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Risk Factors of Malnutrition among Elderly in Geriatric Homes

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Abstract: *Malnutrition is a state in which a deficiency, excess or imbalance of energy, protein and other nutrients causes adverse effects on body form, function and clinical outcome. In the older population, under nutrition rather than over nutrition is the main cause for concern, since its relation to morbidity and mortality is stronger than that of obesity. This study aims to assess risk factors of malnutrition among elderly in geriatric homes. The study was carried out using a descriptive co-relational* ***design*** *at ten governmental geriatric homes. A total population of 189 clients was selected. Data were collected using three* ***tools****; the first tool is an interviewing schedule including questions related to personal data, health profile, and medical history. The second tool is nutritional assessment of elderlywhich was developed by research investigators including four parts, the first part is self-reported questions about risk factors of malnutrition, the second part is history of dietary intake, the third part is clinical observation of malnutrition and the fourth part is observational checklist the physical environment of geriatric homes. The third tool is Mini- Nutritional Assessment Scale.* ***Results****: the mean age of elderly was seventy two, one quarter of elderly suffered from malnutrition however, about one third of elderly were at risk for malnutrition. Risk factors of malnutrition included gastritis, abdominal distention and gases, decreased sense of taste, chronic diseases as hypertension and diabetes mellitus, there were a highly statistical significant positive correlation between total scores of initial risk factors for malnutrition and age at 0.000.* ***Recommendations*** *of this study included (1) conducting further researches to assess risk factors of malnutrition among elderly living in geriatric homes in different governorates (2) planning and implementing educational programs to increase awareness of the elderly towards risk factors of malnutrition and its'preventive measures.*

Keywords*: elderly, risk factors, malnutrition, geriatric homes.*

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I. Introduction

The world is aging. Today, there are some 600 million people aged 60 and over worldwide. This total will double by 2025 and will reach virtually two billion by 2050. The majority of older people will be living in developing countries that are often the least prepared to confront the challenges of rapidly aging societies. Increased longevity is a triumph for public health and the result of social and economic development. However, many individuals will face, as they age, the risk of having at least one chronic disease, such as hypertension, diabetes and osteomuscular conditions (WHO, 2015). The number of people aged 65 or older is projected to grow from an estimated 524 million in 2010 to nearly 1.5 billion in 2050 worldwide (World Health Organization, 2012). Likewise, in Egypt, the proportion of elderly hit about 7.1 percent of Egypt's total population, bringing the total number of elderly to 5.9 million in 2012, according to the Central Agency for Public Mobilization and Statistics (CAPMAS, 2014)

Proper nutrition throughout the lifespan supports healthy aging. Nutrition has multidimensional effects on cognition, mood, functional ability, and survival. Proper nutritional status and diet quality prevent cognitive decline, loss of muscle mass, frailty, and loss of functional ability. Nutrition is also important in preservation of normal immune functioning. Essential macro- and micronutrients and trace elements are needed in maintaining the health of individuals and play crucial roles in immune functioning (Jyväkorpi, 2016)

The prevalence of malnutrition increases with escalating frailty and physical dependence (Dylan Harris, 2010). Currently 16% of people more than 65 years and 2% of those over 85 years are classed as malnourished. Under nutrition occurs in 5–10% of older persons in nursing homes and up to 50% of older patients when discharged from hospital. Numerous studies have shown that when older persons lose weight, they have a double risk for death, even when they are overweight.This is true even in persons who havediseases

due to obesity such as diabetes mellitus. Weight loss also increases the chance of an older personhaving a hip fracture or being institutionalized(WHO, 2014).

Risk factors for malnutrition among elderly includes changes in appetite, limited mobility, social isolation and economic constraints, which are often combined with the presence of chronic diseases and use of many medications, can all adversely affect nutritional status. Hence the need to identify those at risk of malnutrition is critical in providing optimal care and promoting good nutritional status in older adults. Malnutrition may be secondary to certain conditions (disease-related malnutrition), such as cancer, arthritis, diabetes, or emphysema (Abdelrahman & Elawam, 2012)

Loss of muscle mass leads to a reduction in basal metabolic rate by approximately 15% between the age of 30 and 80, and this result in a subsequent reduction in energy requirements, of around 150 kcal per day after the age of 75. Reductions in energy requirements impact on the quantities or volumes of food consumed, people tend to naturally eat less and this in tandem with the physiological changes described, can lead to short falls in micronutrients intakes (Wilma Leslie, 2015**)**

Significance of the study

Malnutrition is common among older people across the continuum of care and results in undesirable consequences for body composition, physical function and clinical outcomes. A research study done in Geriatric Department, Faculty of Medicine, Ain-Shams University, Cairo, Egypt, reported that 15% of Egyptian community-dwelling elderly individuals are malnourished. Malnutrition increases morbidity, mortality and decreases quality of life. Based on the same study, about 35-85% in long-term care facilities were experiencing malnutrition. From these statistics, malnutrition seems to be even more prevalent in long-term care facilities, as compared to community-dwelling older adults. Addressing the more complex needs of the older adult, including nutritional needs, malnutrition represents an important public health issue given the changing demographics (Abdelrahman & Elawan, 2012)

There is no accurate data base about malnutrition among elderly people in geriatric homes, several studies were carried out in an attempt to assess nutritional status among elderly in Egypt, one of those Egyptian studies was carried to assess the nutritional status of the elderly people in the rural area and reported that exposure of those target group to adverse risk factors for malnutrition (Ahmed & Haboubi, 2010).

