Original Article *Egyptian Journal of Health Care, 2019 EJHC Vol. 10 No.4*

The Effect of Intervention Program for the Elderly with Malnutrition

[(1)]Sabah Abd –El-Mobdy Radwan, [(1)]Omaima Mohamed Easmet , [(2)]Eman Hafez Ahmed
[(1)]Community Health Nursing Department- Faculty of Nursing - Ain Shams University.
[(2)] Faculty of Nursing -Fayoum University- Egypt.

Abstract

Background: Malnutrition in the elderly characterized by insufficient dietary intake, poor appetite, muscle wasting and weight loss. It is associated with several adverse health outcomes in the elderly. **The study aimed to** evaluate the effect of intervention program for the elderly with malnutrition to improve their nutritional status. **Research Design**: A quasi experimental study was used. **Setting:** the study was conducted at outpatient clinics of geriatrics at El-Demerdash hospital at Ain –Shams University .**Sample**: the study involved 74 elderly patients from male and female attending the previously mentioned setting. **Tools: First tool** was self-administrated questionnaire for assessing the elderly demographic characteristics, life style, dietary habits & their knowledge about malnutrition. **Second tool:** Mini nutritional assessment scale to assess their nutritional status. **Third tool:** observational checklist to assess the elderly's oral hygiene practices. **Results:** study indicated that more than half of the elderly were at risk of malnutrition and more than one third of them were malnourished with higher percentage in females. Respectively, the mean of their BMI were 17.9. Additionally, all of the elderly had lack of knowledge. Post implementation of the intervention program, there was a highly significant improvement in the elderly knowledge, nutritional and health status. **Conclusion:** the study proved that the intervention program had remarkable improvement in the elderly knowledge, practice and nutritional status. **Recommendations:** the study recommended that provision of educational booklets for elderly as a guide and reference is very important to motivate them for continuity of following the adequate healthy diets and practices as well as periodic screening and assessment of elderly for early detection of nutritional disorders. Respectively, involve caregivers in the proper nutritional care for the elderly.

Key words: Malnutrition, The elderly, Intervention

Introduction

Malnutrition or under nutrition is a major international health problem, which continues to be unrecognized and therefore, untreated. It is both a cause and a consequence of ill health across the elderly groups and healthcare settings. It is characterized by unintential weight loss of 1% to 2% per week,5% per month or 10% or over a period of 6 months Malnutrition interferes with elderly's' ability to benefit from health treatments and affects every domain of their well-being. Additionally, it increases society's healthcare costs. Poor recognition and monitoring of nutritional status by medical staff can also increase impact of malnutrition risk. Despite the high prevalence of malnutrition in elderly patients, the recognition and documentation of malnutrition is often extremely poor **(White et al., 2015).**

Nutritional status deterioration favored by changes related to age is a common phenomenon in the older adults' population and one of the main problems in geriatrics. Malnutrition or (Under nutrition) is recognized geriatric syndrome and was considered potential, serious threat and one of the ten top causes of death in older people in the United States so, it should be closely monitored .The presence of malnutrition puts individuals at risk of developing problems such as increase risk of infection, delayed wound healing, impaired respiratory function, muscle weakness, falls, fracture and delayed recovery **(Amy, 2017)**.

Malnutrition among older people is clearly a serious challenge for health professionals in all settings as a result of aging process and the body's ability to process food decrease that is called **aging anorexia**, There are other risk factors associated with aging and produce decline in nutritional status such as physiological problems, psychological problems, social problems, medicines, alcoholism and dental problems that decrease ability to chew or swallow food. Malnutrition is a precursor to frailty and has serious consequences including anemia, lower physical strength, greater inactivity and prolonged stay in hospitals that estimated older patients with malnutrition take 40% longer to recover from illness **(Kolessar et al., 2015**).

