Research Journal of Medical Science

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Assessing the Nutritional Status and General Health in Nursing Homes Elderly People of Ahvaz, 2016

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Key words: Elderly, nutritional assessment, mini-nutritional assessment, nursing homes, general health, general health questionnaire-12

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Page No.: 9-14
Volume: 14, Issue 1, 2020
ISSN: 1815-9346
Research Journal of Medical Sciences

Abstract: Malnutrition is a common problem among nursing homes elderly people. The current study evaluated nutritional status, using the Mini Nutritional Assessment (MNA) and general health, using General Health Questionnaire-12 (GHQ-12) in all nursing homes elderly people of Ahvaz in 2016. This cross-sectional study recruited 130 nursing homes elderly people, comprised of 44 males (33.8%) and 86 females (66.2%) at average of 70.0±7.8 years. The MNA was performed to estimate functional, cognitive and nutritional status and GHQ-12 was completed to general health assessing. SPSS Software was used for data analysis. According to the MNA questionnaire, 13.1% of the elderly were malnourished, 60.0% at risk of malnutrition and 26.9% well nourished. Weight loss, mobility, BMI and Neuropsychological problems showed the strong correlations to total MNA score. One hundred twenty nine elderly people (99.26%) had undesirable general health status (score<3.5). Considering the high percentage of elderly people with malnutrition or at risk of malnutrition and undesirable general health status, the need for intervention, especially, nutritional and psychological intervention is obvious.

INTRODUCTION

The World Health Organization (WHO) defines individuals aged ≥60 as the elderly[1]. The population of the elderly people is increasing because of reduced mortality rates, increased life expectancy and declining birth rate. The phenomenon of population aging is one of the most important economic, social and health challenges of the 21st century[2]. In 2006, 7.3% of whole Iranian population aged 60 and over[3]. Average annual growth of

the elderly population in Iran was about 3.9%, between 2006 and 2011 which will reach 26% by 2050. Life expectancy for Iranian males and females is estimated to be 72.2 and 73.9 years, respectively[4]. Ageing involves physical changes like metabolic, hepatic, gastrointestinal, renal, skeletal, neurological, immunological as well as physiological changes[5]. Aging is associated with various physiological and psychological changes and makes older adults vulnerable to poor nutrition which is followed by a higher risk of malnutrition[6, 7]. Poor nutrition is associated with low quality of life, morbidities and higher mortality due to chronic diseases, sensory defects (vision or hearing loss) taking multiple drugs, poor socioeconomic status, physical disability, sedentary lifestyle and depression. All of these factors make older adults more likely to be malnourished and more prone to hospitalization[8-10]. When malnutrition is prevalent in this group, morbidity and mortality rates are likely to increase[11]. Energy and protein deficiencies lead to changes in body composition and functions such as impaired muscle function, decreased bone mass, delayed wound healing, reduced cognitive and immune function and anemia[12]. Chronic illness, medications, economic hardship, low levels of education, low functional status, low self-perceived health and symptoms of depression are recognized risk factors for developing malnutrition[12-15]. In view of the impact of malnutrition on health and quality of life it has been recommended that the elderly be screened at regular intervals to identify and treat nutrition-related problems as early as possible[16, 17]. An important step toward improving care of elderly people is the early detection of malnutrition and the risk of malnutrition[18]. In this regard, different tools were proposed[19]. Using the Mini Nutritional Assessment (MNA) is currently recommended for identifying those at-risk and who might benefit more from early nutritional intervention[19, 20]. Moreover, its inter and intra-observer reliability was demonstrated, particularly in institutionalized elderly[21]. The aim of this study was to evaluate nutritional status, using the Mini Nutritional Assessment (MNA) and general health, using General Health Questionnaire-12 (GHQ-12) in all nursing homes elderly people of Ahvaz in 2016.

