AGING AND HEALTH MANAGEMENT OF THE ELDERLY POPULATION THROUGH NUTRITIONAL EDUCATION

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Abstract
Worldwide, statistical reports have shown that there is a steady growth in the number of persons considered as elderly or aged in the society. Based on the report of the World Health Organization (WHO), most developed countries of the world use 65 years of age and above for the elderly and older population. The age for retirement by which majority of civil servants in Nigeria retire from secular employment hovers around the age of 65. Granted, old age or aging comes with its peculiar challenges. Critical to the welfare of the elderly population is meeting their nutritional requirements in order for the population to achieve healthy aging process. To this end, a good view of what aging entails coupled with how best it could be managed through nutritional education becomes imperative. This paper examined the process of aging with its hallmarks vis-à-vis, the scientific causes of aging along with some common anti-aging nutrition / life styles suppressors, consequences of aging and some ways of achieving healthy or rather good aging through proper nutrition. Based on the conclusion, it was recommended that, members of the elderly population be properly educated in the nutritional management of their health in order for them to consider prioritizing the consumption of more balanced diets, vital nutrients filled foods and less of calories stuffed diets. Besides nutrition, living a good lifestyle was also promoted.

Key words: Aging, Nutritional Management, Aging Population, Healthy Lifestyle, Healthy Aging.

Introduction
The young, vibrant in health and the youthful today will forever wish that they will never have to grow old someday. But sadly and inevitably reality will eventually set in sooner than later – aging process and old age. This thought drives home the point that everyone, regardless of status, in one way or another is affected about issues bothering on the welfare of the elderly and the aging population of the society. Interestingly, on a globally scale, a new demographic milestone is being reached. Since the start of recorded history, the number of young children have always been more than their elders. Likely in five years’ time, however, the number of persons at and above 65 years of age will be greater than the children under the age of 5. Due to declining fertility rates couple with an appreciable increase in life expectancy, aging population or the number of elderly persons in the society will continue to appreciate, even speed up. The number of persons who are of 65 years of age and beyond is expected to rise from an approximated figure of 524 million in the year 2010 to almost 1.5 billion in the year 2050, and much of this increase to be occurring in developing countries. This is based on the World Health Organization projection (WHO, 2011). See figure 1

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Figure 1. Projection of older adults and young children of the global population as a percentage: 1950-2050.


Nigeria undoubtedly is a foremost developing nations situated in sub-Saharan Africa.

Now, a fundamental issue critical to the welfare of persons within the aging population is the meeting of their nutritional requirements. Majority of older persons have to contend with different challenges daily in life and frequently in need of psychosocial with physical support and a constant medical attention. The United Nations (UN) agreed cut-off is 60 years and above, for those thought of to be old or elderly and this appears acceptable in the African setting such as Nigeria’s, as the retirement age for most of the civil servants in the country hovers around this age (WHO, 2018; Shofoyeke & Amosun, 2014; Aimasehun & Chapman, 2017). Furthermore, increasing life expectancy is changing the age demographic of populations across the world. In fact, the total number of older adults in Nigeria is approximately put at 6 million, (Nigeria, 2018; Demographics, 2018) with a steady growth being anticipated since she is a developing nation in her second stage of demographic transition with a lower death rate and high birth rate. Additionally, the life expectancy in Nigeria has also gone up from 37 years at independence (1960) to about 53.4 years in 2016, (Oluwaseun, Nyemike, & Taimola, 2019) with a growing number of older adults and their associated challenges. However, till the present times, the changes in life expectancy have not been mirrored by similar changes in healthy life expectancy, and in many countries, there have been increases in the number of healthy life years being lost to disability. The need to confront the issue of morbidity has turned attention to the aspect of lifestyle and health behaviours, with nutrition education, and their connections to the process of aging, with a focus to adopting strategies which encourages healthier aging (Eileen, 2015). This study will consider the meaning of aging and the importance of nutrition in health management during old age as well as potential opportunities and approaches to support older adults / retirees optimize their health with proper nutrition coupled with healthy lifestyle living. The following are the objectives of this paper:

I. What is aging and what are its hallmarks?
II. Scientific causes of aging versus some anti-aging nutrition / life-styles suppressors.
III. The effects of aging.
IV. Achieving healthy or good ageing through proper nutrition.

