Original Article

The Prevalence of Malnutrition in Elderly Members of Jahandidegan Council, Shiraz, Iran

Seyedeh Maryam Abdollahzade[1,2], Mohammad Hassan Eftekhari[1,2*], Amir Almasi-Hashiani[3]

1. Research Center for Health Sciences, Institute of Health, Shiraz University of Medical Sciences, Shiraz, Iran
2. Department of Clinical Nutrition, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran
3. Deparment of Epidemiology and Reproductive Health, Reproductive Epidemiology Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran

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Corresponding author:
Mohammad Hassan Eftekhari,
Research Center for Health Sciences, Institute of Health, Shiraz University of Medical Sciences, Shiraz, Iran.
Tel: +98-71-37257288
Email: h_eftekhari@yahoo.com

ABSTRACT

Background: The risk of malnutrition is increased in elderly because of insufficient food intake, debilitating diseases, social loneliness, and economical limitations. It not only increases the susceptibility to the development of diseases, but it also decreases quality of life (QOL) in the absence of proper intervention. The purpose of the present study was to determine the prevalence of malnutrition and to identify socio-demographic variables which may be associated with malnutrition in elderly members of Jahandidegan Council, Shiraz, Iran.

Methods: In a cross-sectional study, 180 elderly of Jahandidegan Council were selected through simple random sampling. Following obtaining informed consent, data was collected via two questionnaires of socio-demographic and the Mini Nutritional Assessment (MNA) and then statistically analyzed.

Results: About 1% of the elderly population were malnourished and 13% were at the increased risk of malnutrition. While lower educational level was found to be associated with poor nutritional status of the elderly, no significant association was observed between age, sex, marital status or previous occupation and malnutrition.

Conclusion: Regarding the importance of malnutrition in elderly individuals, designing and developing a comprehensive nutrition education program for this vulnerable group is required to enhance their knowledge and nutritional skill and to improve their QOL.

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Introduction

Life expectancy in the 20th century has increased by 30 years; hence, the aging population is increasing dramatically both in developed and developing countries, including Iran (1). Paying more attention to the nutritional status of the elderly is of great concern, since an undesirable nutritional quality long has been contributed as part of emergence of various diseases, including osteoporosis, diabetes, and cardiovascular diseases, enormous health expenditures, and many economic-, social-, and health-problems, which in turn, require careful planning to deal with (2).

Although, so far, there has been no single criteria for optimal definition of protein-energy malnutrition in the elderly, and this has made it very difficult to diagnose the disease (3), yet, malnutrition in this vulnerable age group is very common (4), since as the

age increases, the risk of malnutrition also increases. Malnutrition occurs mainly due to insufficient food intake to meet the amount of energy or protein required, various chronic attenuating diseases, social isolation, and economic limitation (5, 6), and has a close relationship with a poor subjective sense of health status, a reduction of independence, the need for support and care, increase in the morbidity and mortality, decrease of quality of life (QOL), limitation of capacity of performance, and chronic disabilities (7, 8).

According to the studies conducted so far, the prevalence of malnutrition in community-dwelling elderly individuals is reported variously, and as expected, is even much higher in nursing home residents or those under the care (9). The aim of the present study, therefore, was to determine the prevalence of malnutrition, and to identify socio-demographic variables which may be associated with malnutrition in elderly.

Materials and Methods

This cross-sectional study was conducted on 180 elderly people referred to Shiraz Jahanidegan Council using simple random sampling method in the winter of 2009. People aged 55 or older (according to the minimum age of admission to the center) were enrolled in the study following obtaining informed consent. The weights, heights, mid-arm and calf circumferences (MAC and CC) of the participants (if necessary) were measured using the Seca scale, to the nearest 0.1 kg, and a flexible non-elastic tape, to the nearest 0.5 cm. MAC and CC were measured based upon standard protocol; i.e. halfway between the acromion process of the scapula and the olecranon process at the tip of the elbow (10), and at the maximum circumference of the lower non-dominant leg with the participant's leg bent 90° degrees at the knee, respectively (11). Body mass index (BMI) was then calculated as weight (in kilograms) divided by height squared (in meters).

Data was collected by face-to-face interview method using two questionnaires of socio-demographic information, and Mini Nutritional Assessment (MNA). The Socio-demographic information collected included age, sex, marital status, occupation, and educational level. The MNA questionnaire was also comprised of a series of questions concerning lifestyle, anthropometric information, and general-, nutritional-, functional- and mental-status of the elderly in two general sections (i.e. screening and assessment). The questionnaire categorized the nutritional status of the elderly persons into 3 groups including normal nutritional status, at risk of malnutrition, and malnourished, based upon malnutrition indicator score (12-14).

Each of the two sections of the MNA questionnaire was consisted of 6 and 12 questions, respectively. The minimum indicator score for each of the above individual sections, and therefore, the total questionnaire was zero, while the maximum respective values were 14, 16 and, 30, respectively. If a participant obtained an initial MNA score of 12 in the first section of the questionnaire (i.e. screening), there was no need to complete the second one, which itself contained data on MAC and CC measures. The obtained scores categorized elderly into 3 diagnostic groups: normal nutritional status ($\geq$24), at risk of malnutrition (17-23.5), and malnourished (<17) (15). Collected data was then analyzed using SPSS 11.0 (SPSS, Inc., Chicago, IL, USA) through Kolmogrov-Smirnov, one-way ANOVA, Mann-Whitney U, Chi-Square, and t-tests and represented as mean±standard deviation (SD). P value less than 0.05 was considered as a significant level.