From clinical observation, elderly people in geriatric homes are more vulnerable to malnutrition due to many factors including absence of food choices, absence of balanced meals and probably lack of enough qualified caregivers in these geriatric homes. Carrying out this research will help in identifying prevalence and understanding risk factors for malnutrition among elderly in geriatric homes that will definitely spot the light on this significant silent health problem among elderly in Egypt. Moreover, conducting this research will add to the nursing body of knowledge and will help the geriatric health nurse in assessment of risk factors for malnutrition and will increase awareness about the problem .

Aim of the study

The aim of the current study is to assess risk factors for malnutrition among elderly in geriatric homes.

Research questions:

Q1- What are the risk factors associated with malnutrition among elderly people in geriatric homes in Cairo governorate, Egypt?

Q2- What are the correlations between malnutrition and the identified risk factors among elderly people in geriatric homes in Cairo governorate, Egypt?

II. Subjects and Methods

Research design: A descriptive co-relational design was utilized to fulfill the aim of this study.

Setting: According to the family and childhood records of the directorate of Ministry of Social Solidarity in Cairo governorate, the number of geriatric homes in 2016 is 66. This number is distributed geographically among the four districts of Cairo governorate (north, east, west & south). All the governmental free of charge or with minimum charge geriatric homes for this study these were ten governmental free of charge or with minimum charge geriatric homes from the total number of geriatric homes in Cairo governorate.

Sample: All residents of the 10 free of charge or with minimum charge geriatric homes were included in the study (189 residents).

Tools for data collection**:** Three tools were used to collect data based on review of literature:

First Tool**:** health assessment tool that was developed by research investigators. It included:personal data about elderly such as age, sex, previous occupation, medical diagnosis, current and previous medical history. Second tool: nutritional assessment tool for elderly that was developed by the investigator, it included the following parts:A- Anthropometric measurements: which included measurement of body weight to the nearest kilogram

using a standard scale, measurement of height to the nearest centimeter using a standard tape measurement, weight and height used to calculate the body mass index (BMI) utilizing the formula BMI= weight in (kg)/height^2 (m^2), measurement of mid arm muscle circumference (MAMC) and mid arm circumference (MAC) to the nearest centimeter, triceps skin fold thickness (TSF) to the nearest millimeter using skin caliber scale. B- Risk factors for malnutrition such as decreased appetite, loss of teeth, loss of taste and smell. C- History of dietary intake: it included nutritional habits, food preference, dislikes and regular meals. D- Clinical observation of malnutrition that included signs and symptoms of malnutrition in (skin, hair, eyes, lips and tongue)E- An observational checklist of geriatric home physical environmental: it included assessment of the client room and kitchen. Third tool: Mini- Nutritional Assessment Scale: Guigoz,Y.(2006): It included two parts: A- screening (contained 6 questions), questions with (yes) take 0 score and questions with (no) take 1, with a total score (0-14). 12-14 Points indicated normal nutritional status, 8-11 points at risk of malnutrition, 0-7 points are malnourished- The second part is assessment (contained 12 questions) , with a total score (max. 30 points), 24 to 30 points indicated normal nutritional status , 17 to 23.5 points indicated at risk of malnutrition , less than 17 points indicated malnourished.

Pilot study: it was conducted on 10% (18 elderly) of total number of elderly to investigate and ensure the feasibility, objectivity, applicability, clarity, and adequacy of the study tools and determined the required time for the interview and this number was included in the study.

Procedure: An official permission was obtained from the Ministry of Social Solidarity, and geriatric directorates. Also written consent was obtained from every participant who accepted to participate in the study. Every elderly was interviewed for (15-30) minutes due to short attention span in every time. Three interviews were carried out with every elderly. The first interview included establishing rapport and explaining the aim, nature and purpose of the study, the second interview with elderly included assessment of elderly, physical environmental observation and observational checklist for the elderly. The third interview included completing anthropometric measurements for every elderly using weighting scale, skin caliber, measurement tape (height, weight, BMI, TSF, MAC, and MAMC). Scales were calibrated before every use. The visit was twice per week from 9am to 5pm until completion of the sample. Data were collected from January till august 2018.

Protection of ethical and human rights: Primary approval obtained from the research ethical committee at Faculty of Nursing-Cairo University. The investigator informed clients, and people in the selected geriatric homes about the purpose and nature of the study and emphasis was made that participation in this study is voluntary; each elderly has the right to withdraw from the study when he or she wants. Written informed consent was obtained from the clients. Anonymity and confidentiality was assured through coding the data. Elderly were assured that data will not be reused in another research without their permission, and data collected was used for this research only.

Validity of study tools: Based on a scientific relevant review of available related literature. The study tools were developed by the investigator. Content validity for the developed tools was tested by five nursing experts in the field of geriatric health nursing, community health nursing and one expert in nutrition.

Statistical Data Analysis

Data were scored, tabulated and analyzed by personal computer using Statistical Package for the Social Sciences (SPSS) program version 20. Descriptive as well as inferential statistics were utilized to analyze data pertinent to the study. Relevant statistical tests of significance and correlations were used to identify the correlations among the study variables. Level of significant was set at $p< 0.05$.