Ageing and Its Hallmarks
Aging could be explained as the gradual, continuous process of natural change which starts in early adulthood, leading up to early middle age, by which time much of the body’s functions begin to gradually decline. In humans, aging depicts the collection of changes in an individual over time, to include social, psychological and physical changes. The body’s reaction time or response to stimuli will slow as an individual becomes old. Correspondingly the individual’s knowledge of world and wisdom may expand. Aging is one of the known most predisposing factors for the majority of the diseases which afflict humans: of the approximately 150,000 persons who die every day globally, about two thirds die from age-related causes (Ahmed et al., 2017).
Practically any system, tissue or organ can cease to function due to aging. The heart, a crucial organ with little room for error is the organ that frequently fails. With regards to persons beyond the age of 85, heart diseases are the fundamental causes of death, accountable for approximately 40 percent of all deaths, followed by cancer, cerebrovascular diseases, neurodegenerative disease like Alzheimer’s and Parkinson’s diseases, infectious diseases and diabetes (US Department, 2013). Because aging increases the morbidity of many diseases, one defining feature of aging is an increased probability of death with age. In fact, one definition puts aging as: the assembly of changes which renders humans progressively more possibly to die (WHO, 2021). Human mortality rates increases exponentially after about age 30. Specifically, the likelihood of dying for a given individual beyond 30 years of age doubles approximately every 8 years (Hui, Claire, & Kenneth, 2017). The exponential growth in mortality with age – hallmark of ageing; is also noted in many other species and in animal models of biomedical research. The rate at which mortality grows with age within specified population can also be used to roughly approximate the rate of aging. Thus, human aging encompasses physiological changes that typically result in a functional decline with age, which in turn results in a loss of equilibrium between different physiological systems and their ability to respond to environmental challenges, also known as homeostasis. As organs functions are progressively impaired, this results in a higher rate of susceptibility to most diseases which eventually gives rise to the exponential increase in mortality. Aging can also be defined as a progressive deterioration of physiological functions, which goes along with an increase in vulnerability and mortality with age (Claudio, et., 2018).

Scientific causes of aging versus some anti-aging nutrition / life-styles suppressors

I. Free radicals: Just the way rust attack a car, also free radicals – chemically unstable molecules – commence assault on our cells and harm our DNA, a procedure many experts believe speeds up the aging process. Furthermore, it is also known that free radicals increases an individual’s chances of getting cancer. It is simply impossible to entirely keep away from these molecules – as they are ever found in the air we breathe – but we can minimize our exposure to them by keeping away from things such as: trans fats (partially hydrogenated oils which are present banned from many foods), cigarettes, charred meats, excess sun exposure and some other sources. Nutritionists recommends the purchasing of organic fruits and vegetables whenever possible to limit one’s exposure to pesticides and herbicides, which also contain the harmful molecules (Deborah, 2021). If a person is having difficulty going completely organic, the individual should try at least to afford these organic foods such as: apples, peaches, blueberries, celery, nectarines, strawberries, bell peppers, cherries, imported grapes, kale, spinach, and potatoes. The Environmental Working Group discovered that the “dirty dozen” contain the most significant degree of chemical residue in contrast to other varieties of produce. Granted, vegetables and fruits are very much loaded with antioxidants, which is believed to counteract free radicals, so an elderly person should endeavour to get at least five servings per day, organic or not. Those having the most amount of antioxidants are: prunes, raisins, blueberries, and kale (Lauren, 2012).

II. Inflammation: Basically part of a healthy immune response to foreign invaders, inflammation is now regarded to be a major player in a lot of the diseases of aging including heart disease, cancer, diabetes, and Alzheimer’s that is, when it turns chronic. This takes place when the immune system starts targeting healthy cells and tissues for attack. In the keeping of inflammation at bay, one means is to imbibe a Mediterranean-style diet, based on whole grains, fatty fish like tuna and salmon, vegetables, fruits, and monounsaturated fats (nuts, avocados & olives) with little meat (Irene, et al., 2018). Studies show that: the heart patients who follow this diet have much lower rates of heart attacks, even if they have high cholesterol. Other beneficial anti-inflammatory foods include: chocolate (the really dark kind that has 70 percent or higher cacao content), spices like turmeric and red wine, which has the anti-aging chemical resveratrol. However, resveratrol may be of more use as a supplement, since a person would need to drink over 100 bottles of wine per day to make any real meaning on the ageing process, researchers posited (Amanda, 2019).

