INTRODUCTION

Nutrition is an important determinant of health in elderly patients. Over the past decade, the importance of nutritional status has been increasingly recognized in a variety of morbid conditions including cancer, heart disease, and dementia in persons over the age of 65 ***(Basran and Hogan, 2002; Tessier, 2002; Keller et al., 2003; Takashashi et al., 2003; Coombs et al., 2004; Van Wymelbeke et al., 2004).***

Malnutrition can be defined as: ‘a state of nutrition in which a deficiency, excess or imbalance of energy, protein, and other nutrients causes measurable adverse effects on tissue/body form (body shape, size, Composition) function and clinical outcome ***(Elia, 2003; Stratton et al., 2003b).***

Routine screening of Patients to identify risk of malnutrition has been recommended by many national, international and specialist organizations ***(British Dietetic Association, 1999; Elia, 2000 and 2003; British Association for Parenteral and Enteral Nutrition, 2001; Council of Europe, 2002; Royal College of Physicians, 2002; Kondrup et al., 2003, European Society of Parenteral and Enteral Nutrition, 2003).***

These recommendations have been made for several reasons. First, Malnutrition adversely affects physical and psychological function and impairs patients recovery from disease and injury, thereby increasing morbidity and mortality. Such

detrimental effects are costly to society and increasing health care utilization ***(Stratton and Elia, 2000; Stratton et al. 2002 &2003b).*** Second, despite being a common problem**,** malnutrition is frequently Unrecognized and untreated in many health care settings, including nursing and other care homes, general Practice, and hospital outpatients and inpatients ***(Consumer's Association, 1996 and 1999; Elia, 2000).***

The purpose of nutrition screening is to identify malnourished individuals or those at risk of becoming malnourished, so that more extensive and comprehensive nutritional assessment can be performed and intervention and plan of care is implemented ***(Green and Watson, 2006).*** The Mini Nutritional assessment (MNA) was developed to evaluate the risk of malnutrition in the elderly in general practice and upon admission to a nursing home or hospital ***(Yitshal, 2003).***

Implementing routine screening to detect malnutrition has been hindered by the lack of universally agreed criteria to identify it. Consequently, there are a variety of nutritional tools in use that incorporate different anthropometric, biochemical and clinical criteria which have often been developed for use in a particular setting or for a specific patient group ***(Stratton et al., 2003b).***

Although there is no uniformly accepted definition of malnutrition in the elderly, some common indicators include involuntary weight loss, abnormal body mass index (BMI),

specific vitamin deficiencies, and decreased dietary intake are used to detect malnutrition ***(Reuben et al., 2004)***. Malnutrition in older patients is regularly under diagnosed, and many physicians have expressed their need for more education regarding nutritional status in older patients ***(Gariballa, 2000; Mihalynuk et al., 2004)***.

The situation for hospitalized elderly is disturbing. Studies of hospitalized older patients suggest that between 20%–65% of these patients suffer from nutritional deficiencies ***(Elmstahl et al., 1997; Sullivan and Lipschultz, 1997; Hall et al., 2000),*** and the prevalence of malnutrition in long-term care facilities is estimated to be between 30%–60% ***(Rudman and Feller, 1989)***.

The sequale of malnutrition include physical, mental and social disability. If inadequate dietary intake continues for a long time (weeks or months) undernutrition results. If undernutrition is extreme, it results in diminished muscle mass and vigor, functional impairment and decreased Health Related Quality Of Life (HRQOL) ***(Muhlethaler et al., 1995; La Rue et al., 1997).***

HYPOTHESIS AND RESEARCH QUESTION

Hypothesis:

The intervention will improve health care providers' knowledge and anthropometric measurements.

Research Question:

Does short term improvement in health care providers' knowledge positively affect anthropometric measurements and quality of life in residing elderly in terms of physical and psychological aspects?

GOAL AND AIM OF THE WORK

Goal

To promote adequate nutritional status in the elderly

Aim of the work

To measure the frequency of different malnutrition risk factors in elderly at geriatric homes.