III. Results

Part (I): **Personal data, medical history and dietary habits**

Figure (1): Frequency distribution of personal and demographic data of elderly (n=189)

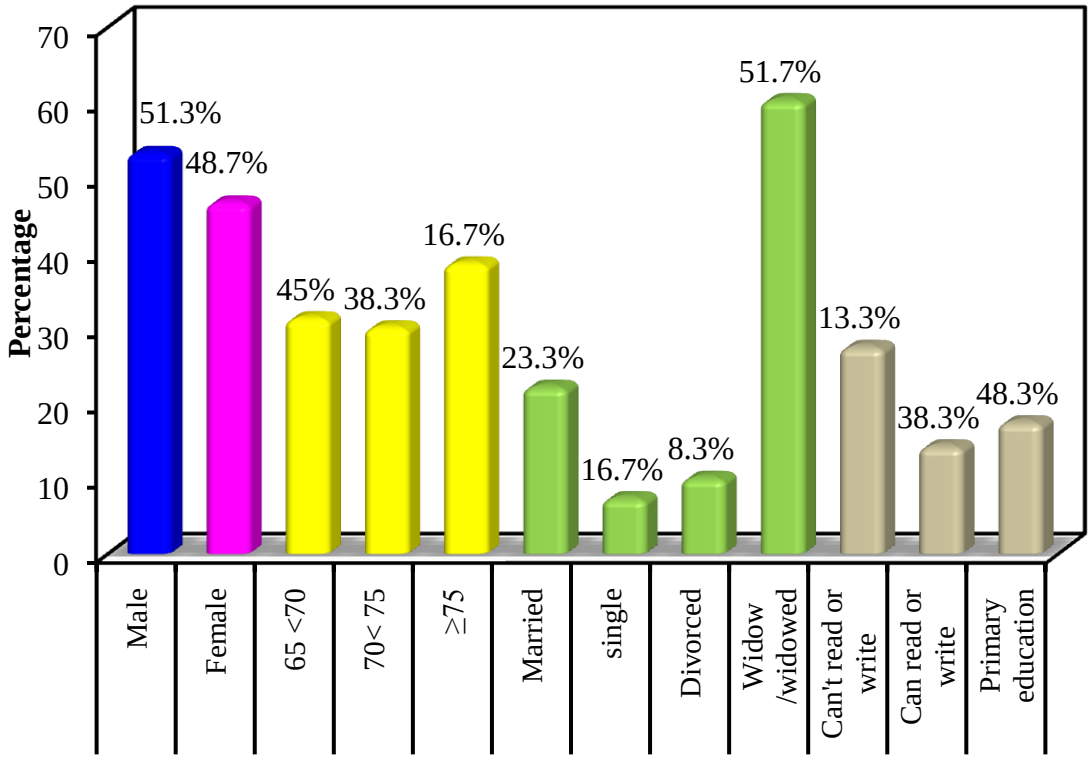


Figure (1) reveals that 61.4 % of elderly aged from 65 to less than 75 years. With mean age 72.9894 ± SD 6.35810. Regarding educational level 27.5% of elderly couldn't read or write. Regarding sex of elderly it was found that 51.3 % were males. Regarding marital statuses 60.3% of elderly were widowed.

Table (1): Frequency distribution of dietary history, health habits and knowledge about nutrition among elderly (n=189)

Variables	No	%
Accurate knowledge about essential food groups	99	52.4
Consumption of food containing the essential food groups	64	33.9
Practice of physical exercise	28	14.8
Exposure to sun light to get vitamin D	60	31.7

Table (1) reveals that regarding knowledge about the essential food groups 52.4% of them knew the essential food groups. Only 33.9% of elderly had knowledge about food containing the essential food groups, 31.7% of elderly exposed to sun light to get vitamin D, 14.8% of elderly practiced physical exercise.

Part II: assessment of nutritional status among elderly.

A- Assessment of risk factors for malnutrition

Figure (2): Frequency distribution of elderly regarding their physical complaints (n=189).

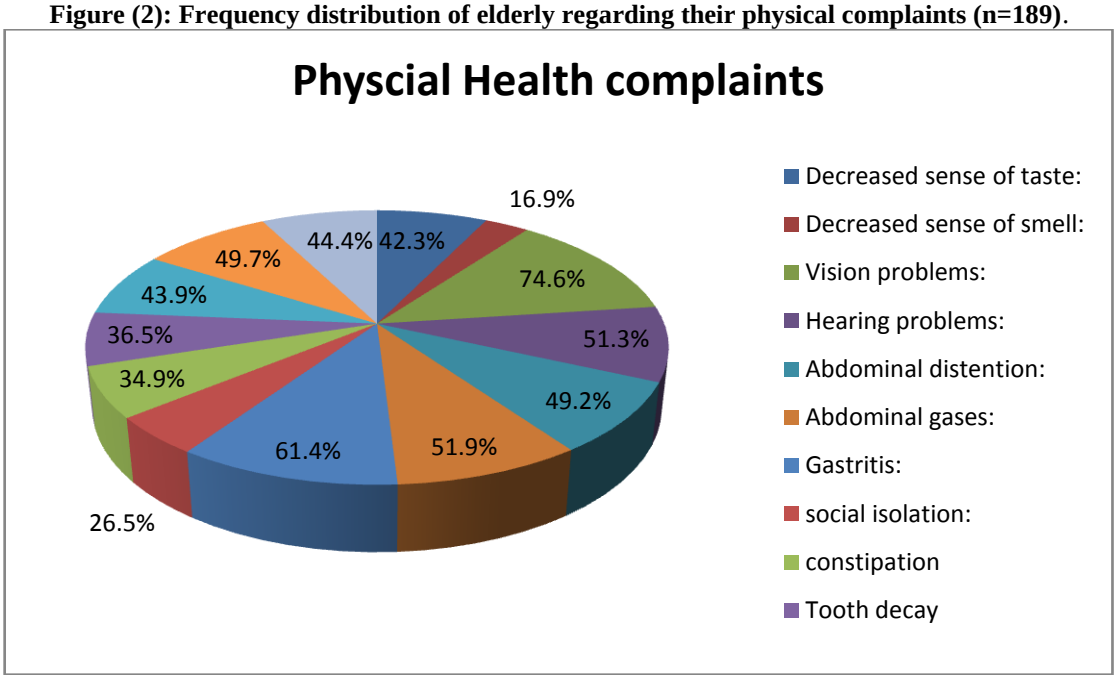
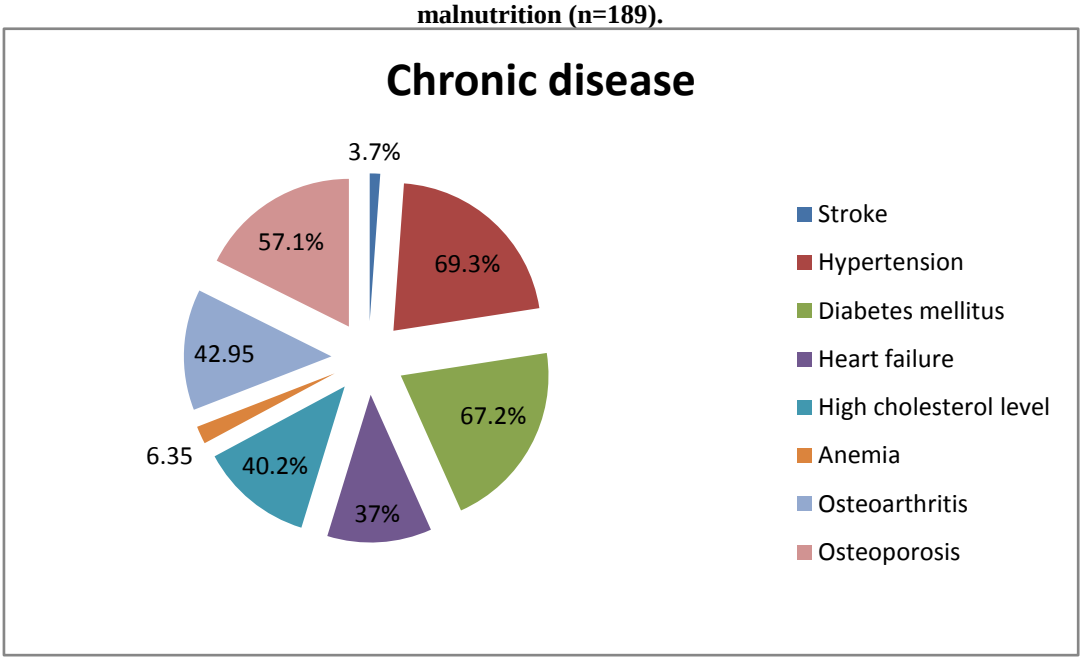


