Review on Nutrition Based Healthy Elderly

Vithushana. T, Jeyaweera. B

Faculty of Livestock, Fisheries and Nutrition, Wayamba University of Sri Lanka, Sri Lanka

ABSTRACT

People whose age are over 60 are defined as elderly population. The elderly population is increasing at a constant rate and women comprise the majority. The sex ratio of male to female is 0.74. It is predicted that, in the year 2037, the over-60 population will be 20% (1 in 5 people) and by 2050 it will be 29% (nearly 1/3rd of the population). Regular health screening programs are lacking in the elderly population in community settings, although different types of healthcare programs are available all over the world. Public health professionals such as public health midwives focus on particularly maternal and child care in the community than the elderly population. The most common health issues of the elderly include falls, malnutrition, neurodegenerative conditions, cognitive impairment, osteoporosis and non-communicable diseases such as diabetes, cancer and Cardiovascular Diseases (CVDs) is rising due to ageing.

KEYWORDS: Elderly, Community, Health, Population

INTRODUCTION

According to the World Health Organization, people whose age is over 60 years are defined as older or elderly people. However, most developed world countries have accepted the age of 65 years as a definition of an older person or “elderly” (WHO, 2019). Zizza et al., (2009) states that age 65 to 74 as young-old, age 75 to 84 as middle-old, and age 85 or over 85 as oldest-old.

The prevalence of the elderly population in the world has increased gradually over the past few decades. The elderly population is estimated to be more than doubled, from 841 million people in 2013 to about 2 billion in 2050. Approximately, two-thirds of the world’s elders live in developing countries (De Silva et al., 2017). Sri Lanka has shown an increasing life expectancy at birth, decreasing mortality rates within the past few decades (De Silva et al., 2017) and has the fastest growing elderly population in South East Asia (Rajapakse et al., 2012). Women comprise the majority (56%) of the population. In 2012, the proportion of the population aged 60 years and older was nearly 12.2%, which is estimated that this proportion would rise up to 16.7% by the year 2021 and by 2041, 1 out of every 4 people in the country will be an elderly person (De Silva et al., 2017). Nearly, 80% of elderly people live with their children, and many depend on their children for financial and other support. Only 6% of the elderly live alone (Vodopivec, 2008). During the last two decades, the number of institutionalized elderly people has increased noticeably in Sri Lanka (Siddisena 2005, cited in Rathnayake et al., 2015).

AGEING PROCESS

There are some theories of ageing which explain the mechanisms behind loss of physical resilience, decreased resistance to disease and other physical and mental changes. Theories of ageing can be described from two perspectives including programmed ageing theories and “wear-and-tear” theories. Caloric restriction is an intervention which combines the properties of several ageing theories to manipulate life span and morbidity. Programmed Aging includes “Hayflick’s Theory of Limited Cell Replication” and “Molecular clock theory”. Wear-and-tear theories include “Free-Radical or Oxidative Stress Theory” and “Rate-of-Living Theory” are based on the concept that mistakes in the replication of cells or buildup of damaging by-products from biological processes eventually destroy the organism (Brown et al., 2011).

PHYSIOLOGICAL CHANGES

Ageing is associated with body composition changes which lead to loss of physical resilience. Some of these age-associated physiological changes are due to genetic factors or other lifestyle-related factors such as poor diets and inactivity (Brown et al., 2011).