- To develop and implement a health education program for health care providers (HCPS) in geriatric homes about nutrition in Elderly.
- To evaluate the health education program in terms of:
  - HCP's knowledge and practice before and after the program regarding elderly nutrition.
  - Nutritional status of elderly served by HCP before and after the program in terms of anthropometric measurements and Unintended weight loss.
  - Physical and psychological aspect of Quality of life in term of activities of daily living and depression.

ELDERLY AND NUTRITIONAL REQUIREMENTS

1.1 Definition of Elderly

Most developed world countries have accepted the chronological age of 65 years as a definition of 'elderly' or older person, but this does not adapt well to the situation in Africa. While this definition is somewhat arbitrary, it is usually associated with the age at which one can begin to receive pension benefits. At the moment, there is no United Nations (UN) standard numerical criterion, but the UN agreed cutoff is 60+ years to refer to the older population ***(WHO, 2012).***

Although there are commonly used definitions of old age, there is no general agreement on the age at which a person becomes old. The common use of a calendar age to mark the threshold of old age assumes equivalence with biological age, yet at the same time, it is generally accepted that these two are not necessarily synonymous. Lacking an accepted and acceptable definition, in many instances the age at which a person became eligible for statutory and occupational retirement pensions has become the default definition. The ages of 60 and 65 years are often used, despite its arbitrary nature, for which the origins and surrounding debates can be followed ***(WHO, 2012).***

1.2 Epidemiology & Magnitude of the problem

In recent years, there has been a sharp increase in the number of older persons worldwide and more old people are alive nowadays than at any time in history ***(Hafez et al., 2000).*** The proportion of the population aged 60 and over, is also growing each year. By the year 2025, the world will host 1.2 billion people aged 60 and over and rising to 1.9 billion in 2050 ***(Mc Murdo, 2000; World Population Prospects, 2003).***

The world population is aging. With the aging of the world population, more than one quarter of the world population will be over the age of 60 by the year of 2010 ***(Lee et al., 2006).*** From 1965 to 2025, the percentage of people 65 years and older is expected to increase by 17 to 82% in European countries and by about 200% in some developing countries ***(Canbaz et al., 2003).***

The older population in the United States is rapidly growing and is expected to comprise almost 20% of the total population by the year 2030 ***(CDC, 2007; Sinnett et al., 2010).***

The same increasing trend is also predicted in the Eastern Mediterranean Region; while the proportion of the elderly population to total population was 5.8 % in 2000 it is expected to reach 8.7 % by year 2025 and 15.0 % by 2050 ***(WHO, 2003).***

In Egypt, the elderly people 60 years and over have increased 125% from 1986 to 1996 and they represent 6.2% of the population in 1996. In 2006, they reached 7.2% of the population.

Elderly are expected to reach 8.9% in 2016 ***(Abdallah and Ogbeide, 2002).***

The number of individuals aged 60 y or older is increasing rapidly worldwide. This transition from a young to old age structure will be more compressed in time for the less developed countries than it has been for the more developed countries. This rapid shift will have profound effects on their infrastructure, their economies, and their health care systems ***(Tucker and Buranapin, 2001).***

Few of these countries currently have programs aimed at older individuals. The systems of nursing homes, geriatric specialists, home care nurses, senior nutrition programs and senior centers that have developed to meet these needs in developed countries do not exist in most of the developing world ***(WHO, 2001).***

However, the implications of these demographic changes need urgent attention if the difficulties inherent in this transition are to be minimized. Nutritional status has a major impact on disease and disability and offers great promise for minimizing this oncoming burden. However, the current trend in developing countries is toward higher fat, more refined diets that contribute to increased risk of chronic disease, and the prevalence of chronic disease is already increasing rapidly ***(WHO,2001).***

At the same time, social and demographic changes are placing elderly at even greater risk of food insecurity and malnutrition. This double burden of under nutrition and obesity in an aging population poses tremendous challenges for developing countries, whose policies and institutions are currently unprepared to handle the demands these changes will bring ***(Murray and Lopez, 1997).***

Unfortunately, along with a dramatic change in age structure, there is evidence of a characteristic sequence of changes in dietary behavior and physical activity patterns that lead to increased risk of chronic disease. This has been called the "nutrition transition" and appears to be occurring rapidly and predictably in countries throughout the world ***(Popkin, 1994).***