Malnutrition is often not diagnosed or misdiagnosed, so the rates reported above are likely lower than older adults actual experience so, preventing and management of malnutrition (under nutrition) may improve elderly health and wellbeing. The optimal management to elderly with malnutrition or those at risk of malnutrition understands the main causes leading to the problem to identify how to implement nutritional interventions that provided to elderly patients. To successfully treat malnutrition, timely intervention according to evidence based practice guidelines and protocols for the selection of appropriate nutritional therapy is needed. Success also depends on inter professional coordination among the team members **(Weiss et al., 2016).**

The community health nurse specialist is well positioned to intervene to significantly reduce malnutrition or risk of malnutrition in elderly patients through assessment, prevention and treatment, education and collaboration with other health team professionals and implementing of system level interventions to insure that at risk adult patients are screened, identified and treated for suboptimal nutritional states **(National Association of Clinical Nurse Specialists, 2017).**

Significance of the study:

Malnutrition in older adults, in sense of under-nutrition ,is one of the serious health problems in developing countries because of increase poverty, illiteracy, low socioeconomic status and chronic diseases malnutrition affects a lot of population especially vulnerable groups of elderly.In Egypt, the prevalence of malnutrition in community dwelling older population in urban areas was estimated 14.5% and 41.5% at high risk of malnutrition while, in urban areas 66% of older adults were malnourished and 29.7% were at risk of malnutrition and this considered dangerous threat to the health of seniors in Egypt that may lead to morbidity and mortality **(Abdelrahman , 2017).**

Aim of the study

The study aims to evaluate the effect of intervention program for the elderly with malnutrition through fulfillment of the following objectives:

- ✓ Assessing the elderly Knowledge and dietary habits regarding malnutrition.
- ✓ Identifying the risk factors of malnutrition in the elderly to detect their needs.

✓ Designing and implementing intervention program for elderly with malnutrition according to their needs.

✓ Evaluating the effectiveness of intervention program for the elderly regarding knowledge, dietary habits and risk factors of malnutrition.

Study Hypothesis:

Implementation of the intervention program for the elderly patients will improve their knowledge, practices and health status regarding malnutrition.

Methodology

Research Design:

A quasi experimental design was used.

Setting:

The study was conducted at outpatient clinic for geriatrics in El Demardash Hospital at Ain Shams University

Sample:

The sample size comprised of 74 elderly patients. A purposive sample was used in this study, The sample size included elderly patients that diagnosed with malnutrition or at risk of malnutrition that represent 25% of the total number were (312) between two years 2014 - 2015) attended at the outpatient's clinics in El Demardash Hospital of Ain Shams University and the investigator visited the outpatient clinic to select cases until the defined number was reached taking into consideration the following criteria: mentally intact with age $\geq$ 60 years old, elderly people with BMI <18.5 and accepts to participate in the study.

Tool of Data Collection

First tool: Structured interviewing questionnaire for elderly patients with malnutrition:

This tool was an Arabic questionnaire sheet constructed by the investigator after reviewing related literatures and the content validated by the supervisor. This tool was divided into:

Part (1): It was concerned with socio-demographic characteristics of patients under study as regards: gender, age, educational level, occupation, marital status, monthly income and residential area

Part (2): It was concerned with patients' knowledge regarding meaning of malnutrition, risk factors of malnutrition, signs and symptoms of malnutrition, complications of malnutrition**,** ways of diagnosis malnutrition, treatment of malnutrition, importance of keep balanced nutritional status, content of healthy diet.

Scoring System of patient's knowledge:

The patient's knowledge was given scores 1 mark to correct response and zero to the incorrect answer. The scores of the items were summed-up and the total divided by the number of the items, these scores were converted into a percent score. Knowledge was evaluated and scored according to two levels**:**

Satisfactory knowledge ≥ 60

Unsatisfactory knowledge< 60

Second tool: Anthropometric measurements as (weight, height, BMI), the height was measured to the nearest 0.5 c.m. The elderly patient stood upright barefooted or in thin socks and bareheaded using a height scale measurement to take height. The weight was recorded to the nearest 1 kg using appropriate international standards scale and the weight taken without shoes and with light clothing and body mass index is a measure of body fatness., this tool was used pre& post program implementation It was calculated by the equation adopted from **(WHO, 2016):** BMI= (Weight in kg/Height2) in meters**:**

Normal weight (18.6-24.9)

Under weight (<18.5)

Third tool: Medical record review to assess general health condition of the elderly:

Part (1): Record review of the patient was including 7 closed ended questions as regards: medical history, diagnosis, treatments, Co-morbidity chronic diseases, investigation done pre and post implementatin of the study program.

