Introduction

The United Nations estimates that there are 606 million people in the world over the age of 60, which represent roughly 10% of the population. This number is expected to be more than double to 1.6 billion by 2050, which is about 19% of the world's future population. Of this elderly population, already 62% live in developing countries, but by 2050, 80% of the world's elderly will be living in developing countries. Given the fragile nature of old age security arrangements in developing countries, many of these elderly face the risk of poverty in their old age ***(Schwarz, 2003).***

Regarding the number of geriatric homes in Egypt, an increasing trend for new homes can be observed **(Boggatz and Dassen ,** ***2005*****).**

Undernutrition is an important public health issue which is frequently undetected and untreated. Diseases are the major causes of undernutrition and older people are a particularly vulnerable group. Effective screening is needed to reduce the prevalence of malnutrition in older people and when this is established, action can then be taken to address the problem***(Todorovic, 2001).***

The world health organization (WHO) defines malnutrition as"the cellular imbalance between the supply of nutrients and energy and the body demand for them to ensure growth, maintenance, and specific function"***(WHO, 2003).***

Nutritional inadequacy in the elderly can be the result of one or more factors physiologic, pathologic, sociologic, and psychologic. A physiologic decline in food intake has been seen in people as they age regardless of chronic illness and diseases***(Morley, 2002).***

Studies using a variety of measurements and performed over the last five to ten years on different nursing home subgroups have shown that from 35 percent to 85 percent of United states nursing home residents are malnourished ***(Boyle, 1991).***

Malnutrition in older people is not only common, but frequently overlooked. It can result in multiple medical complications, hospitalization and even death***(Visvanathan et al., 2004).***

The consequences of malnutrition and dehydration for elderly nursing homes residents are potentially serious, and that when hospitalized for an acute illness, malnourished or dehydrated residents suffer increased morbidity, and

require longer lengths of stay. Compared with well-nourished hospitalized nursing home residents, they have a five fold increase in mortality in the hospital ***(Burger et al., 2000).***

Aim of the Work

To assess the nutritional status among female residents of elderly homes in Cairo.

Nutrition and Aging

Increased longevity in adults is now increasingly common in the developed and developing world. These demographic changes have resulted in increasing numbers and hence proportions of the adult population aged over 60. The time when older people will outnumber younger people is rapidly approaching, it is estimated that by the year 2025 the number of people worldwide aged 60 and over will exceed 1.2 billion ***(United Nations, 2013).***

Diet and lifestyle, coupled with maintenance of a healthy body weight are important in the maintenance of health for all age groups but are crucial for healthy aging. Maintaining a good nutritional status has significant implications for health and wellbeing, delaying and reducing the risk of developing disease, maintaining functional independence and thus promoting continued independent living ***(Prince et al., 2015).***

Health maintenance and aging without disabilities are goals for everybody. Aging is associated with progressive changes in body composition that have an important impact on health. After the age of 65 to 70 years, body fat content tends to decrease, even in healthy individuals, and

unexplained weight loss leading to protein-energy malnutrition becomes increasingly common ***(Moriguti et al., 2001).***

Changes in total body weight vary for men and women. Men often gain weight until about age of 55, and then begin to lose weight later in life. This may be related to a drop in the male sex hormone testosterone. Women usually gain weight until age of 65, and then begin to lose weight (**Bales and Ritchie, 2002).**

Although no clear agreement exists, the best accepted definition for clinically important weight loss is about 5% over 6 to 12 months. Therefore, all weight loss of 5% over 6 months should be investigated ***(Moriguti et al., 2001).***

In one study of mortality among men and women, the average age of the participants at enrollment was 57 years. it was found that a BMI of less than 22 kg per m^2 in women and less than 23.5 men is associated with increased mortality. In another study it was found that the optimal BMI in the elderly is 24 to 29 kg per m^2 ***(Huffman ,2002).***

Anorexia of aging and consequent weight loss are very common problems among the elderly, especially in nursing home residents and in hospitalized older patients. Anorexia is a true geriatric syndrome because it is a

multifactorial condition associated with multiple negative health outcomes ***(Donini et al., 2011).***

Hormonal Changes play an important role in the anorexia of aging. Increased levels and effectiveness of cholecystokinin combined with high serum level of peptide YY convey important anorexigenic signals to the hypothalamus. Leptin levels (decreasing food intake and increasing metabolic rate) increase with aging in males. The reduced glucose tolerance and elevated levels of insulin observed during aging may accelerate the development of anorexia ***(Chapman, 2007).***