1.3 Mechanism of Aging

The body starts to age from about the age of 20. Many people reach 'a ripe old age' are still alert and taking great enjoyment from life. The rate at which people age and become frail or disabled is influenced by their genetic make-up. However, many outside influences – such as involvement in the local community or special interest group, hobbies, the family or social circle – all play an important part in maintaining physical and mental resilience and enjoyment of life ***(Glass et al., 1999).***

As people get older, they are usually less active and therefore use up fewer calories ***(Reilley et al., 1993).*** Muscle fibres may get weaker as old people tend to lose muscle, and bone loss

accelerates ***(Widdowson, 1992).*** As they use up less energy, so they have less need and drive to eat calories. Energy expenditure decreases progressively with age, even if the person does not have any illness ***(Hoffman, 1993).***

The changes in endocrine function have an influence on nutrient requirements and nutritional status. The nutritional status for its part influences glandular activities ***(Morley, 2006).*** It has also been suggested that dementia patients have higher energy requirements ***(Wolf et al., 1995)*** than healthy individuals, but no evidence for this has been found ***(Donaldson et al., 1996; Poehlman et al., 1997; Mazzali et al., 2002).***

Appetite is regulated by a variety of psychological, gastrointestinal, metabolic, and nutritional factors. Appetite regulators in the central feeding and peripheral satiation systems have been extensively reviewed ***(Morley and Thomas, 1999; Morley, 1996).*** Anorexia is common in patients of advanced age and can lead to drastic weight loss. Anorexia and weight loss also complicate diseases such as cancer, AIDS, and cardiac failure, regardless of age. Consequences of weight loss associated with anorexia can be devastating in all age groups and constitute a special problem in older adults ***(Martignoni et al., 2003).***

Most institutes provide nutritional intervention only after weight loss has occurred ***(Milne et al., 2002; Lauque et al., 2000).*** However, early detection and treatment of anorexia may prevent weight loss, improve health outcomes, and reduce mortality. In the

elderly, complications of anorexia related weight loss include frailty, falls, hip fractures, compromised immunity, and pressure ulcers. Older adults with anorexia associated weight loss are also more likely to die than their robust counterparts ***(De Groot et al., 2002; Ensrud et al., 2003; Morley, 2003).***

Anorexia of aging, or decline in food intake, naturally occurs with aging, even in healthy people. Causes include decline in smell, decreased ability to chew, decreased taste threshold, alterations in gastrointestinal functioning, elevated cholecystokinin levels which increase the gastrointestinal satiety single, increased leptin levels in males, cancer, use of therapeutic diets and decreased cognition. Many of these pathological changes that lead to a decline in food intake are reversible ***(Morley, 2002).***

Mealtime patterns and dietary intake vary across the world, but the most significant change in the oldest age groups compared to younger cohorts is an overall decrease in energy intake and concurrent decreases in macronutrient intake ***(Wakimoto and Block, 2001; De Groot et al., 2004).*** Also, the absorption rate of macronutrients may be delayed and a number of hormonal and metabolic mediators of energy regulation change with aging ***(Roberts and Rosenberg, 2006).***

There are also changes in patterns of diet composition and a reduction in the variety of foods consumed in the elderly population that further reduces the energy intake ***(Roberts and Rosenberg, 2006).*** This lead to decrease in micronutrient intake

especially after the age of 50, reaching its lowest point in the oldest age groups ***(Wakimoto and Block, 2001).***

Older people should be encouraged to undertake regular physical activity, such as walking, as this strengthens and builds up muscle and bone, and increases calorie requirements, which in turn increases appetite. Even chair-bound people should be encouraged to do regular leg and arm movements ***(The Caroline Walker Trust, 2004).***

1.4 Nutrition in the Elderly

Nutrition is an important determinant of health in elderly persons. Over the past decade, the importance of nutritional status has been increasingly recognized in a variety of morbid conditions including cancer, heart disease, and dementia in persons over the age of 65 ***(Basran and Hogan, 2002; Tessier, 2002; Keller et al., 2003; Takashashi et al., 2003; Coombs et al., 2004; Van Wymelbeke et al., 2004).***