Figure (2)regarding elderly physical health complaints, it was found that 42.3% of them have decreased sense of taste whereas 74.6% of elderly have vision problems, furthermore 51.3% of them have hearing problems, 51.9% of them have abdominal gases, while 61.4% of elderly have gastritis.

Figure (3): Frequency distribution of elderly regarding chronic diseases as risk factors related to elderly malnutrition (n=189).



Regarding medical history of elderly, Figure (3)shows that 69.3% complained from hypertension, whereas 67.2% complained from diabetes mellitus.Furthermore, 42.9% complained from osteoarthritis, while 57.1% complained from osteoporosis

Figure (4): Frequency distribution of elderly regarding medication used. (n=189)

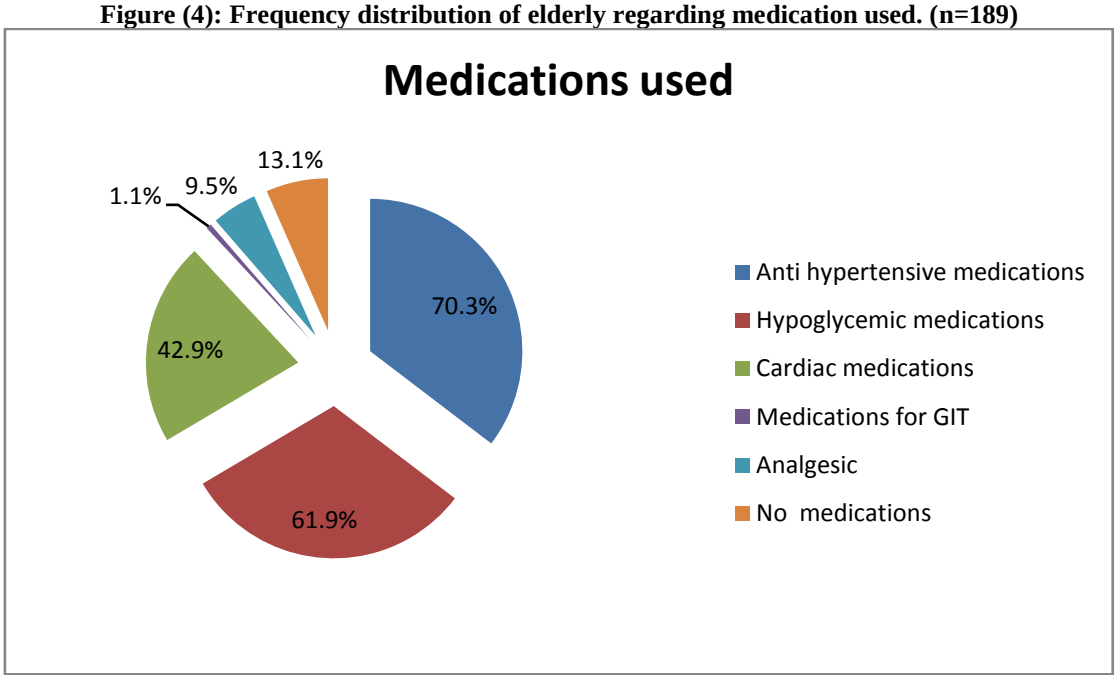


Figure (4) reveals that 70.3% of elderly taking antihypertensive medications while 61.9% taking hypoglycemic medication additionally 42.9% taking cardiac medication.