1. Body lean mass and fat mass

Among all age-related physiologic changes, the biggest effect on nutritional status is the shifts in the musculoskeletal system, which loses up to 15% of the fat-free mass (FFM) also known as lean mass. Lean mass is important to the mobilization of metabolic substrates and essential molecular synthesis. Major musculoskeletal System changes due to
ageing include reduced lean body mass (bone mass, skeletal and smooth muscles and water), increased fat mass, decreased resting metabolic rate and reduced strength (Brown et al., 2011). Shrinking of muscle cells, loss of cells due to muscle ageing and loss of elasticity (due to accumulation of fat and collagen proteins) causes the decrease in lean mass (Keller and Engelhardt, 2013). Loss of muscle mass causes accumulation of fat in the body and the reduction of muscle strength, basal metabolic rate and energy needs. Loss of muscle mass link with premature mortality, disability, physical frailty, and other age-related health complications. Damayanthi et al., (2018) states that Aging is associated with loss of muscle mass which results in decreased muscle strength. Loss of skeletal muscle mass, or sarcopenia, is related to decreased mobility, increased risk of morbidity, and reduced quality of life in elderly (Kim et al, 2016). If the skeletal muscle is depleted, there is a low amount of protein to fuel the functionality of the body, which improves the risk of disabilities and functional impairment while reducing muscle power and physical function (Ribeiro and Kehayias, 2014). The decline of muscle mass and muscle strength leads to difficulties in performing daily activities and increased risk of falling (Janssen et al, 2002). The balance between protein synthesis and degradation is important for maintaining the composition of lean mass (Damayanthi et al, 2018).

Normally, there is a decline in lean body mass of 2% to 3% per decade from age 30 to 70, including loss of muscle (sarcopenia) beginning around age 40, although the weight is stable. Body fat increases, especially in the visceral region during this time. Males in their seventies have roughly 24 lbs. less muscle and 22 lbs. More fat compared to males in their twenties. After age 70, weight, including fat at all sites, begins to decrease. This causes lower levels of physical activity, food intake, and hormonal changes in women. Losses of fat-free mass in older people results in lower mineral, muscle, and water reserves (Brown et al., 2011).

4. Thirst, appetite, taste and smell
Age-related nervous System changes including reduced appetite and thirst regulation, reduced nerve conduction velocity, affecting the sense of smell, taste, touch, cognition and changed sleep as the wake cycle becomes shorter (Brown et al., 2011). Diseases, medications, and covering part of the palate with dentures also affect the taste. Hunger and satiety signals are weaker in the elderly than in adults. Elderly people may need to be more conscious of food intake levels because their appetite-regulating mechanism may be blunted or they are unable to adjust to cycles of more and less food intake, which may lead to overweight or anorexia. The thirst-regulating mechanism of elders was less effective than that of younger individuals. Dehydration occurs more quickly after fluid deprivation and that rehydration are less effective in older men (Brown et al., 2011).

5. Visual and Hearing
Vision and hearing loss has a prominent impact on the quality of life in the elderly. Unlike the prevalence of hearing loss, the prevalence of visual impairment has decreased in spite of an increasingly larger population of elderly worldwide (Rooth, 2017).

6. Other changes
Self-perception of good health declines with age, but having a chronic health problem does not prevent some of the elders from having a healthy perception.

NUTRITIONAL PROBLEMS AND COMMON DISEASES IN ELDERLY
Nutritional status is a key determinant of the quality of life, morbidity and mortality of older people. Evidence indicates that the elderly are at risk of nutritional deficiencies due to changes in body composition, the gastrointestinal tract, sensory function, fluid and electrolyte regulation, and from chronic illnesses (Brownie, 2006, cited in Rathnayake et al., 2015). The nutritional risk factors identified in elderly includes hunger, poverty, inadequate food and nutrient intake, functional disability, social isolation, living alone or reduced social contact, widowhood, depression, dementia, dependency, poor dentition and oral health, chewing and swallowing problems, polypharmacy (use of multiple medications) and presence of diet-related acute or chronic diseases or conditions. Most of the elders who have difficulties in walking, shopping, and buying and cooking food are at risk for malnutrition (Brownie, 2006, cited in Rathnayake et al., 2015; Brown et al., 2011).