MATERIALS AND METHODS

This cross-sectional study was conducted on all elderly (205 men and women) living in all nursing homes in Ahvaz (public and private) in 2016. The regional ethics committee of Ahvaz University of Medical Sciences approved the protocol of the study. Inclusion criteria was willingness to participate. The exclusion criteria were Alzheimer disease and severe cognitive impairment. Eligible elderly (n = 130; 86 women and 44 men) participated in the study. After explaining the study, a written informed consent was taken from eligible participants. Participants voluntarily accepted to take part in the study. Demographic characteristic of subjects (age, gender, current disease) were collected through a questionnaire. Weight and height of the elderly were measured by trained nutritionists. Weight was measured with light clothing and without shoes, using a portable analogue seca scale. Height was measured using a fixed tape meter with an accuracy of 0.5 cm. Also Mid-Arm Circumference (MAC) and Calf Circumference (CC) were measured. Body Mass Index (BMI) was calculated as weight in kilograms divided by height in meters squared (kg m^{-2}). The nutritional status of each elderly was assessed by Mini Nutritional Assessment (MNA) questionnaire. The MNA is a simple, low cost and noninvasive method that can be done at bedside. This questionnaire composed of 18 different questions and anthropometric measures for ranking participants in 3 levels (malnutrition with scores <17, at risk of malnutrition with 17-23.5 scores and normal status with 24-30 scores). MNA questions grouped into 4 categories (anthropometry, general status, dietary habits and self-perceived health and nutrition states) including: Reduced food intake; weight loss >3 kg of body weight; mobility, bed or chair-bound; psychological stress; neuropsychological problems; body mass index; inability to live independently; taking >3 prescription drugs; having pressure sores or skin ulcers; number of full meals eaten per day; consumption of high-protein foods; consumption of fruits and vegetables; amount of liquids consumed per day; inability to feed self; difficulty in self-feeding; self-view of nutritional status; self-view of health status; mid-arm circumference and calf circumference . The General Health Questionnaire (GHQ) is a measure of current mental health. The General Health Questionnaire-12 (GHQ-12) was completed by the participants since the GHQ-12 is a brief, simple, easy to complete and its application in research settings as a screening tool is well documented. The scale asks whether the respondent has experienced a particular symptom or behavior recently. Each item is rated on a four-point scale (less then usual, no more than usual, rather more than usual or much more than usual) and for example when using the GHQ-12 it gives a total score of 36 or 12 based on the selected scoring methods. The most common scoring methods are bi-modal (0-0-1-1) and Likert scoring styles (0-1-2-3). In the present study, we used the first method.

All statistical analysis were performed using SPSS Software. Means, standard deviations, cross tabulation and frequency tables were used as descriptive statistics.

Spearman's correlation coefficients were determined in correlation analysis. p-values of <0.05 were considered statistically significant.

RESULTS AND DISCUSSION

Among the 130 studied elderly people, 66.2% of the participants were women and 33.8% were men. The mean age of the participants was 68.9±7.8 years. The mean of MNA score was 20.9±3.3 (ranging between 12.5-27). There was no significant difference between male and female on MNA score. Mean of MNA score in male was 20.9±2.7 and in female was 20.9±3.6, p = 0.89. According to MNA, 13.1% of subjects were classified as malnourished (MNA<17), 60.0% were at risk for malnutrition (MNA = 17-23.5) and 26.9% of them were well nourished. The prevalence of overweight (BMI = 25-30) and obesity (BMI = 30) in this study population was 33.9 and 12.3%, respectively. BMI = 23 was higher among females than males (59.3 vs. 52.3%). Table 1 provides descriptions of nutritional and anthropometric parameters in overall population and comparisons between groups as defined by MNA.

Some significant correlations were found between the total MNA score and individual questions. Significant correlations were found between MNA score and weight loss (r = 0.56; p = 0.00), mobility (r = 0.60; p = 0.00), BMI (r = 0.43; p = 0.00) and neuropsychological problems (r = 0.37; p = 0.00).

Some significant correlations were found between the different MNA questions. Correlations were found between BMI and independency (r = -0.24; p = 0.006); BMI and MAC (r = 0.48; p = 0.000); protein intake and CC (r = 0.26; p = 0.003) and skin problems and protein intake (r = 0.71; p = 0.000).

The frequencies of zero points in the MNA questions revealed that 86.2% (n = 112) took more than 3 prescription drugs per day, 24.6% (n = 32) had suffered psychological stress in the past 3 months, 58.5% (n = 76) regarded their health status as poorer than others and 29.2% (n = 38) were unable to give such an estimate. One in five or 20.8% (n = 27) had skin problems, 40% (n = 52) were bed or chair-bound, 20% (n = 26) regarded themselves as malnourished and 41.5% (n = 54) were unable to estimate their nutritional status. In all, 0.0% (n = 0) reported a loss of weight of >3 kg during the preceding 3 months and 32.3% (n = 42) had neuropsychological problems. The questions concerning diet revealed that 19.2% (n = 25) ate one full meal per day, one in 3 (n = 39, 30%) ate vegetables and fruits less than twice daily, 29.2% (n = 38) consumed <3 cups liquids per day, 37.7% (n = 49) were unable to eat without assistance. One in 3 (n = 40, 30.8%) had a reduced total food intake because of loss of appetite.