111. Glycation: This word means excess sugar, or it also could refer to the outcome when the sugar combines with fats and proteins forming molecules which encourages aging. Advanced Glycation End-products, or AGEs, speed-up the process of aging by stirring out free radicals and facilitating
inflammation. One way to avoid taking in AGEs? Bring down the heat during cooking. The browning effect which happens when one stir-fry vegetables using much heat or blacken chicken in a frying pan makes these molecules to be produced, especially if one is adding sugar to mix. Checking the intake of foods filled with sugar generally will also help, as excess sugar usually combines with proteins in the body to form AGEs (Deborah, 2010). At present, the recommendation of the American Heart Association is that the female folk should consume not more than 100 calories a day of added sugars, why men should consume not more than 150 calories a day. Aside from increasing the chances of heart disease, AGEs appear to play a role in diabetes by causing blood to become sticky and hampering its capability to flow smoothly through capillaries into the extremities and vital organs like the kidneys and eyes (Julie, 2014).

**Effects of Ageing on the body systems**

Table 1. Examples of how aging affects some of our major body systems.

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<th>S/N</th>
<th>THE BODY SYSTEMS</th>
<th>EFFECTS DUE TO AGING</th>
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| 1   | Cells, Organs and Tissue | • Cells becomes barely able to divide.  
• The telomeres-the ends of the chromosomes inside every cell-gradually get shorter till, eventually, they get too short that the cell dies.  
• Waste products accumulates.  
• Connective tissues linking the cells becomes inelastic.  
• The highest functional capacity of many organs become lessen. |
| 2   | Blood Vessels and Heart | • The heart’s wall becomes thicker  
• Heart muscle becomes less efficient (working harder to pump the same amount of blood)  
• The aorta (the body’s main artery) becomes thicker, inelastic, and slightly flexible.  
• Many of the body’s arteries, which include those that supply blood to the brain and heart, slowly develop atherosclerosis, although the condition never becomes severe in some people. |
| 3   | Vital Organs | • It is harder for the body to control its temperature.  
• Heart rate takes more time to return to normal after exercise. |
| 4   | Bones, Muscles and Joints | • Bones becomes thinner and less strong.  
• Joints become less flexible and stiffer.  
• The cartilage and bones becomes less strong and less bulky.  
• Muscle tissue gets slightly weaker and less bulky. |
| 5   | Digestive system | • Food movement in and out of this system gets slower.  
• The liver, pancreas, stomach and the small intestine produce smaller quantity of digestive juices. |
| 6   | Brain and Nervous system | • The number of nerve cells contained in the brain and spinal cord reduces.  
• The number of connections between nerve cells reduces.  
• Abnormal structures, also known as plaque and tangles, may be formed in the brain. |
| 7   | Ears and Eyes | • The retinas becomes thinner, the irises become stiffer.  
• The lenses gets less clear.  
• The wall of the ear canal becomes thinner.  
• The eardrums becomes thicker. |
| 8   | Skin, Nails and Hair | • Skin becomes thinner and gets less elastic.  
• Sweat glands produce less sweat.  
• Nail grow more slowly.  
• Hair get grey and some no longer grow. |

Source: (Richard, 2019) MDS manual online publication
Achieving healthy aging through proper nutrition

Healthy aging means defer of or cutback in the undesirable effects of aging. The targets of healthy aging are keeping up good physical and mental health, avoiding disorders, and remaining active and independent. It is a fact that aging involves physical changes. It does not have to mean discomfort and disability. A lot of the physical challenges relating to aging can be prevail over, drastically mitigated by eating right, exercising and taking good care of oneself. As a person ages, there is reduced metabolism, changes in smell and taste and slower digestion may affect the appetite, the food one can eat and how the body processes food. Eating a balance diet, which supplies all the necessary nutrients for health, is an important part of a healthy lifestyle (Better Health, 2021).

Aging can be related to a variety changes which occurs in the body, like thinner skin, muscle loss, and a reduction in stomach acid. A number of these changes can leave a person open to nutrient deficiencies, while others can affect an individual’s senses and quality of life. Studies have roughly approximated that some 20% of aged people are experiencing atrophic gastritis – a situation where by chronic inflammation has badly affected the cells that produce stomach acid. A low stomach acid production can adversely influence the absorption of certain nutrients, such as calcium, vitamin B12, magnesium and iron. Another challenge of aging is a lessen requirement for calories. Sadly, this presents a nutritional dilemma. Older persons need to consume enough of some nutrients, while eating less of calories. Happily, eating different kinds of foods can help a person meet his / her nutritional needs (Ryan, 2017). There is the challenge people may have to undergo as they become older in years, which is a decrease in their body’s capacity to identify with vital stimuli like thirst and hunger. This could cause them to become susceptible to dehydration and unintended weight loss. The older an individual gets, the worse off these outcome may be. Equally vital is for older persons to regularly consume different types of whole foods, like: vegetables, fruits, lean meats and fish. The mentioned healthy staples can assist the elderly combat nutrient deficiencies, without expounding the waistline. Nutrients which are very important as a person gets old include: vitamin D, protein, vitamin B12 and calcium (Jill, 2020).