It is all too well known that poor nutritional status leads to a decrease in physiological function, increasing the risk of complications and death ***(Rantanen et al., 2000; Cabioglu et al., 2002).*** There is a significant correlation between nutrition and alterations in muscular, immune and cognitive functions ***(Pearson et al., 2001)*** and therefore an improvement in nutritional status is an influencing factor in the improvement of physiological function ***(Bourdel et al., 2001; Magri et al., 2003).***

For older adults, achieving adequate nutrition can be vital as it can help them remain independent in their homes, avoiding premature institutionalization, and improving their quality of life. Not all older adults are able to obtain this level of nutrition without assistance ***(Sinnett et al., 2010).***

In addition, nutrition has a strong influence on the immune system and malnutrition lower immune responses mainly as a result of change in the cell mediated immunity thus exposing malnourished frail older people to infections and bed sores ***(Singer, 2002).*** On the other hand, it has been shown that administration of nutritional supplements is beneficial for those at risk of malnutrition ***(Potter, 2001).*** Addressing nutritional deficiencies has been suggested as a way to reduce infection and to encourage immune responses ***(Lesourd, 1997).*** Protein energy malnutrition is associated with decreased lymphocyte proliferation, reduced cytokine release and lower antibody responses to vaccines ***(Lesourd, 1997).***

Diet and lifestyle over a whole life influence morbidity and mortality. Because of the cumulative effect of adverse factors, it is particularly important for aged people to adopt a diet and lifestyle habits that minimize the risk of morbidity and maximize the prospects for healthy aging ***(WHO, 2002).*** Food habits in aged people are not only influenced by the lifetime preferences and by physiological changes according to aging but also by social aspects such as loneliness, economic situations or conditions and disability.

The quality of diet is often poor among people 85 years and older ***(Wakimoto and Block, 2001).***

Dietary habits, nutrient intakes and aging processes are interrelated and are of particular importance among the elderly. Poor or marginal nutritional status is linked to increased morbidity and mortality in community-dwelling and hospitalized elderly. Low body mass indices and inadequate energy intakes are associated with functional decline and elder failure to thrive ***(Marshall et al., 2001).***

Deficiencies of energy and individual nutrients are associated with decreased cognition .vitamin B-12 deficiency particularly is being problematic in the elderly. Inadequate dietary intakes of energy, folate, vitamin D, vitamin B-6, calcium and zinc have been reported in community-dwelling elderly over 60 y old ***(Marshall et al., 2001).***

Micronutrient deficits namely zinc, selenium and vitamin B6 all of which are prevalent in aged populations have the same influences on immune responses. Nutritional therapy may improve immune responses of elderly patients with protein energy malnutrition. Supplementation with high pharamacologic doses of a single nutrient (Zinc or vitamin E) may be useful for improving immune responses of deficient elderly people living at home. Therefore nutritional deficiency must be treated in the elderly to reduce infectious risk and possibly slow the aging process ***(Lesourd, 1997).*** The prevalence of an inadequate intake of one or

more micronutrients was high, being 47% in elderly women and 24% in elderly men ***(De Groot et al., 1999).***

Also, aspects of food quality beyond nutrient content has become increasingly important with age. Food safety is of particular importance, where unsanitary food preparation methods can encourage bacterial growth, a situation more dangerous among vulnerable elders who may have compromised immune systems. Much care must be taken to thoroughly wash produce, to cook at optimal temperatures and for the proper times, and to transport food safely from its place of preparation to the plate ***(Dietary Guidelines for Americans, 2005).***

The Survey in Europe on Nutrition and the Elderly (SENECA) originally, which was carried out in 13 towns of 12 countries in the years 1988–1989, 1993 and 1999 concluded that a healthy lifestyle among the elderly people was related to a delay in the deterioration of health status and to a reduced mortality risk. Elderly people's inactivity and smoking increased the mortality risk ***(De Groot et al., 2004).***

According to the SENECA study the energy intake among 70-year olds is at the level of recommended intake, but decreases to 20% between the ages 70 and 80 ***(Moreiras et al., 1996).*** No single criterion for energy intake has been found that ensures an adequate micronutrient supply, but adequate nutrient intake was always found in those people with high-energy intakes ***(Schroll et al., 1996).***