Most of the studied population had several diseases. Among the diseases and conditions of all the assessed individuals, depression ranked first (62.8%), followed by osteoporosis (47.2%), anxiety (44.5%), hypertension (40%), cardiovascular disease (39.4%), musculoskeletal diseases (29.5%) and diabetes mellitus (26.6%). Depression had a significant effect on malnutrition. Nutrition status in elderlies with depression was more unfavorable (MNA = 20.44±3.37) than non-depressed people (MNA = 21.79±3.07) (p = 0.02). Comparing the nutrition status with regard to the type of disease showed that other disease had no effect on the nutritional status of the participants (p>0.05) (Table 2).

The mean of general health score was 9.26±1.7 within the range of 1-12 of which 129 elderly people (99.26%) had undesirable general health status (score<3.5). Spearman correlation test did not show a significant relationship between general health and malnutrition (r = 0.101, p = 0.254).

Malnutrition is associated with significantly increased morbidity and mortality in independently living elderly, as well as the residents of nursing homes and hospitalized patients[22]. The present study investigated the nutritional status of elderly population. In the present study, there was no significant difference between male and female on MNA score. Khongar *et al*.[23] study even though the score of MNA was lower in women, no significant difference observed between gender subgroups. With 13.1% malnourished and 60% at risk of malnutrition, present study confirmed that malnutrition is

Table 1: Nutritional and anthropometric parameters of nursing homes elderly people of Ahvaz, 2016

Parameters	Whole group (n =130)	Malnourished (n =17)	At risk (n =78)	Well-nourished (n =35)
MNA total (mean±SD)	20.9±3.3	15.1±1.20	20.4±1.9	24.7±0.9
Sex N (%)				
Female	86(100)	14(16.3)	43(50)	29(33.7)
Male	44(100)	3(6.9)	35(79.5)	6(13.6)
Anthropometry				
BMI (kg m^{-2}) female mean±SD	25.0±4.7	21.1±2.8	25.8±5.5	25.7±2.9
BMI (kg m^{-2}) male mean±SD	24.6±4.5	24.4±2.9	24.4±4.5	25.5±5.4

MNA: Mini Nutritional Assessment; BMI: Body Mass Index; Values are expressed as mean±SD or number and percent

Table 2: Nutrition status with regard to the type of disease in nursing homes elderly people of Ahvaz, 2016

Disease	No.[a]	MNA Mean (SD[b])	t-test	p-values
Cardiovascular disease				
Yes	49	21.13±2.64	0.415	0.679
No	77	20.88±2.77		
Diabetes mellitus				
Yes	34	21.13±2.52	0.338	0.738
No	93	20.9±3.22		
Depression				
Yes	80	20.44±3.37	2.26	0.026
No	48	21.79±3.07		
Osteoporosis				
Yes	57	20.69±3.12	0.577	0.565
No	65	21.03±2.45		
Hypertension				
Yes	51	20.41±3.21	1.45	0.148
No	78	21.27±3.34		
Anxiety				
Yes	57	20.42±3.44	1.55	0.122
No	70	20.93±3.33		
Parkinson				
Yes	8	21.0±3.44	0.055	0.956
No	119	20.93±3.33		
Hyperlipidemia				
Yes	33	21.13±3.44	0.361	0.719
No	93	20.87±3.31		
Renal disease				
Yes	22	21.04±2.39	0.149	0.882
No	106	20.92±3.49		
Pulmonary diseases				
Yes	15	20.73±3.32	0.267	0.79
No	113	20.97±3.33		
Musculoskeletal diseases				
Yes	37	20.81±2.52	0.3	0.765
No	91	21.0±3.25		

[a]Because data for all disease were not available for all subjects, the sum of some disease are not equal to the total numbers. [b]SD: Standard Deviation

a health problem in elderly people living in nursing homes which is similar to a study done by Shivraj *et al*.[24] and Aliabadi *et al*.[25] in India and Iran where malnutrition comprised about 11.6 and 12%, respectively.

The prevalence of malnutrition in Khalesi and Bokaie[26] study was 16%. Khongar *et al*.[23] study prevalence of malnutrition and risk of malnutrition were also high (55.9 and 9%, respectively). Since, the MNA score is related to mortality it is important to detect malnutrition because a nutritional intervention can decrease morbidity and mortality. For example, a weight gain of 5% decreased mortality in elderly malnourished institutionalized people[27] and dietary supplementation decreased significantly complications and mortality in elderly patients with femoral neck fracture[28, 29].