1. Need for More Protein
It is common for an individual’s strength and muscles to diminish as a result of old age. Studies have it that: on average an adult loses 3-8% of his or her muscle mass each decade after age 30. This fall in muscle strength and mass is what is called sarcopenia. Sarcopenia is a leading factor of weakness, poor health and fractures among the elderly. The consuming of more protein can assist the body to maintain muscle mass and fight sarcopenia. A study on 2066 aged persons for about three years led to this conclusion that: those who consume the most protein on a daily basis lost 40% of their muscle mass than people who consume the least. Also, a consideration of 20 contemporary involving elderly persons revealed that the consuming of more protein-rich foods or protein supplements may reduce the rate of muscle loss, grow muscle mass and assist in the formation of more muscles. Furthermore the combination of resistance exercise with a protein-rich diet appears to be the best way to combat sarcopenia (Kyle, et al., 2012)

2. Need for More Fibre
Constipation among the elderly is a frequent health challenge. It is mostly seen in people above 65 years of age, and it is much prevalent with the female folk. The reason being that people within this age seems to move less, and more likely to be under some medications that cater to their constipation as a side effect. Eating fibre may aid in relieving constipation. In an investigation involving five studies, scientists discovered that dietary fibre helps invigorate bowel movements in persons having constipation. Additionally, a high-fibre meal may help to avoid diverticular disease – a condition where by little pouches form within the colon wall making it to become inflamed or infected. This condition is usually common among the aged. Diverticular disease is seldom seen as a disease of the western diet. Conversely, diverticular disease is nearly non-existent in populations with higher fibre intakes. For instance, in Japan and Africa, diverticular disease affects less than 0.2% of the people there (Leslie, 2017).

3. Need for More Vitamin D and Calcium
Vitamin D and Calcium are two of the most important nutrients for bone health. Calcium assist in the building and maintenance of healthy bones, whereas vitamin D assist the body to take in calcium. Sadly, older adults tend to absorb only but a little calcium from their diets (Ryan, 2017). Studies
involve humans and animals have shown that the gut tend to absorb less calcium with age. However, the decrease in calcium absorption is perhaps as a result of vitamin D deficiency in the body, since aging can make the body less efficient at manufacturing it. The body can produce vitamin D from the cholesterol on the skin when it is exposed to sunlight. However, ageing can cause the skin to become thinner. This reduces its ability to manufacture vitamin D. Jointly the mentioned changes could make one unable to obtain sufficient calcium plus vitamin D, encouraging the risk of fractures and increasing bone mass loss and increasing. To counter aging effects on one’s calcium and vitamin D levels, it is necessary that one consume more vitamin D and calcium through foods and supplements. A number of foods contain calcium, including dairy products and dark green, leafy vegetables. There are other good sources of calcium. Meanwhile, vitamin D can be found in some variety of fish, such as herring and salmon. Older adults can do themselves much good by taking a vitamin D supplement like cod liver oil (Ryan, 2017).

4. Need for More Vitamin B12
Vitamin B12 – a water soluble vitamin also called cobalamin. It is essential for producing red blood cells and maintaining healthy brain function. Low level of vitamin B12 has been linked with memory loss and associated with age related hearing loss in older adults. Sadly, studies estimate that 10-30% of persons above 50 years of age have a decreased the body’s ability to take in vitamin B12 from their foods. Gradually, this could result in a deficiency in vitamin B12. Vitamin B12 present in the diet is attached to proteins in the food we consume. Before the body can utilize it, stomach acid will assist it to move apart from the food proteins. Older people are usually prone to having this issue of decreased stomach acid production, resulting in less vitamin B12 assimilation from foods. Atrophic gastritis is a condition that can cause this. Additionally, older adults who maintain a vegan or vegetarian life-style are not likely to eat rich sources of vitamin B12, due to the fact that it is plentiful in animal diets like meat, eggs, dairy and fish. Consequently, older persons can benefit from having vitamin B12 supplement or eating foods rich in vitamin B12. These rich foods contain crystalline vitamin B12, which is not combined to food proteins. So people who make less than the usual quantity of stomach acid can still absorb it (Adam, 2017).