1. Sarcopenia
Sarcopenia is a geriatric syndrome, defined as the age-related loss of muscle mass and declined muscle function which is associated with poor quality of life, falls, disability and mortality in the elderly (Wu et al., 2016). Sarcopenia can limit the physical activity as well as limitations in functional status of the elderly (Doherty, 2003, cited in Mohamad et al., 2010). According to Roubenoff 2003, cited in Mohamad et al, (2010), muscle quantity decreases with increasing age and this will also cause a decrease in the functional status of the elderly. This decreased functional ability will affect the mobility and quality of life of the elderly (Mohamad et al., 2010). Kim et al., (2016) states that sarcopenia, is associated with impaired mobility, increased risk of morbidity, and reduced quality of life in elders.
Sarcopenia is prevalent among the ageing population and chronic disease patients. Therefore, the loss of muscle mass and strength affect functionality through factors such as age, sedentary lifestyle and suboptimal diet (Shahrook et al., 2017).

2. Osteoporosis
Osteoporosis means “porous bone.” Reduced bone mass and disruption of bone architecture can result from an imbalance of available nutrients. Bone mass loss is greater for women, who can lose up to 20% in the 5 to 7 years past menopause. After age 65, rates of loss are typically less than 1% per year. Men develop osteoporosis later than women because they have larger frames, and their testosterone levels fall more slowly, typically over a period between ages 40 to 70 (Brown et al., 2011). Many studies have explained the relationship between osteoporosis and sarcopenia, because sarcopenia and osteoporosis have many common causal factors, including decreased age-related sex hormones, decreased anabolic hormones and vitamin D deficiency. The presence of osteoporosis increases a patient’s risk of developing sarcopenia (Tanimoto et al., 2014).

3. Falls and Fractures
Fractures and falls cause injuries which make it impossible for some older adults to remain independent. The risk is greater for people over age 80 compared to those aged 65 and older. Moreover, 50% of older individuals who fracture a hip have permanent functional disabilities. Some of these complications include impaired mobility and complicating all the activities of daily living (including eating and exercising). If an elderly person has also had a stroke, impaired mobility becomes the leading cause of institutionalization in the United States (Brown et al., 2011).

4. Malnutrition
Elderly malnutrition is defined as overweight or underweight, deficiency of more than one nutrient or suffering from one or more chronic diseases (Cowan, 2004, cited in Kady and Tayel, 2018). Inadequate or excess intake of some nutrients causes malnutrition which can be a contributing factor to chronic diseases (Mohamad et al., 2010). There is a higher prevalence of malnutrition in the institutionalized elderly compared with the free-living elderly, worldwide (Rathnayake et al., 2015). Poor appetite is much related to undernutrition and commonly occurs among older people (Mohamad et al., 2010). The decline in appetite is commonly observed in the elderly which has been described as ‘anorexia of ageing’ (Chapman, 2007; Morley, 2001; Hays and Robert, 2006, cited in Mohamad et al., 2010). Anorexia of ageing is a constant decline in appetite in the elderly until a severe reduction in body weight occurs. It is the consequence of protein-energy malnutrition which is commonly experienced by the elderly (Chapman, 2007; Wilson et al., 2005, cited in Mohamad et al., 2010). Underweight is much critical than overweight for elders. The consequences of malnutrition include increased incidence of diseases, affect the immune response, muscle and respiratory function, and wound healing. Malnutrition is associated with ageing. Poverty, illnesses, polypharmacy, living alone are common causes of under-nutrition which can be identified by body mass index or Mini nutritional assessment tool (Brown et al., 2011). Geriatric population in Sri Lanka is a potentially vulnerable group for malnutrition (De Silva et al., 2017). Rathnayake et al. (2015) states that about 30% of institutionalized elders in Sri Lanka were undernourished.

5. Overweight and obesity
For elders, extra weight during illnesses, especially hospitalizations, seems to be protective (Brown et al., 2011). However, overweight and obesity are risk factors for chronic diseases such as diabetes, cardiovascular diseases and cancers. A study on the prevalence of adult obesity in Sri Lanka has shown that a markedly high proportion of elders were overweight or obese. Overweight or obesity in elderly women (60.0%) was higher than that of elderly men (43.8%) which indicates that the elderly women are a high risk to experience poor health status (De Silva et al., 2017).