Part (2):Dietary assessment tool for elderly patients adopted from (Wijnhoven et al., 2013).

This part was including 7 closed ended questions about dietary habits for the elderly people to identify their nutritional habits then followed by table about daily consumption of different types of food and table about weekly consumption of food groups.

Part (3): Life style questionnaire for the elderly patients with malnutrition.

This part was including 8 closed ended questions adopted from **(Suominen et al., 2014) and** modified by the investigator as the following: Hands washing for eating, dental care, bathing, take caring, shopping, sleeping pattern& physical activity practice.

Fourth tool: The Mini Nutritional Assessment Scale (MNA) was used in this study to detect nutritional status in the elderly people (Appendix VI)

The Mini Nutritional Assessment Scale adopted from (Vellas et al.., 2006) is a method has been designed to provide a screening of nutritional risk in old people in order to facilitate nutritional support. It helps the healthcare professionals (physicians, nurses, dieticians' etc.) to assess the nutritional status of the elderly and guides them towards intervention .This scale is composed of 18 items and these items is classified into two the following:

- Normal nutritional status (24-30)

Risk of malnutrition (23.5- 17)-

Malnutrition (< 17)-

Fifth tool: physical examination checklist was used to assess health status and identify risk factors of malnutrition.

This part include questions about the elderly physical examination that may affect nutritional status and may be risk factors for malnutrition and it was based on the modified model proposed by **(Essam El-Din, 2001) and** this questions about problems as colic. Vomiting, constipation, abdominal distention……etc.

Part (2): Observational checklist was used to assess oral hygiene practices for the elderly patients and was adopted from (American Dental Hygienist Association, 2016).

This tool divided into three checklists about teeth brushing, dental floss and denture care this part indicate ideal technique of teeth brush, and dental floss and denture care to detect the elderly practice about those procedures

Content validity and relaibility of tools:

In order to test validity and reliability of the research tools;they were done by 5 of faculty's staff nursing experts from the community health nursing department. The required modifications were carried out accordingly. Then test-retest reliability was applied. The tool proved to be strongly reliable (r=0.8222).

Ethical consideration:

Consents from patients were obtained to ensure willingness to engage in the study

after explaining its purpose and nature, the investigator also provided strict concern to keep their privacy. It haven't any harmful effect on them, the information was confidential and they can withdraw from the study at any time.

Operational design:

The study to be completed passed through different phases included: preparatory phase, pilot study and field work phase.

Ppilot study:

It was conducted on 7 patients with malnutriotion or at risk of malnutrition diagnosis representing 10% of the total study sample, the aim of the pilot study was to evaluate clarity,visibility,applicability as well as the time required to fulfill the developed tools. According to the obtained results, modifications such as omission,addition and rewording were done.It took about one and half month from the half of November to the end of December The number of the pilot study excluded from the study sample.

Field work:

The study field work was done throughout a period of 9 months from beginning of junary 2017 till the end of September 2017 to be complished. Preparation for assessment took four month for developing the data collection tool obtained from literature review.

Intervention program construction:

Phase 1: preparatory phase:

A review of recent, current, national and international related literature in various aspects of the problem was done at this phase using textbooks, articles and magazines.

Phase 2: Assessment phase:

Two days/week, two hours/day (10.30-11.30 am) were used for data collection (pretest), which was carried out through three months; the average time consumed to fill tools was 60 minutes.

Phase 3: Program planning &Implementation:

Planning phase:

Determine learning objectives of the program.

Determine learning contents of the program

Program Implementation:

Program implementation based on conducting sessions plan using different educational methods and media in addition to the use of guiding booklet specifically designed and developed based on patients' assessment needs. Implementation of the program took six months through visited the pre-mentioned setting, to accomplish health education sessions and practice training to study the effect of educational program on the elderly with malnutrition

General objective of the problem:

The general objective of this program was to evaluate the effect of intervention program on the elderly people with malnutrition to improve their nutritional and health status.