D- Physical environmental check list:

Figure (5): Frequency distribution of available nutrition in the geriatric home (n=189

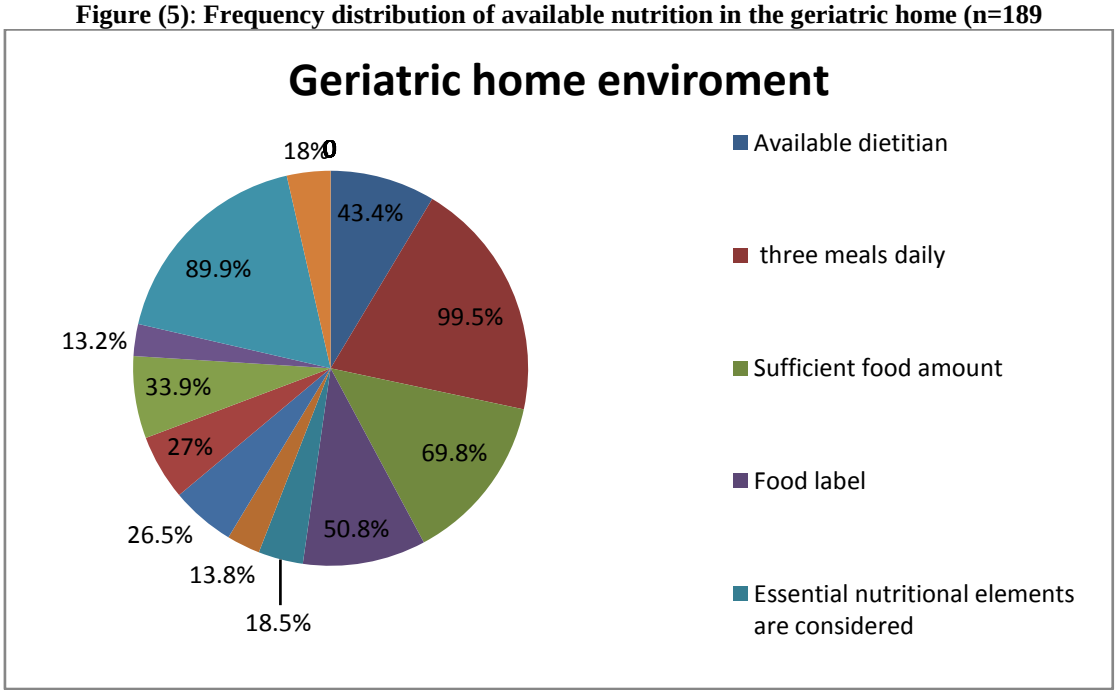


Figure (5) regarding physical environmental 99.5% of the elderly homes introduced three meals daily, while 69.8% of food introduced for the elderly was sufficient. Additionally 50.8% of foods were labeled done by committee of nutrition. Whereas 89.9% of elderly homes allowed for the elderly to bring food from outside.

Part III: Mini- Nutritional Assessment Scale

Table (2): Frequency distribution of elderly regardingMini- Nutritional Assessment Scale screening (n=189).

Variables	No	%
Loss of appetite in the last three months		
Severe loss	13	6.9
Moderate loss	118	62.4
No loss	58	30.7
Weight loss during the last 3 months		
More than three kilograms	6	3.2
Unknown	99	52.4
From 1-3 kilograms	24	12.7
No loss of weight	60	31.7

Regarding loss of appetite in the last three months, 6.9% of elderly had severe loss, while 62.4% had moderate loss and 30.7% had no loss of appetite. Additionally regarding how much loss, 3.2% of elderly lost more than three kilograms, while 12.7% had no loss of weight

Table (3): Frequency distribution of elderly regardingMini- Nutritional Assessment Scale screening) cont. (n=189)

Variables	No	%
Mobility		
Immobile	11	5.8
Able to move from bed	136	72.0
Able to leave home	42	22.2
Psychological stress or acute diseases in the past three months	12	6.3
Neuropsychological problems		
Severe dementia or depression	5	2.6
Moderate dementia	21	11.1
No disease	163	86.2
Body mass index(BMI)		
Less than 19	19	10.1
From 19- less than 21	27	14.3
From 21- to less than23	34	18.0
23 or more	109	57.7

Regarding the ability to move, 5.8% of elderly were immobile, while 72% were able to move from bed, whereas 22.2% of them were able to leave home. Additionally, 6.3% of them had neuropsychiatric diseases in the last three months, while 2.6% had severe dementia or depression and 11.1% had moderate dementia. Regarding body mass index, 10.1% of elderly had less than 19 BMI, while 14.3% of them had from 19 BMI - to less than 21. Furthermore, 18% of them had from 21 BMI - to less than 23, while 57.7% had more than or equal 23 BMI.

Table (4): Frequency distribution of elderly regarding Mini- Nutritional Assessment Scale (assessment) (n=189).

Variables	No	%
Take more than three drugs per day	122	64.6
Bed sores	189	100.0
Number of daily full meals		
one	7	3.7
Two meals	109	57.7
Three meals	73	38.6
Selected consumption markers for protein intake		
Milk product daily	27	14.3
Two times cereal per week	86	45.5
Animal protein daily	76	40.2
Daily intake of fruits or vegetables	126	66.7
Fluids (water, juice, coffee, tea, milk….) daily intake		
Less than 3 cups	102	54.0
From 3-5 cups	87	46.0
Mode of feeding		
Not able to eat alone	5	2.6
Eat alone with difficulty	72	38.1
Eat alone without difficulty	112	59.3

Table (4) reveals that 64.6% of elderly took more than three drugs daily. while 33.3% of them took fruits and vegetables daily, furthermore 54% of elderly took less than three cups of fluids daily , and 46% of them took from 3-5 cups daily.