6. Diabetes
Diabetes is one of the most common chronic diseases in the elderly. Individuals with diabetes are at greater risk for heart disease and its complications, risk of amputations, macular degeneration, visual loss, cataracts, glaucoma, and neuropathies (nerve damage, pain, or tingling) of the hands and feet (Brown et al., 2011).

7. Cardiovascular diseases
Cardiovascular System changes related to ageing include reduced blood vessel elasticity, blood volume, stroke volume output, increased arterial stiffening and blood pressure. Heart disease (cardiovascular disease or CVD) is the leading cause of death in elders and can be reversible by following a healthy lifestyle (Brown et al., 2011).

8. Hypertension
Higher blood pressure puts more force on vessel blockages and increases the chances of blood vessel breakage. An individual who maintains the blood pressure with medication is still considered to have hypertension (Brown et al., 2011).

9. Gastrointestinal System
Gastrointestinal System changes with ageing including reduced secretion of saliva and of mucus, missing or poorly fitting teeth, dysphagia or difficulty in swallowing, less-efficient mitochondria produce less ATP, reduced secretion of hydrochloric acid and digestive enzymes, slower peristalsis, reduced vitamin B12 absorption, Gastroesophageal Reflux Disease (GERD), Vitamin B12 mal-absorption and constipation (Brown et al., 2011).

10. Alzheimer’s disease and Dementia
Losing the ability to function independently and becoming dependent on others is a common aspect in getting old. Memory impairment is a step in the loss of independence. More serious losses of memory and cognitive function are grouped under the term “Dementia”. These patients require more assistance with meal preparation and eating. In later stages of the Alzheimer’s disease, wandering and restless movements expend energy and increase caloric need. Behavioural, physical, or neurologic problems may obstruct adequate food intake which leads to unintentional weight loss (Brown et al., 2011).

ENERGY AND NUTRIENT REQUIREMENTS IN ELDERLY

Energy
Elders consume fewer calories as they age (Brown et al., 2011). Energy expenditure mainly determined from basal...
metabolic rate (which slows with age), diet-induced thermogenesis, and physical-activity energy needs. Genetics, hormones, and body composition also affect metabolic rates, resulting in broad ranges of energy needs for older populations which reflects the heterogeneity of older populations and the need for individualized nutrition planning (Brown et al., 2011).

**Protein**

Elders who are living alone, living in poverty, or have functional limitations are vulnerable to inadequate protein intake which contributes to muscle wasting (sarcopenia), weak bones, a weakened immune status, and delayed wound healing (Brown et al., 2011). Elders who consume a low-calorie diet leads to a proportionately greater need for protein. Decreasing muscle mass does not lead to lower protein requirements but someone who is losing muscle due to inactivity requires higher protein intake. Consuming adequate protein amount which is slightly above the RDA, and spread throughout the day, stimulates muscle synthesis and minimizes the risk of sarcopenia in ageing adults (Brown et al., 2011). Adequate protein intake is important for muscle protein synthesis and the preservation or improvement of muscle mass and strength. Evidence suggests that total protein intake and the pattern of protein intake affects the balance between protein synthesis and breakdown (Mishra et al., 2018). Bauer et al., 2018, cited in Mishra et al., (2018) states that sufficient protein intake is important for muscle protein synthesis and preservation or improvement of muscle mass and strength. Based on the age-associated decline in protein utilization for muscle protein synthesis, Bauer et al., 2018 suggested a protein intake for the elderly of 1.0–1.2 g protein per kilogram body weight per day (g/kg/day), an amount which is well above the current recommendations of 0.8 g/kg/day for all adults. Furthermore the amount of protein intake, the protein intake distribution might be associated with muscle mass and strength.