Teaching methods and media used are; lectures, group discussion, demonstration and re-demonstration. Suitable teaching aids prepared especially for the program were used such as guiding booklet specifically designed based on student assessment needs and video clips

Phase 4: Program evaluation phase

Evaluation was applied before and after the program through pre, post of an

interviewing questionnaire by using the same tools, in order to identify differences, similarities and areas of improvement, as well as defects and estimate the effect of educational program to improve patient knowledge and practices related malnutrition and observe the change in the patient health.

Statistical design:

The collected data were organized, categorized, tabulated and analyzed. Data were presented in tables and charts using the statistical package for social science (SPSS) version 11.20.The statistical significance and associations were assessed using percentage (%), mean, standard deviation(SD), and Chi square test (x^2) and P-Value.

Result:

Table (1): reveals that 54.1% of the studied sample of elderly people their age ranged between 75 to 84 years old and 58.1% of them were women, 58.1 residents at rural areas, while 49.9% of them live at urban and 58.1% of them were widow, 45.9 % of them were in pension age while 31.1% of them were illiterate. 45.9% of them the average family income were 1000 -2000 L.E, 60.8 of them were live in extended family. Concerning family members 40.5 % of them had family form of (4-6) members.

Figure (1): displays that 35.1 of the elderly patients were smoker post program.

Figure (2): shows that percentage of the elderly people in the studied sample that suffered from risk of malnutrition was 62.2% and elderly were suffered from malnutrition**.**

Figure (3): clarifies that there are highly statistical significant differences between pre &post program implementation according to weekly consumption of different groups of food.

Table (2): demonstrated that there are highly statistical significant differences between pre and post intervention program regarding medical condition of the elderly with malnutrition and risk of malnutrition, where the mean of the weight was 50.5 K\gm. compared with 57.5 K\gm. post the intervention program, while the mean of the body mass index was 17.9 compared with 20.4 post intervention program.

Table (3): indicate highly statistical significance difference pre& post educational program at **P value < 0.0001 in** which 91.9 of the elderly people had unsatisfactory knowledge about the meaning of malnutrition and this changed to 97.3% had satisfactory about meaning of malnutrition post program implementation, while 100.0% had unsatisfactory knowledge about reasons of malnutrition compared with 81.0% had satisfactory about reasons post program implementation

Table (1): Distribution of the elderly people with malnutrition according to their Socio-demographic characteristic (N=74).

Items	No.	%
Age (Years):		
60-64	0	0.00
65-<74	14	18.9
75-<84	40	54.1
85+	20	27.0
Mean= 80.81 SD=6.75		
Gender		
Male	31	41.9
Female	43	58.1
Residence		
Rural	43	58.1
Urban	31	41.9
Marital Status		
Single	3	4.1
Married	25	33.8
Widow	43	58.1
Divorced	3	4.1
Education		
Illiterate	23	31.1
Read and write	21	28.4
Moderate	20	27.0
High	10	13.5
Occupation		
Professional	10	13.5
Worker	5	6.8
Pension	34	45.9
House wife	25	33.8
Average family income(L.E)		
500-<1000	28	37.8
1000-<2000	34	45.9
2000+	12	16.2
Family members number		
1-3	20	27.0
4-6	30	40.5
7+	24	32.4
Family type		
Extended	45	60.8
Nuclear	29	39.2

Figure (1): Distribution of the elderly patients according to their life style (smoking pattern):