Table (5): Frequency distribution of elderly regarding Mini- Nutritional Assessment Scale (assessment) cont. (n=189)

Variables	No	%
Self-view about nutritional status		
Have malnutrition	25	13.2
Not sure about nutrition status	127	67.2
Have no nutrition problems	37	19.6
Perception of health status in relation to other people of the same age		
Not on the same quality	41	21.7
Do not know	64	33.9
The same quality	78	41.3
Better than others	6	3.2
Mid arm circumference(MAC) in cm		
Less than 21	62	32.8
From 21-22	33	17.5
22 cm or more	94	49.7
Cuff circumference(CC) in cm		
Less than 31 cm	100	52.9
31 cm or more	89	47.1

Regarding the elderly ability to eat, 38.1% of them eat alone with difficulty, whereas 59.3% of elderly can eat alone without difficulty. Regarding self-view about nutrition status, 67.2% of them weren't sure about nutritional status, whereas 19.6% of them had no nutritional problems. Regarding comparison with others how he or she sees health status, it was found that 21.7% of elderly did not have the same quality, while 41.3% of them were on the same quality. Regarding mid arm circumference, it was found that, 49.7% of elderly had 22 cm or more. Regarding cuff circumference, it was found that, 52.9% of elderly had less than 31 cm.

Part (V): Correlation between the study variables.

Table (6): Correlation between demographic data, health habits and knowledge of the elderly in the study sample and total scores of risks factors of malnutrition (n=189).

Demographic data	MINI-Nutritional assessment		Physical signs of malnutrition		Initial risk factors for malnutrition	
	R value	P value	R value	P value	R value	P value
Age	-.036-	.622	.000	.995	.218	**.003***
Education	.020	.782	-.005-	.948	-.162-	.026*
Medication	.041	.571	-.068-	.350	.286	.000**
Periodical check up	.017	.820	-.087-	.235	-.175-	.016*
Knowledge about essential food group	-.091-	.215	-.089-	.221	-.167-	.021*
Physical exercise	.012	.869	-.186-	.011*	-.112-	.124
Exposure to sun	.079	.280	-.148-	.042*	-.152-	.036*

Table (6): Reveals that There is a highly statistical significant negative correlation between total score of physical signs of malnutrition and physical exercise (p=.011). Also there is a statistical significant negative correlation between total score of physical signs of malnutrition and elderly exposure to sun (p= .042). However, there were a highly statistical significant positive correlation found between total score of initial risk factors for malnutrition and age (p=.003), also There is a highly statistical significant negative correlation between total score of initial risk factors for malnutrition and education (p=.026). There is a highly statistical significant positive correlation between total score of initial risk factors for malnutrition and medication (p=.000). There is a highly statistical significant negative correlation between total score of initial risk factors for malnutrition and periodical check- up (p=.016). There is a highly statistical significant negative correlation between total score of initial risk factors for malnutrition and knowledge about essential food group (p=.021). Finally there is a highly statistical significant negative correlation between total score of initial risk factors for malnutrition and exposure to sun (p=.036)

Table (7): Relationshipbetween total scores of risk factors of malnutrition and the categorization (interpretation) of Mini nutritional assessment among elderly (n=189).

Scores	Have malnutrition	Have a high risk for malnutrition	Have a normal nutritional status	F	P
	M ± SD	M ± SD	M ± SD		
Initial risk factors for malnutrition	37.64 ± 3.03	37.4 ± 3.16	34.5 ± 4.79	1.88	0.155
MINI-Nutritional assessment	15.11 ± 1.66	19.85 ± 1.73	24.5 ± 0.70	191.24	0.000
Physical signs of malnutrition	49.93 ± 5.28	50.16 ± 5.8	46.5 ± 4.43	0.83	0.436

Table (7) indicated that there is a highly statistically significant positive relation between total score of MINI nutritional assessment and total scores of risk factors (p= .000).

IV. Discussion

Malnutrition is the most important nutritional disturbance observed in the elderly and it is associated with functional impairment, prolonged hospital stay, institutionalization increased morbidity and mortality. Malnutrition is critical in providing optimal care and promoting good nutritional status in older adults. Malnutrition may be secondary to certain conditions (disease-related malnutrition), such as cancer, arthritis, diabetes, or emphysema. It is also a condition in its own right (Elwan, 2014)

Risk factors contributing to the development of malnutrition include oral and dental problems, difficulty in swallowing, gastrointestinal (GI) symptoms changing nutritional requirements metabolic disorders, cancer, infections. Physical inactivity may contribute to development of malnutrition and it further accelerates the loss of muscle, stress, and medications may increase energy and nutrient needs and at the same time reduce food intake. Protein and micronutrient malnutrition are associated with increased mortality and co morbidity, loss of muscle mass, depression, impaired immunity, skin problems, and poor cognition(Pai, 2011). So, the aim of the current study is to assess the risk factors of malnutrition among elderly people: co relational study in governmental free of charge or with minimum charge geriatric homes. Result of the current study revealed that majority of elderly were males .This finding agrees with the study done by Khalesi , (2015)on 385 participants in Iran to assess nutritional status and related risk factors in elderly nursing home residents and found that around two thirds were males and one third were females .

Result of the current study revealed that around one third of elderly aged between sixty five to less than seventy years with a mean age of seventy two. This result contradicted with results of a study done by Jyvakorpi , (2016) who studied nutrition of older people and the effect of nutritional interventions on nutrient intake , diet quality and quality of life on nine hundred people in Helsinki a city in Finland and found that two thirds of participants aged between sixty and sixty five years. This result may be due to increased age of the current study participant that could be a risk factor for malnutrition due to decreased functional capacity, decreased income and role change and all of these affect nutritional status and appetite.