Although WHO’s RDA of protein intake is 0.83 g/kg Body weight for the adult population, higher intake has been suggested beneficial for the prevention of sarcopenia (Shahbrook et al., 2017). Rachel et al., 2015, cited in Ten haaf et al., (2018) states that the RDA (0.8g/kg Body Weight) may be inadequate to promote optimal health in elderly. Current studies suggest that elderly people should take about 1g to 1.3g of protein per kg of body weight per day for optimal physical function (Nowson and O’Connell, 2015). In addition to total daily protein intake, the timing of protein intake also important to promote muscle protein synthesis, maintain muscle mass and function in the elderly. Ten haaf et al., (2018) states that increasing total protein intake and extending protein intake distribution are potential strategies to reduce sarcopenia related loss of physical function and quality of life. Although many research studies identified that higher protein intake may prevent and treat sarcopenia, there is no agreed recommended daily protein allowance for elders. Many long-term observational studies which studied the association of dietary protein intake with body composition and functional outcomes have indicated that protein intake is positively associated with preservation of lean mass in elderly (Beasley et al, 2010).

**Carbohydrate and fiber**

11. Carbohydrate intake 45% to 65% of calories, added sugars less than 25% of calories are recommended for the elderly population. Depending on caloric intake, 21 and 30 grams of dietary fiber daily for females and males are recommended (Brown et al., 2011).

**Fat**

The high intake of saturated fat and trans-fatty acid intake is a risk factor for chronic disease. Minimizing the total fat intake between 20 and 35% of calories, saturated fat less than 10% and cholesterol 300mg or less is recommended for older adults (Brown et al., 2011).

**Fluids**

The proportion of water in total body weight decreases with age and dehydration increases the resting heart rate and susceptibility to the development of urinary tract infection, pneumonia, pressure ulcers, confusion, disorientation, and dementia. The recommended fluid intake is 2L or 8 cups (Brown et al., 2011).

**Vitamins and minerals**

12. Food intake and energy intake decrease with ageing, but the requirement for most minerals and vitamins do not decrease (Tur et al, 2003). Some of them use medications and laxatives which interfere with vitamin D metabolism. Due to limited sunlight, institutionalization or being homebound, the photochemical production ability of vitamin D declines. Vitamin D influences muscle metabolism and tropism and its deficiency is related to sarcopenia (Calvani et al., 2013, cited in Liguori et al., 2018).

Vitamin E plays a major role in the health of elders due to its antioxidant functions, such as hindering the development of cataracts, enhanced immune function and cognitive status. Vitamin B12 level in blood decrease with age. Folic-acid deficiency could mask vitamin B12 deficiency, which is more common in elders than folic-acid deficiency. Women’s iron needs decrease after menopause and iron is stored more readily in the old than in the young. Some elderly people have inadequate iron status due to blood loss from disease or medication, poor absorption due to antacid interference or decreased stomach acid secretion, and low caloric intake. Inadequate calcium intake may contribute to bone loss and calcium supplementation reduces the rate of bone loss in osteoporotic patients. However, taking large doses of vitamin and minerals cause involuntary weight loss or gain in the elderly (Brown et al., 2011).

**NUTRITIONAL ASSESSMENT OF THE ELDERLY**

1. **Anthropometric measurements**

   1. **Body mass index (BMI)**

      In the elderly population, BMI alone is not an adequate indicator of excess body fat associated with morbidity and mortality (Brown et al., 2011). However, it is difficult to accurately measure body fat mass. Therefore, BMI (kg/m2) has been widely used and accepted as a simple method to classify the medical risk of overweight status (Kady and Tayel, 2011)

2. **Waist: hip ratio**

   A study on elders has suggested that abdominal obesity is a better measure of premature death than BMI. Evaluation of obesity as a risk factor for stroke and transient ischemic attacks found that markers of waist circumference, waist-to-stature ratios, and waist-to-hip ratio predicted stroke cases better than BMI (Gultekin et al., 2013).
3. Mid-upper arm circumference
A study on the prevalence of undernutrition in institutionalized elderly living in Sri Lanka has observed that according to the WHO cut-offs, 23% of the institutionalized elderly had a lower MUAC than recommended which suggests declining muscle mass and fat stores (Rathnayake et al., 2015).