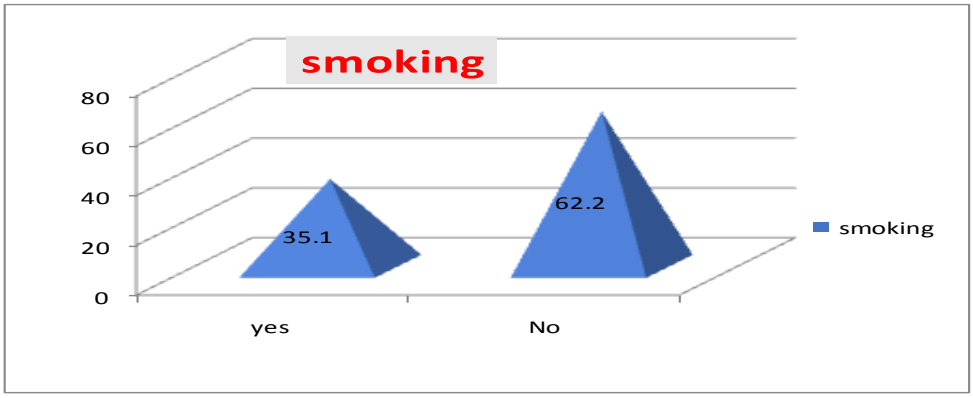


Figure (2): Distribution of the elderly people according to diagnosis of nutritional status (N=74).

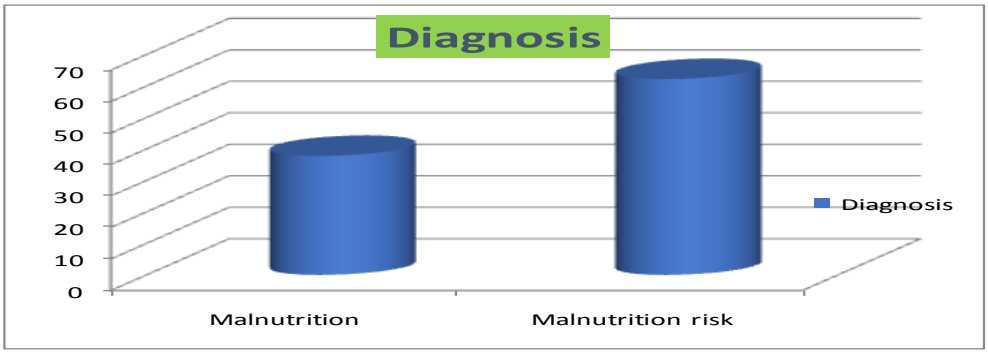


Table (2): Statistical differences of the elderly people with malnutrition according to their medical health record pre and post program (n=74).

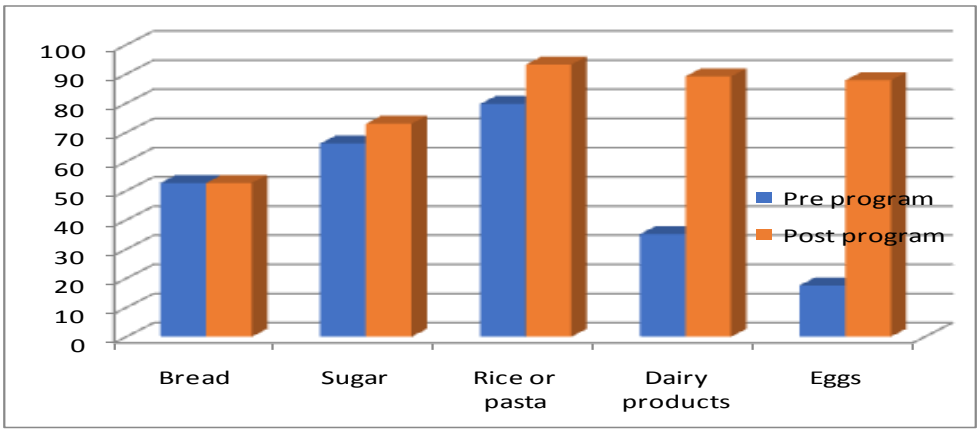
Items	Pre	Post		Chi-square		p-value
	No.	No.	%	No.	%	
Weight(Kg.)	Mean=50.5 SD=4.9	Mean=57.5 SD=5.3		T=8.1		0.0001*
Height(cm.)	**Mean=164.4 SD=7**					
BMI	Mean=17.9 SD=0.52	Mean=20.4 SD=1.05		T=17.7		0.0001*
CBC						
Normal	13	17.6	40	54.1	13.75	0.0001*
Anemia	52	70.3	25	33.8	9.47	0.002*
WBC deficiency	9	12.2	2	2.7	0.00	1.000
Albumin level						
Normal	27	36.5	56	75.7	10.13	0.001*
Low	47	63.5	18	24.3	12.94	0.0001*
Total Protein level						
Normal	43	58.1	60	81.1	2.81	0.094
Low	31	41.9	14	18.9	6.42	0.011*

*significant

Table (3): Distribution of malnourished elderly according to their knowledge pre and post program (n=74).