The result of the current study revealed that about one third of elderly were not able to read or write. This result was supported by a study done by Chor, Leung, Griffiths, & Leung, (2013) on 4000 participants in Hong Kong a city in China that found one third of the participants had no education. Highly educated people may be able to more enjoy their lives which improve their psychological status and more educated people are able to acquire new information, skills and are more able to utilize the available community resources. The result of the current study showed that more than two thirds of elderly were widows or widowers. This result was supported by a study done by Tessfamichael, Gete, & Wassie, (2014) on 757 elderly people in north Ethiopia to assess high prevalence of under nutrition among elderly people in northwest Ethiopia: a cross sectional study , and found that 61.7% of elderly were widows or widowers.

Regarding medical history and health habits, the results of the current study showed that about one third of elderly were exposed to sun to get vitamin D This finding is contradicted with the study done by El-damhougy et al., (2010) on 750 elderly in Egypt to assess dietary intake and biochemical indicators of nutritional status in an institutionalized Egyptian elderly population and found that two thirds of elderly were exposed to sun to get vitamin D. From the investigator's point of view this result may be due to lack of elderly knowledge about the importance of exposure to sun as a source for vitamin D and the importance of vitamin D in nutrition. Regarding smoking, the results of the current study showed that minority of elderly were smokers This finding completely agrees with the study done by Schueren et al., (2013) on 448 elderly in Amsterdam , Holland to assess the prevalence and determinant for malnutrition in geriatric outpatient and found that minority of elderly were smokers. From the investigator's point of view smoking have an effect on appetite and causes an observed loss of weight and this depends on lifestyle and personal beliefs.

Concerning the previous occupation of the elderly, the current study showed that about one quarter of the elderly were employees and while lower percentage were working manual work. This finding is in contrast with the results of the study, which was conducted by Elagamy, (2015) to assess the satisfaction of 77 elderly regarding the services at 3 geriatric homes in Port Said, Egypt. It was mentioned that, the higher percentage of the elderly (35.1%) were working manual work. This contrast may be related to the current study was conducted in Cairo where governmental and nongovernmental jobs were available, while Elagamy, (2015) conducted the study in Port Said indicated that in coastal cities most people depend mainly on manual works.Results of the current study shows that about one third of elderly complained of hypertension followed by diabetes mellitus.This results agrees with the results of a study done by Abou Faddan & Zarzour , (2013) on 243 participants to assess morbidity profile and its relationship with disability among elderly people residing in geriatric homes and attending geriatric social clubs In Assiut City, Egypt and found that hypertension is the most self -reported chronic disease followed by diabetes mellitus.

The result of the current study revealed that about half of elderly used dentures. These findings goes in the same line with a study by Cort, Palaz,Gil-guill, & Mar, (2015) on 418 elderly in Alicante, Spain to detect malnutrition or malnutrition risk in elderly women and found that about half of the elderly used dentures. These results may be due to elderly loss of teeth and using dentures and this affect nutritional status in many ways. It affect food choice as elderly prefer easily chewable food and semisolid food in addition to dentures problems such as" denture of improper size or lack of knowledge about care of dentures.

The result of the current study revealed that below one quarter of elderly reported that they complain of decreased taste sense, while minority had smell problems. These findings are contradicting with the findings of a study done by Penglim, (2010) on 281 elderly to assess malnutrition and its clinical outcomes in elderly patients from Singapore acute hospitals and found that minority of elderly had swallowing impairment and about one quarter of elderly had poor appetite. This may be a results of individual differences and environmental differences between the two countries and the elderly experienced many normal physiological changes of aging that affect nutritional status such as decreased smell and taste sense, gastritis, abdominal distention and social isolation as socially isolated elderly commonly lose incentive to eat and known to loss their appetite when they take meals alone.Resultsof the current study revealed that above one third of elderly had vision problems, while about one quarter of elderly had hearing problems. This results is contradicting with the results of a study done by Shawky& khater., (2011) on 120 elderly in Egypt to assess nutritional status in older adults with mild cognitive impairment living in elderly homes in Cairo, Egypt and found that about one half of elderly had vision problems, while two third of elderly had hearing problems. This may be due to the elderly experienced a lot of normal physiological changes related to age that affect on nutritional status. This changes include vision and hearing decline and problems as loss of visual acuteness may lead to less activity or a fear of cooking; especially using a stove. Inability to read food prices, nutrition labels or recipes may affect grocery shopping, food preparation and eating. Also hearing problems may lead to decreased ability to purchase and prepare food .This could have an adverse effect on nutritional status.

The result of the current study revealed that below one quarter of elderly had constipation. This results is not totally supported by a study done by Harith, Shahar, Aini, Yusoff, & Bahyah, (2010) on 209 elderly in Malaysia about the magnitude of malnutrition among hospitalized elderly patients in university of Malaya medical center and found that about one third of elderly had constipation. This may be due to that constipation is a normal physiological change among elderly that may result from decreased mobility, decreased types of food served like decreased intake of fruits and vegetables and decreased oral fluids intake. All of these may lead to loss of appetite and hence loss of weight and constipation.As regard the geriatric home environment and nutritional services, the results of the current study revealed that there was a dietitian in one quarter of the selected geriatric homes. Meanwhile, elderly reported that three meals were served for the elderly in half of the selected geriatric homes and the food amount was sufficient for the elderly and minority of them considered special meals for special medical conditions like diabetes and hypertension. Absence of dietitian in the geriatric homes lead to lack of knowledge of people who prepare food about essential food elements and main nutrients and not considering special cases diet like hypertensive and diabetes diet which may lead to a lot of disease complications and affect on nutritional status and habits.