4. Calf circumference
Calf circumference is considered as the most sensitive measure of muscle mass in the elderly (Rolland 2003, cited in Rathnayake et al., 2015). According to the “Mini Nutritional Assessment tool” (Vellas 1999, cited in Rathnayake et al., 2015), the two categories of CC were, (i) <31 cm and (ii) ≥31 cm. Previous studies have recognized CC as a potential indicator of physical function, which provides useful information on muscle-related disability and physical function. High prevalence of low CC indicated weakness in leg strength and physical function in institutionalized elderly (Rathnayake et al., 2015).

5. Handgrip muscle strength
Handgrip muscle strength is often measured as a proxy for muscle strength which is a simple, noninvasive, reliable, and low-cost screening technique (Damayanthi et al., 2018). A study on “Handgrip Strength and Its Associated Factors” states that muscle wasting occurring with ageing is referred to as sarcopenia and HGS is used to assess sarcopenia (Damayanthi et al., 2018). Muscle strength is one of the key indicators of health status in older adults. Reduced muscle strength and power are closely linked with loss of independence, increased risk of mobility, disability, and mortality (4% increase with every 1 kg decrease in grip strength). A previous study has found that poor HGS was associated to increased mortality risk from cardiovascular disease and cancer, even after adjusting for body composition, multiple chronic diseases and multi-morbidity, in both men and women. A cross-sectional study done in Taiwan discovered that muscle mass had a stronger correlation with handgrip strength than walking speed (Wu et al., 2016).

HGS is frequently measured as a proxy for muscle strength (Reijnierse et al., 2017) and a good indicator of nutritional status as well as a risk differentiating method for all-cause death and cardiovascular disease including increased health recovery time after illness or surgery (Moy et al., 2011). HGS is commonly used as an indicator of muscle function and rapid, cost-effective method for nutritional assessment. Many researchers have indicated that HGS is significantly correlated with nutritional status. These previous studies indicated that people at nutritional risk have lower HGS. This may be due to poor nutrient intake result in reduced protein synthesis, which causes muscle fibre atrophy and decreased muscle mass and leading to impaired muscle function. Research on the association between dietary protein intake and grip strength has summarized that consuming equal or higher than 25g protein at 2 or more eating occasions was not associated with grip strength but higher daily protein intake was positively associated with grip strength in women (Mishra et al., 2018). A study conducted in Kandy district, Sri Lanka was observed that age, MUAC, diabetes mellitus, vegetarian diet, and alcohol consumption were the factors associated with HGS among community-dwelling elderly (Damayanthi et al., 2018).

2. Dietary assessment
2.1 24-hour dietary recalls
Protein intake was assessed using two 24-h dietary recalls which is a reliable, most common and validated method for determining the amount and distribution of protein intake (Ten haaf et al., 2018). A 24-h dietary recall comprises a logical approach to examine the nutrients that influence muscle strength and the underlying mechanisms because it takes actual food consumption. Recent studies suggest that HGS can be used as a predictor of nutritional status. Most of the sarcopenia and nutrition-related studies have investigated the effects on muscle strength of single macronutrients (e.g. protein) and micronutrients (e.g. vitamin B12, vitamin D, antioxidants). Therefore, to examine the role of nutrients in determining muscle strength thoroughly, a 24-h recall dietary questionnaire is effective to consider the overall diet which consists of complex mixtures of different foods.