5. Water
Water is often the forgotten nutrient. But getting enough fluid is needed for all bodily functions.
I. Healthy adults need about 1.5 to 2 litres or 48 to 64 ounces of fluid per day.
II. The natural feeling of thirst decline as we age, which leaves us exposed to the dangers of dehydration.
III. Place attention on fluids that are not diuretics, like fruit juices, decaffeinated beverages, non-fat or low-fat milk and, of course water (Kris, 2020).

6. Other Nutrients that may help as one ages are
I. Potassium: A high potassium consumption is linked with a low risk of kidney stones, high blood pressure, heart disease and osteoporosis. All of which are more common with the elderly.

II. Omega-3 fatty acid: Heart disease is the main cause of death among the aged adults. Studies have it that omega-3 fatty acid can lower heart disease risk factors like triglycerides and high blood pressure.

III. Magnesium: magnesium is a vital mineral of the body. Sadly, elderly persons are prone to having less magnesium in their systems due to poor intake, use of medications and age-related changes in the gut function.

IV. Iron: Iron deficiency is prevalent with the elderly people. This may cause anaemia – a condition in whereby the blood does not provide sufficient oxygen to the body. To improve absorption of iron, vitamin C rich fruits, vegetables should be included in the diet. Much of these nutrients can be gotten from a diet rich in vegetables, fruits, fish and lean meats. However, persons who consume a vegetarian diet stand to benefit from having omega-3 or iron supplement. In spite of the fact that iron can be found in various vegetables, plant sources of iron are not assimilated as much as meat sources of iron. Omega-3 fats are majorly seen in fish.

V. Vitamin E: Research has shown that eating food rich in vitamin E, such as whole grains, peanuts vegetable oils, and seeds may help
lessen the risk of Alzheimer’s disease (Ryan, 2017).

VI. Load-up on anti-oxidants
The supreme anti-aging tool is anti-oxidants. The pigments which gives food and vegetable their colour are strong antioxidants. Deep green vegetables like mustard, spinach and fenugreek are loaded with chlorophyll and polyphenols. Flavonoids and Carotenoids found in most vegetables and fruits help build cell membranes and protect collagen. So think of colour. Go for bright red tomatoes, carrots, purple cabbage, beetroots, yellow oranges, red capsicum, sweet potatoes and broccoli (Shilpa, 2018).

7. Buy seasonal foods
To optimize the amount of phytonutrient in foods, it is wise to purchase seasonal vegetables and fruits. Decide on organic produce. Reduce pealing for some phytonutrients are more abundant in the skin. It is advisable to steam or lightly cook to protect water soluble nutrients. As gain; the more anti-oxidants an individual has in his or her blood stream, the more fortified that individual is from diseases such as diabetes and cancer (Shilpa, 2018).

Conclusion and Recommendations
As has been discussed thus far, aging is a continuing deterioration of physiological function, occurring with increased vulnerability, morbidity and mortality amongst the elderly individuals of the society – the class of which those who have retired from the cooperate service due to advanced age fall into. Aging is a natural process which comes with a lot of undesirable effects. However, in the modern management of the process – aging, there is the: regular consumption of balanced diets, healthy nutrition, food supplements and living of a healthy lifestyle. Having successfully highlighted what aging really is and the ways it can be effectively managed through proper nutritional education for the betterment of the society; the following are hereby recommended:
1. Members of the ‘old people’s’ population which include, the retirees, the aged in the society should make a conscious effort to be educated in the nutritional management of their health as this will aid them in always making the right choices as regards the right nutrition suitable for their population.
2. The elderly in the society should be consuming more of healthy foods, balanced diets, foods low in calories but high in nutrient content such as proteins, fibres, vitamin D, and calcium. They should also do well to live out a good lifestyle devoid of harmful habits such as smoking of tobacco, in order for them to be able to achieve healthy aging.
3. Beside nutrition, regular bodily exercises, couple with living of a good lifestyle (i.e. a life free from of injurious habits) by the aged, retired and the elderly is equally vital in the management of their old-age related morbidities
4. Care givers to the aged and elderly must ensure that their nutrition is prepared according to their needs and not according to their wants as some elderly ones would rather prefer to satisfy their dietary wants instead of needs.

References

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