Items	Pre				Post				Chi-square	p-value
	Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory			
	No.	%	No.	%	No.	%	No.	%		
Definition of malnutrition	68	91.89	6	8.11	2	2.70	72	97.30	55.85	0.0001*
Reasons of malnutrition	74	100.00	0	0.00	14	18.92	60	81.08	60.00	0.0001*
Symptoms of malnutrition	74	100.00	0	0.00	21	28.38	53	71.62	53.00	0.0001*
Complications of malnutrition	74	100.00	0	0.00	27	36.49	47	63.51	47.00	0.0001*
Methods to diagnose malnutrition	73	98.65	1	1.35	31	41.89	43	58.11	40.09	0.0001*
Treatment of malnutrition	74	100.00	0	0.00	29	39.19	45	60.81	45.00	0.0001*
Importance of stable nutrition status	72	97.30	2	2.70	18	24.32	56	75.68	50.28	0.0001*
Complete meal components	68	91.89	6	8.11	12	16.22	62	83.78	46.12	0.0001*
Total	74	100.00	0	0.00	8	10.81	66	89.2	66.00	0.0001*

Figure (3): Distribution of the elderly according to weekly consumption for different types of food intake pre &post program



Discussion

Malnutrition means acute or chronic condition where a deficiency or imbalance of protein, energy and other nutrients that is considered an independent predictor of preterm death in older adults so, **Dietitian Association Of Australia** (DAA) endorse evidence based practices guidelines for the nutritional management of malnutrition in adult patients across the continuum of care recommended only the Mini-Nutritional Assessment short form to identify individuals who are at risk of becoming malnourished ***(Rinechart, 2016)***

Regarding to the socio-demographic characteristics of the elderly patients in the study sample, findings of the current study revealed that more than half of the elderly were in the age group 75-84 years old with the mean age about nearly eighty years (***table 1).*** This finding was in the same line wit**h *Marian et* al., (2013)** who conducted a longitudinal study on elderly in geriatric outpatient clinics in Netherlands to detect prevalence and determinants of malnutrition in geriatric outpatient and stated that the mean age was eighty years. While, this result was contradicted with ***Eman et al., (2013)*** who conducted cross sectional study on 350 elderly in Buragia village at Minina governorate in Egypt for assessment of nutritional status of the elderly population and reported that the mean age of the elderly was sixty seven years. These discrepancies might be due to that increasing poverty and illiteracy in Minina Governorate as it considered one of the developing & poor governorates in Egypt country.

Regarding the elderly patients smoking pattern, the results of this study revealed that two thirds of the study sample was nonsmokers and the most hadn't drugs ***(table 1).*** This result was in accordance with ***Wouleghela, (2013) at*** Thromso University on the elderly patients admitted to hospitals ***to*** detect use of health care according to BMI and risk of malnutrition who revealed that three quarters of the study sample were nonsmokers and hadn't drugs. While, this result was in contrast with ***Yaxley et al., (2015***) who conducted study at Flinders University in Australia for identifying malnutrition in an elderly ambulatory rehabilitation population and reported that more than one half of the study sample were smokers and one quarter of them were alcohol users, this difference might be due to differentiation in life style and habits from country to another.