2.2 Mini nutritional assessment (MNA)
Mini Nutritional Assessment is a valid, reliable and easy-to-use tool which can identify the risk of malnutrition. The MNA combines six screening questions in part 1 with 12 assessment questions in part 2 and does not require biochemical tests, for the assessment (Fernando and Wijesinghe, 2010). MNA can identify elderly people who are malnourished and at risk of malnutrition in short time (Kady and Tayel, 2018). MNA should be recommended as the basis for nutritional screening in older people due to its specific geriatric focus (Kady and Tayel, 2018). A study on the elderly in Galle district, Sri Lanka has revealed that nearly one-third of the study sample (N=396) were at risk of malnutrition which is identified by MNA (De Silva et al., 2017).

Living alone and Institutionalisation in elderly
According to the World Health Organization, the definition of quality of life is individuals’ perception of their position in life in the background of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (Kumar et al., 2016). Therefore, the quality of life depends on a person’s physical health, psychological condition, level of independence, social relationships and personal beliefs (Kumar et al., 2016). Some common problems in the elderly include lack of income to purchase food, lack of skills to select and prepare nourishing meals, limited mobility affects shopping and meal preparation and feelings of isolation and loneliness reduce the willing to eat (Brown et al., 2011). Those problems are more frequent among institutionalised elderly. Institutionalisation of elderly people occurs due to the lack of family care which affects the nutritional status of elderly people. Institutionalisation causes a series of modifications in terms of lifestyle and food habits changes that may induce changes in health status, nutritional status and body composition. Poor nutritional status is related to poor body composition which leads to poor functionality of the elderly (Mohamad et al., 2010).

Being with people has a positive effect on well-being, and eating (Brown et al., 2011). Elderly subjects who were living alone were more likely to have a poor appetite. Elders eat more when taking meals with their family members, relatives, or friends rather than eating alone (Mohamad et al., 2010). It is assumed that elders who are living alone have lower nutrient intake and lower health status than other
elderly groups. However, Kumar et al., (2016) states that there is a significant difference in the quality of life between elderly people from old age homes and free-living. Furthermore, institutionalized elderly have better physical health compared to the free-living elderly. In Sri Lanka, the quantity and quality of diets were below the national recommendations and the prevalence of undernutrition, as verified by BMI, in the institutionalized elderly was high (Rathnayake et al., 2015). Therefore, institutionalized elderly require specific attention and should be the main concern in public health nutrition intervention programmes (Rathnayake et al., 2015).

**Social relationships of elderly population**

Previous studies have identified that positive social relationship with family, friends, and neighbours promotes quality of life and decreased social relationships could associate with poor quality of life. Higher levels of social support have been linked to a reduced risk of mental disorders, diseases, mortality and improved quality of life. Studies conducted in developing countries have found that the quality of life of institutionalized elderly is poorer than community-dwelling elderly (Malveiro et al., 2017).

**Conclusion**

The physiological changes due to ageing cause a risk to their health if the nutritional status is poor. Therefore, adequate and balanced diet is important for maintaining proper nutritional status in the elderly. Most of the elders are relatively sedentary. Low activity levels, deteriorating strength, endurance, and sense of balance are associated with increasing age. Elderly people benefit from physical activities because they can maintain and build muscle mass and prevent muscle loss. Training exercises result in increases in lean mass, decreases in total, subcutaneous, and visceral fat mass and weight loss while resistance exercises increase lean muscle mass. Increased muscle mass rises caloric needs which improves the chances of optimal nutrient intake. Physical activities help to retain balance and flexibility, contributes to aerobic capacity, improves cognitive performance and psychological well-being. The combination of high protein intake and active lifestyle is related to a better quality of life in the elderly. Diverse diets have been shown to protect against chronic diseases such as cancers, as well as being associated with prolonged longevity and improved health status.

**References**


International Journal of Trend in Scientific Research and Development (IJTSRD) @ www.ijtsrd.com eISSN: 2456-6470