Taste and smell diminish with age and poor dentition may limit food choice to soft foods. Dry mouth (xerostomia) is common, making swallowing difficult with subsequent avoidance of foods. Malabsorption of essential nutrient may occur as a result of gastrointestinal changes such as atrophic gastritis. Gastric emptying slows with aging with a potential detrimental effect on appetite. All of these factors, independently or collectively, can lead to a reduction in food intake ***(Watson et al., 2006).***

Chronic low-grade inflammation, a hallmark of the aging process, may modify the response of target brain areas to peripheral stimuli. Inflammatory cytokines,

including tumor necrosis factor-α (TNF-α), interleukin-1 β and interleukin-6 have been implicated in cachexia and weight loss. Cytokines may act both centrally, by inhibiting feeding behavior, and peripherally, by decreasing gastric motility, gastric emptying and intestinal motility and by modifying gastric secretion ***(Ruscin et al., 2005).***

It's suggested that the term wasting has tobe reserved for involuntary weight loss, generally driven by inadequate dietary intake. In contrast, the term cachexia to be used for involuntary loss of body cell mass or fat-free mass when this compartment is reduced with little or no weight loss. Such cachexia generally occurs in the setting of hypermetabolism and hypercatabolism. As regards sarcopenia, it's a term indicating specifically involuntary loss of muscle mass. Unlike wasting and cachexia, sarcopenia may be an intrinsic feature of aging, rather than an effect of an age-associated disease. Sarcopenia has been reported to be significantly associated with functional impairment and disability in elderly people***(Holloszy, 1995).*** sarcopenia is "a syndrome characterized by progressive and generalized decrease of skeletal muscle mass and strength with a risk of adverse outcomes such as physical disability, decrease quality of life and death" ***(Tanimoto et al., 2013).***When you are 80 years old,

it is estimated that 40% of the muscle mass at age 20 is lost ***(Boirie, 2009).*** Sarcopenia starts in the 4th decade of life and accelerates at the age of 75years ***(Waters et al, 2000)***.

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Many consequences of sarcopenia are prognostic indicators of public health burden, as the development of physical disability, nursing home admission, depression, hospitalization, and even increase mortality ***(Walston, 2012).***

Risk factors for malnutrition among elderly:

Aging is accompanied by an increased likelihood of suffering from one, or more, chronic diseases such as respiratory disease, arthritis, stroke, depression and dementia. These conditions may affect appetite, functional ability or ability to swallow, all leading to altered food intake and impairment of nutritional status ***(Heuberger and Caudell, 2011).***

Many medical conditions can cause weight loss. Congestive heart failure induces weight loss through its associated lack of gastrointestinal tract motility, hepatic congestion, increased work of breathing, fatigue and weakness due to poorly perfused muscle tissue, and mild protein-losing enteropathy. Chronic obstructive pulmonary

disease has been associated with increased resting metabolic rates due to the increased activity of the respiratory muscle. Parkinson's disease is associated with anorexia and increased energy expenditure. Malignant disease can produce weight loss through a variety of mechanisms ***(Wise and Craig, 1994).***

According to the Framingham Heart Study data, men and women with diabetes mellitus (DM) who are 50 years and older live an average 7.5 and 8.2 years less than individuals without diabetes. Nutritional factors play a significant role in modulating all the traditional risk factors for atherosclerotic disease. Appropriate dietary changes in the setting of DM are a critical task in the pursuit of healthy aging in this subgroup. DM in the elderly increases the risk of suboptimal nutrition, hospitalizations, nursing home admissions, and physical disability that substantially impairs quality of life ***(Russell et al., 2005).***

Weight loss in demented patients is the result of a complex process involving the early olfactory impairment that occurs in this disorder, as well as centrally mediated deficits in the control of appetite and satiety. Some patients with dementia can lose weight although they increase food intake. This fact could be partially justified by an increase in physical activity (agitation). As the disease progresses,

self-feeding skills are lost and dysphagia develops ***(Wise and Craig, 1994).***

Dysphagia is a common problem in older adults, most often due to neurological (Parkinson's disease, Alzheimer's disease, stroke) or esophageal disorders (motility problems, esophagitis, tumors) ***(Ship et al., 1996).***

Poverty, living alone and emotional isolation may result in inadequate food intake. Not only because they may lack motivation to prepare a meal that lonely they will eat, but also they may have to choose between spending money on food or on their medications. A frequent problem among the elderly is the emotional isolation due to loss of a partner or close friend. This emotional isolation is detrimental to health, and mortality has been well demonstrated. In addition, other elderly people, whether living alone or with a spouse or other relatives, may be at nutritional risk due to lack of knowledge about appropriate foods and food preparation ***(Markson, 1997).***

