetables help to counteract chronic inflammation, a risk for the onset of various degenerative diseases.

Vegetables are far richer in useful nutrients than fruits, but fruits are pleasant to eat, so better accepted in health campaigns.

A micronutrient strongly associated with eye health is lutein. This carotenoid extracted from Marigold flowers is claimed to have stronger antioxidant activity than beta-carotene and lycopene. It is safe at all recommended doses, and could protect against damage to the eyes through the ageing process. for the health benefit [6]. The antioxidants present in many foods, but particularly in fruit and vegetables help to counteract chronic inflammation, a risk for the onset of various degenerative diseases.

Vegetables are far richer in useful nutrients than fruits, but fruits are pleasant to eat, so better accepted in health campaigns.

Protein

The importance of protein, especially in the elderly

Protein is an essential macronutrient that must be consumed in the diet throughout life. The reasonfor this is that 8 of its total of 20 constituentamino acids (the basic units that are linked Together to form proteins) cannot be made by the body from other metabolites and, therefore, have to be obtained from food. For this reason they are referred to as essential amino acids. The amino acids are: leucine, valine, isoleucine, tryptophan, phenylalanine, threonine, methionine and lysine. In addition to these, 6 other amino acids are considered as semi-essential because although the body is capable of synthesizing them from other metabolites, the amount that can be produced may not always be sufficient to satisfy needs in specific situations (such as during an infection). These semi-essential amino acids are cysteine, tyrosine, arginine, histidine and glutamine. The remaining 6 (glycine, alanine,proline, asparagine, aspartate and glutamate) can always be synthesised in adequate amounts. Protein is required for many specific functions in the body, the overall purpose being to build and maintain the tissues of the body - both struc-turally (as in the case of muscle, connective tissue, blood vessels, skin and internal organs) and functionally (such as digestive enzymes, metabolic enzymes, haemoglobin, antibodies and peptide hormones).

Protein needs, expressed per kg body weight change little during adult life (recommended dietary intake for adults above the age of 18 years are 0.8 g dietary protein per kg body weight). However, with increasing age there is a commensurate decrease in the efficiency of digestion, a gradual but continuous decrease in muscle mass (muscle wasting) and an increase in the risk of infection – all of which require higher protein levels to overcome or compensate for them Although there are currently insufficient data to establish an adequate protein allowance specifically for older persons, it is suggested that the recommendation for protein intake for older people should be increased by around 10%–20% (i.e. be between 0.9–1.0 g protein per kg body weight instead of the current 0.8g per kg body weight for all adults above the age of 18 years.

In fact a 10-year longitudinal study [11] in initially healthy elderly women showed that women who habitually consumed greater than 1.2g protein per kg body weight developed fewer health problems than those who consumed the recommended value of 0.8g.

Macronutrients: Recommended Intakes for Different Age Groups ♂ ♀

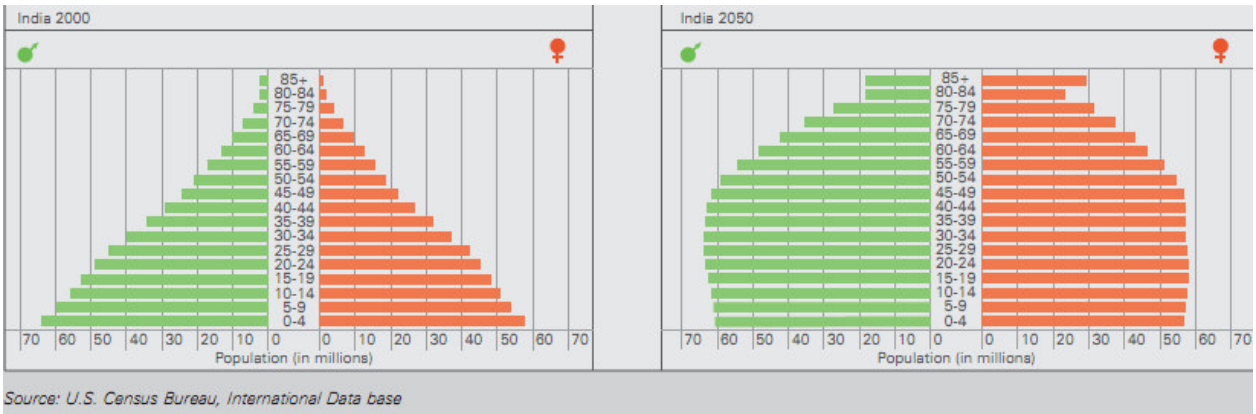
Life stage	Total water (L/d)		Carbohydrates (g/d)		Total fibre (g/d)		Protein (g/d)	
19–30 yrs	3.7	2.7	130	130	38	25	56	46
31–50 yrs	3.7	2.7	130	130	38	25	56	46
51–70 yrs	3.7	2.7	130	130	30	21	56	46
> 70 yrs	3.7	2.7	130	130	30	21	56	46

Micronutrients: Recommended Intakes for Different Age Groups

Life stage	Vit A (uμ/d)		Vit D (uμ/d)		Vit B12 (uμ/d)		Folate (uμ/d)		Chromium (uμ/d)		Copper (uμ/d)		Zinc (uμ/d)	
19–30 yrs	900	700	5	5	2.4	2.4	400	400	35	25	900	900	11	8
31–50 yrs	900	700	5	5	2.4	2.4	400	400	35	25	900	900	11	8
51–70 yrs	900	700	10	10	2.4	2.4	400	400	30	20	900	900	11	8
> 70 yrs	900	700	15	15	2.4	2.4	400	400	30	20	900	900	11	8

The Demographics of Ageing

The following charts show the populations of India from the year 2000 compared to provisions for in 2050. The charts show the increasing cohorts of older people to be cared for in the coming years



The charts show the increasing cohorts of older people to be cared for in the coming years[1]

CONCLUSION

Although our lifespan is to a major extent genetically defined, the probability of reaching that lifespan in good health seems to be heavily influenced by environmental and lifestyle factors, especially diet. The frail elderly population can suffer from osteoarthritis, osteoporosis, digestive malapsorption, muscle weakness, loss of cognitivefunction and sensory impairment as part of the 'normal' ageing process.

When to these factors are added physical,psychological and emotional stress, the risks increase sharply for compromised immune system, worsened inflammatory status, weight loss, generalised weakness, and all too often, thoughts of imminent decline,which can also negatively influence recovery.Without overestimating our impact on certain factors of ageing.

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