In relation to the elderly patient's medical history, the results of this study

demonstrated that nearly two thirds of the study sample was at risk of malnutrition and thirty seven of them were diagnosed with malnutrition (***figure 2).***This result was in congruent with ***Mathias et al., (2014)*** who conducted study on Friedrich Alexander University in Germany to detect frequency of malnutrition in older adults and showed that two thirds of the study sample were at risk of malnutrition in hospitals, nursing homes and community dwelling

The findings of this study revealed that the mean of the elderly patient's weight was fifty and half kilograms, the mean of the height was hundred and sixty four c.m and the mean of body mass index was seventeen and nine ***(Table 2***). These results were in the same line with ***Satu Jyvakorp, (2016)*** who carried out study at Helsinki University in Finland on the elderly to assess the effect of nutritional intervention on the nutrient intake and quality of life and stated that the mean of the elderly weight was fifty nine kilograms, the mean of the height was nearly sixty eight and the mean of BMI was seventeen point two.

The results of the preprogram implementation showed that the most of the elderly patients had unsatisfactory knowledge about meaning, methods of diagnosis, reasons symptoms, complications, treatment, importance of adequate nutritional status and meal components, while after implementation of the intervention program the vast majority had satisfactory knowledge with highly statistically significant differences in their knowledge pre and post intervention program implementation ***(Table* 3)**.These findings were in accordance with ***Visser et al., (2017***)who conducted study at Amsterdam University in Netherlands to tackle increasing problem of malnutrition in older population and design malnutrition knowledge hub to describe meaning, determinants, treatment, screening of malnutrition ,physical activity and suitable diet and stated that two thirds of the elder had good knowledge according to malnutrition knowledge hub.

Conclusion

On the light of the results and answers on research questions the study was concluded that:

Malnutrition and risk of malnutrition were prevalent among older population with higher percentage in females, especially with increased age, less education, living alone, unemployment.

The findings of the current study proved a highly statistically significant difference in elderly knowledge pre & post program implementation

The study revealed significant positive improvement in elderly oral hygiene practice pre & post implementation of the intervention program.

Furthermore, there was a highly statistically significant difference in elderly dietary habits and their nutritional status pre & post implementation of the intervention program.

The findings of this study highlight the following recommendations:

❖ An important first step towards better awareness, assessment &screening for malnutrition should be integral part of the comprehensive geriatric assessment.

❖ Periodic screening for malnutrition among older population at geriatric outpatient clinics and all health wards will allow early diagnosis, prompt intervention and prevent preterm death in the elderly.

❖ Provision of educational booklets for elderly as a guide and reference is very important to motivate them for

continuity of following the adequate healthy diets and practices.

❖ Implementation further studies and practical guidelines in all geriatric hospital wards and nursing home residents in order to identify elderly at nutritional disorders and to improve nutritional care in the daily routine.

Financial Support

No funding was received.

Conflict of interest:

No Yes

References:

Amy Mcfarland, Tina M. Waliczek, Jayne, M. Zajicek & Dan Linber L. (2017): Eating Habits and Nutrition Knowledge in older Adults:A Comparison of Gardeners and non-Gardeners; public Health Nutr. 4; 27-23.

Abdelrahman, H.M.M and Elawam, A.E.E. (2017): Nutrition Status in community dwelling older population in an Egyptian Urban area , The journal of Aging research & Clinical Practice; vol (19)No 4

Adeyanju, S. (2016):'Malnutrition in the elderly possible causes & nurses' intervention'; Master Thesis, ARCADA University of Applied Science, published online at May 2016.

Cairo Demographic Center (2014): Aged population in Egypt. Demographic, Social & Economic Aspects.

Caplon, G. (2014): Geriatric Medicine An introduction, 1st edition, Australia, IP Communications Melbourne (Pp. 216-218).

Eman, M. Mahfouz, Eman, S. Mohamed & Tarek, A. Abd-el-rahman (2013): Assessment of nutritional status at Rural Minia, Egypt,Journal of Aging research & Clinical practice, Vol (2);No(3)'retrieved 15 May(2014)at http://www.research gate.net/publication/256708125.

Essam Eldin, I. (2001): Assessment & Screening of nutritional status in the elderly people, article in journal of gerontology, vol.(5).No.2,Pp. 602.

Faller, A., Schuenke, M. & Stuttgart (2012): The Human Body an Introduction to Structure & Functions, 2 rd editions, New York, Thieme, Pp. 33.