The results of the current study revealed that about one fifth of elderly in the selected geriatric homes were able to prepare their meals. Meanwhile, around half of them were able to bring food from outside the home.This finding is not supported by the results of a study done by Murphy, (2011) in United Kingdom on 1511 elderly who studied malnutrition in a community hospital setting and reported that minority of the elderly were able to prepare food and able to go to shops . This contrast may be related to differences in socioeconomic status and when the elderly was able to prepare food. This enables them to select types of food outside the geriatric homes choices. This makes a wide range of alternatives and enables elderly to prepare food that are suitable for each elderly case and disease considering elderly habits.

Regarding weight loss in the last three months, the results of the current study revealed that about two thirds of elderly suffered from weight loss in the last three months. This result contradicted to the result of a study done by Rita, Suselaine & Maria, (2010) on 236 elderly in Criciúma, Brazil to study malnutrition and associated variables in an elderly population of Criciúma and reported that about one third of elderly suffered from weight loss in the last three months. This contrast may be related to differences in economic levels between the two countries and this weight loss in the last three months may be due to lack of food resources, absence of people who share elderly in eating. This reflects on elderly desire to eat or may be as a result of institutionalization or may indicate acute disease in the last period that causes this sudden weight loss. Regarding how much weight loss of weight in the last three months, the result of the current study revealed that about half of elderly did not know the actual amount of weight loss in the last three months. This result is not supported by the result of a study done by Ziebolz et al., (2017) on 370 elderly living in four nursing homes in Germany who studied oral health and nutritional status in nursing home residents. Results of an explorative cross- sectional pilot study and reported that about two thirds of elderly did not suffer from weight loss in the last three months. This may be due to lack of elderly knowledge about the importance of frequent measuring weight and nutritional screening.

Regarding BMI, results of the current study revealed that more than half of elderly had BMI more than or equal to thirty two. This result is supported by the result of a study done by Ziebolz et al., (2017) on 370 elderly living in four nursing homes in Germany who studied oral health and nutritional status in nursing home residents- results of an explorative cross- sectional pilot study and reported that more than half of elderly BMI had more than or equal to thirty two.Regarding number of drugs consumed per day, results of the current study revealed that about two thirds of elderly consumed more than three drugs per day. This result is supported by the study of Khalesi1, (2015) on 385 elderly people in Iran to study nutritional status and related factors in elderly nursing home residents and reported that most of elderly consumed more than three drugs per day. This may be due to older people are likely to have some health problems for which they take more medications.

Regarding activity of daily living, result of the current study revealed that most of elderly were independent in activity of daily living .This result is not supported by a study done by Mathew, Das, Sampath, Vijayakumar, & Ramakrishnan, (2016) in India on 190 elderly who studied prevalence and correlates of malnutrition among elderly in an urban area in Coimbatore and reported that about one fifth of elderly were dependent in activity of daily living. This result may be due to decreased age of most elderly in the study sample that make them independent in activity of daily living in contrast with the current study.Regarding pressure ulcers, the results of the current study revealed that most of elderly did not have bed sores. This result is not supported by the result of a study done by Orlandoni et al., (2017) in Italy on 284 elderly who studied malnutrition upon hospital admission in geriatric patients and reported that about two thirds of elderly had pressure ulcers. This may be due to that pressure ulcers are the result of immobility decreased immunity and vulnerability of elderly to infection. This may have a direct effect on nutritional status and appetite of elderly.

The results of the current study showed that above one quarter of elderly were malnourished ,however, about one third of elderly were at risk for malnutrition while minority of elderly had a normal nutritional status .This result contradicts result of a study done by Rita, Suselaine & Maria, (2015) who studied early recognition of malnutrition among elderly inAlabama USA on 25 participants and found that nearly one third of older adult patients had normal nutritional status while, above half of older adult patients were at risk for malnutrition and minority of elderly were identified with malnutrition. These differences may be due to lack of resources, facilities and access to food in the elderly homes in Egypt compared to the USA.Regarding correlation between demographic characteristics of elderly , results of the current study revealed that there was a highly statistically significant negative correlation between total scores of physical environment and medication taking ($p=.005$) . This result is supported by Khalesi1, (2015) who studied nutritional status and related factors in elderly nursing home residents inIran on 385 participants and found significant association between nutritional status of the elderly and drug use ($p = 0.02$). This may be due to that medication taking may affect nutritional status and may lead to loss of appetite and may result in side effects and lead to loss of weight.Regarding correlation between demographic characteristics of elderly, results of the current study revealed that there was a highly statistically significant positive correlation between scores of initial risk factors for malnutrition and age ($p=.003$) .This result is not supported by the result of a study done by Pai, (2011) who studied nutritional status of elderly population living in the home versus those living in the community inIndia on 210 participants and found no correlation of MNA scores with age .so it seems that physical age had an essential effect on nutritional status , as people age they are more vulnerable to aging physiological changes that may affect nutritional status.

V. Conclusion

The current study identified the health risk factors of malnutrition among elderly residing in free of charge or minimum charge geriatric homes in Egypt. It revealed that this problem existed across different socioeconomic classes. Education has played much influence on nutritional status of elderly and therefore health promotion strategy should be adjusted according to the different educational levels.

VI. Recommendation

It is recommended to (1) Plan and implement educational programs to increase awareness of elderly towards risk factors and preventive measures for malnutrition. (2) Conduct further researches to assess risk factors of malnutrition among elderly living in geriatric homes in different governorates. (3) Conduct further studies to compare between nutritional statuses of elderly living in private versus public homes.

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