The risk of drug-induced anorexia is increased by polypharmacy due to the enhanced odds of drug–drug interactions and gastrointestinal problems***(Onder et al., 2014).***

The side effects of drugs are a major cause of weight loss in older people. Certain drugs cause weight loss by decreasing appetite (digoxin); by causing malabsorption (sorbitol in theophylline elixir); by increasing metabolism (excess thyroxin replacement); or by a combination of anorexia and increased metabolism (theophylline) ***(Wallace and Schwartz, 1997).***

Many individual medications have been associated with unintentional weight loss in elderly. These include some selective serotonin reuptake inhibitors (SSRIs), such as fluoxetine. Other SSRIs may have a lesser anorectic effect, but patients taking those drugs should still be followed closely. Sedatives and narcotic analgesics may interfere with cognition and the ability to eat. A reduction in the dosage of psychotropic medications may also cause weight loss, possibly by unmasking an underlying disorder such as anxiety or depression ***(Gazewood and Mehr, 1998).***

Reductions in energy requirements affect the quantities or volumes of food consumed, people tend to naturally eat less and this in addition to the physiological changes described, can lead to decrease in micronutrients intakes. A study of older adults living independently found shortfalls in intakes of vitamin C and calcium, vitamin D, folate, zinc and magnesium. Lowered intakes were

particularly evident in those aged 75 years and over ***(Power et al., 2014).***

Consequently, malnutrition is a frequent condition; both widely represented in geriatric population and underestimated in diagnostic and therapeutic work-up, and is known to affect health status and life expectancy of elderly people. The unexpected weight loss is a pathological condition, recently classified in three different ways (sarcopenia, wasting and cachexia) according to criteria of nutritional intake, functional abilities and age-related body composition modifications that are caused by social, psychological, and medical factors ***(Vetta et al., 1999).***

Malnutrition in elderly homes:

The number of geriatric homes in Egyptis increasing in an obvious manner **(Boggatz and Dassen ,*2005*).**

According to **Azer and Afifi (1992)**, 22 of the 49 homes that were present in Egypt at this time were in Cairo, 12 in Alexandria and 15 in other regions. This may be a bias of our development efforts in favour of the cities.

If geriatric homes are scarce in comparison with their probable need, this does not mean that older people want to stay in such a place. This depend on the target group's

response. **Azer and Afifi (1992)** claim that there were only 1741 residents for 2191 available places at this time. The Central Agency for Public Mobilization and Statistics (CAPMAS) in Cairo revealed that in 1999 from the 2388 places 2359 were occupied. Both numbers indicate a slight overcapacity.

Abd el Ghany (1986) found that felt loneliness was the resident's main reason for staying there, especially for males. Women, however, reported health reasons to a greater extent than men for their admission. If the main reason for admission is of a social nature, one could conclude that geriatric homes in Egypt have a different character. Not care dependency, but a need for contact with other people would be the main reason for staying there. The care dependency ensuing from an ageing population is a problem for two different social groups: the poorer ones, whose resources are too limited to provide adequate care and the middle class, whose life-style is undergoing a change.

However, there is nearly no information available about the quality of care in geriatric homes. Only one study by **Aly *et al.* (2002)** reported a prevalence of pressure ulcers of 31.8% among 223 residents of geriatric homes in

Alexandria, a figure which may be taken as a proxy indicator for quality of care.

Malnutrition in institutionalized elderly is of individual and public concern since it negatively affects health outcome and quality of life and is often preventable. Over the past years several studies have examined the prevalence of malnutrition in institutionalized elderly and reported greatly diverse results ***(Pauly et al., 2007).***

Various studies have demonstrated that the prevalence of malnutrition in nursing homes varies from 25% to 60%, depending on the definition applied, types of screening tools used and the characteristics of the patient population ***(Tominz et al., 2012).***

Studies on factors associated with malnutrition in the nursing home setting have found that factors associated with increased risks of malnutrition include: functional impairment, social isolation, wound or pressure ulcer, recently hospitalized, poor food intake, cardiovascular disease and stroke ***(Vandewoude and Van, 2013).***

Depression, swallowing or chewing problems, poor oral intake, and feeding dependence were associated with increased likelihood of weight loss and malnutrition among long term care residents ***(Tamura et al., 2013).***