Hamdan, S. Alzahrani, Abdelmoneim I. El –sayed and Mohamed S. Alshamarani (2017): Prevalence and factors associated with geriatric malnutrition in outpatient clinic of a teaching hospital in Jeddah, Saudi Arabia, research gate journal, Article in Annals of Saudi Medecine; Doi:105144/0256/4947-2017-346 available at ;http://www.research gate .net/ publications/309151793.

Hickson, M. (2014): Malnutrition and Ageing." Postgraduate

Houston, D.k., Tooze, J.A., Garcia, K., et al., (2017): Protein intake and mobility limitation in community

dwelling older adults: the health ABC study. JANI Geriatric Soc-65.

Marian, A.de., Vireann, S., Gerdein, C., Lighart, M., Tommy, C., Sander, L., Andrea A., et al., (2017): High Prevalence of Physical Frailty Among Community-Dwelling Malnourished Older Adult "A Systematic Review and Meta-Analysis 'Journal of the American Medical Directors Association ;Vol (18) Issue (5)Pp. 374-382.

Matthias, J. Kaiser, **Jurgen, M. Bauer, Christianie R., Yves G., David R., Thomas, E., Karen, E., Chariton, Cornel, C., Wolfgang, et al. (2014):** Frequency of Malnutrition in Older Adults: A Multinational Perspective Using the Mini Nutritional Assessment ,Journal of Geriatric American Society; vol (58) issues 9;Pp. ***1734-1738***.

Rinechart, S.J., Folliard & **Raimondi, M. (2016):** Building Relationship between Senior hunger & health Outcomes "Journal of Nutrition & Dietetics, Vol(116),No(5):Pp. 759-763.

Satu Javakorpi (2016): Nutrition of the older people and the effect of nutritional intervention on nutrient intake, diet quality and quality of life. Doctorate thesis, Department of general practice & primary health care. Faculty of Medicine, University of Helsinki, Finland.

S**uominen, M.H. Finne, Sandelin, E., Soini, H., Pitkala, K.T.L. (2014)**: Nutritional Guidelines for older people in Finland; Journal of Nutritional Health Aging; 18(10):861-867.

The American Dental Hygienist Association, (2016): guidance to oral hygiene retrieved from http://www.adha.org.

The Association of Parental &Enteral Nutrition (2017): ESPEN guidelines on Parental nutrition on geriatrics; Retrieved August 23(2016) from www.Sc.eatrighpro.org/uncategorized/malnutrition/resource-center

Vellas, B., Villars, H., Abellan, G., Soto, M., Rolland, Y., Guigoz, Y., et al., (2006): Overview of the Mini Nutritional Assessment Scale 'its history & challenges, J Nutr Health Aging; 10(6):456.

Weiss, M.M., Purusho, A., Thaman, R. & Morley JE(2016). Effect of liquid dietary supplements on energy intake in the elderly. Am J Clin Nutr.May;75(5):944-7. PubMed

W**hite, J.P. Guenter, G. Jensen, A. Malone, M. Schofield (2015)**: Consensus statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: characteristics recommended for the identification and documentation of adult malnutrition (under nutrition), Journal of Parenteral and Enteral Nutrition, *36* (3) (2015), pp. 275–283 http://dx.doi.org/10.1177/0148607112440285

Wijnhoven, H.A., Schilp, J., Van Bokhorst-de, van der Schueren, M.A., De Vet, H.C., Kruizenga, H.M., Deeg, D.J.H., et al. (2012): Development and validation of criteria for determining under nutrition in community-dwelling older men and women: the Short Nutritional Assessment Questionnaire 65þ. Clinical Nutrition: 31:351–8.

World Health Organization (2016): Malnutrition in older adults, preventing & management the global epidemic, Report of WHO Consultation, world Health Organ Tech Rep Ser; 894: xii, 1-253.

Y**axley, A., Marian, C., and Michell, M., (2015):** Identifying Malnutrition in an ambulatory rehabilitation population: Agreement between Mini Nutritional Assessment and Validated Screening tools; Article in healthcare 2015; 3.822-892lDoi:10.3390 /healthcare3030822 available at www.mdpi.com/journal /healthcare/.