The mean BMI value in our study was 24.8±4.6 kg m^{-2}. One eighth of the study group had BMI values higher than 30 which is regarded as obese while 9.2% had an index of <20 and 43.1% had a BMI of <23 kg m^{-2}. Murphy *et al*.[29] study has reported lower mean BMI values (BMI of 23.7 kg m^{-2}) and Saletti *et al*.[31] reported higher proportions of underweight (one third BMI of <20 kg m^{-2} and 64% under 23 kg m^{-2}). In our study mean BMI was more in females (25.0±4.7) than males (24.6±4.5). Similar findings were present in a study by Meenu *et al*.[32] in rural Punjab and also by Chilima and Ismail[33], study in rural Malawi where mean BMI of women was more than men. In our study more proportion of women were malnourished than men. Results of studies done in West Bengal of India[34], Iran[25] and Minia of Egypt[35] are in line with our study. In our study, there is a significant positive correlation between MNA scores and BMI. Our findings are in line with the studies by Aliabadi *et al*.[25] and Soini *et al*.[36] where total MNA scores were positively correlated with BMI.

Also weight loss, mobility and neuropsychological problems showed the strong significant correlations to total MNA scores that are similar to Soini *et al*. (2004) results. In our study correlations were found between BMI and independency ($r = -0.24$; $p = 0.006$); BMI and MAC ($r = -0.48$; $p = 0.000$); protein intake and CC ($r = 0.26$; $p = 0.003$) and skin problems and protein intake ($r = 0.71$; $p = 0.000$). Soini *et al*.[36] study strongest correlations were found between BMI and CC ($r = 0.60$); BMI and MAC ($r = 0.54$); MAC and CC ($r = 0.52$) and the decline in food intake and self-perceived nutritional status ($r = 0.34$).

Rubenstein *et al*.[37] has been reported the proportion of "don't know" responses was very high for self-perceived nutritional status and health status. In the present study, 41.5% of our respondents were unable to estimate their nutritional status and 29.2% were unable to

estimate their health status. Soini *et al*.[36] study in line with our study the frequencies of zero points in the MNA questions was high.

In our study, 129 elderly people (99.26%) had undesirable general health status (score<3.5). Momeni and Karimi[38] study, in Kermanshah, Iran, general health was evaluated using GHQ-28. In this study, the mean of general health score of nursing homes elderly people and the elderly people living in their homes were 30.05±11.47 and 23.59±12.14, respectively. There was a significant difference between them in both groups. Mean of general health score was far from the appropriate cut-off point (19.20)[39]. In a cross-sectional study that was conducted on 120 elderly individuals in Lar, Iran, (40 individuals living in nursing homes and 80 living in their homes), general health was evaluated using GHQ-28. The general health score of the residents of nursing homes was 32.5±11.66 and those living in their homes was 25.7±10. Findings showed that 61.7% of the participants had undesirable general health (cut-off point = 23). Pasha *et al*.[40] evaluated the general health of the elderly people living in nursing homes and in their homes in Ahvaz, Iran. In this study, general health was evaluated using GHQ-28. The mean of general health score of elderly people living in nursing homes and in their homes were 44.14±11.96 and 15.58±7.35, respectively which there was a significant difference between them in both groups[40].

All 3 studies, similar to our study, show that the elderly living in a nursing homes in Iran do not have a good general health condition and it is important to pay attention to the situation of the elderly people living in the nursing home.

CONCLUSION

In conclusion this study showed that nursing home elderly people are at an increased risk of inadequate diet and malnutrition. Based on the MNA, 13.1% of the elderly were malnourished, 60.0% were at risk and 26.9% had a good nutritional status. In other words, 73.1% of the elderly were at risk of malnutrition or had malnutrition. Screening by the MNA can assist to identify nutritional risks and devise prompt interventional or preventive programs to ensure that an old person's nutritional status is well managed. Most of these factors can be prevented if diagnosed and treated early. Also almost all elderly individuals had undesirable general health. Measures such as psychological counseling and health education, are necessary in order to promote this group's general health.

ACKNOWLEDGEMENTS

We would like to thank all residents of the nursing homes, their relatives, managers and staff members, who participated in this study and without whom this research would not have been accomplished.

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