Results

A total of 180 elderly members of Jahandidegan Council including 121 women (67.2%) and 59 men (32.8%) were enrolled. Table 1 shows the mean and standard deviation (SD) of age, anthropometrical values, as well as the respective scores of the questionnaire sections categorized by the gender of the respondents. The mean age of the study population was 65.4±7.5. Men were older than women (69.1 vs. 63.6). The mean BMI, screening-,

Table 1: Distribution of anthropometric characteristics and the indicator scores of the two main sections of the MNA questionnaire categorized by gender.

Variable	Male	Female	Total
Age (y)	69.1±8.8	63.6±6.1	7.5±65.4
Height (cm)	166.3±16.1	156.8±6.5	159.9±11.5
Weight (kg)	73.5±16.6	64.6±9.7	67.5±13.0
BMI (kg/m²)	25.4±3.9	26.2±3.6	26.0±3.7
Screening indicator score	12.8±1.3	12.3±1.8	12.4±1.7
Assessment indicator score	11.6±1.5	12.0±1.4	12.0±1.5

MNA: Mini nutrional assessment

and assessment-indicator scores of the surveyed subjects were, 26.0±3.7, 12.4±1.7, and 12.0±1.5, respectively.

Of the study population, 155 (86.1%) had a normal nutritional status, 23 (12.8%) were at risk of malnutrition, and 2 (1/1%) were malnourished. Table 2 shows the distribution of socio-demographic variables, categorized by the status of malnutrition. Since the number of malnourished people detected was very few, in order to investigate the association between malnutrition and socio-demographic variables, the malnourished elderly were merged with those at risk of malnutrition.

As seen in the table 2, a significant association was found between the elderly educational level and developing malnutrition (P=0.003). Indeed, the highest levels of malnutrition were found among illiterate elderly. Other socio-demographic characteristics of the study population, including age (P=0.7), gender (P=0.17), marital status (P=0.14), and former occupation (P=0.52), were not significantly associated with malnutrition.

Discussion

Malnutrition, as a common principal problem of elderly, is significantly attributed to morbidity and mortality (3, 16). Determining the prevalence of malnutrition in elderly and its association with socio-demographic variables was studied in a sample of 180 subjects referred to Jahandidegan Council, Shiraz, Iran. The findings of the current study showed the prevalence of malnutrition as 1.1%, and approximately 13% of elderly were at increased risk based upon the data from the MNA questionnaire, as a part of geriatric nutritional valuation (17).

Among the free-living Iranian elderly, prevalence of malnutrition various between 0% in Tabriz (18) to 12% in Khorasan-Razavi (8) provinces (Table 3). The overall estimated prevalence of malnutrition among Iranian elderly and those living in homes was reported to be 12.2%, and 9.6%, respectively in a meta-analysis conducted in 2016 (19). Similar values have been found previously in other countries: 2% for Taiwan (20), and 3.3% for Spain (21). The result of current study, however, is much lower than the reported values for rural regions of Bangladesh (25.8%) (22), and south India (14%) (23), Netherland (23%) (24), and Japan (19.9%) (25).

The difference is at least partially rooted in the particular culture of Iran and the role of family in caregiving and thus, improving the nutritional status of the elderly (8, 26). Moreover, the lower age of the study population surveyed can cause the difference. The prevalence of at-risk population found in the current study in community-dwelling-elderly (13%), is well comparable to those reported in previous studies for Rasht, Iran (13.5%) (27), Tabriz, Iran (6.8%) (18), and Taiwan (13.1%) (20). Several studies conducted in Iran (28-37) and other countries (22-25, 38), however, reported higher values. The prevalence of nursing home-dwelling elderly, however, as expected, would be much higher both in developed and developing counties (9).

In the present study, the prevalence of malnutrition in single old people was higher than their married peers; however, the difference was not statistically significant. Regardless of significance, our finding is confirmed by other researchers (37), and has been suggested to be at least partially due to the dis-sociability and the social isolation of single elderly. Poverty and loneliness are among other

Table 2: Distribution of socio-demographic variables in terms of nutritional status (normal vs. abnormal) of the study population.

Variable		No (%) Normal nutritional status	No (%) Abnormal nutritional status	Total No	P value
Gender	Female	(83.5) 101	20 (16.5)	121	0.17
	Male	(91.5) 54	5 (8.5)	59	
Marital status	Single	(79.6) 39	10 (20.4)	49	0.14
	Married	(88.6) 116	15 (11.5)	131	
Occupation	Administrative officer	(88.1) 52	7 (11.9)	59	0.52
	Technical worker	10 (76.9)	3 (23.1)	13	
	Freelance worker	2 (100.0)	0 (0.0)	2	
	Freelance job	19 (95.0)	1 (5.0)	20	
	Others	72 (83.7)	14 (16.3)	86	
Educational level	No schooling	2 (40.0)	3 (60.0)	5	0.003
	Primary school level	69 (82.1)	15 (17.9)	84	
	Secondary school level	71 (91.0)	7 (9.0)	78	
	Higher education	(100.0) 13	0 (0.0)	13	
Age	--	65.3±7.5	65.9±7.3	--	0.70

City, Country	Total (age)	Malnutrition (%)	At risk (%)	More prevalent malnutrition	Reference
Bojnourd, North-Khorasan, Iran	120; (≥55 y)	7.5	62.2	Women>men, low>high educated, smoking>non-smoking, those living alone>those living with others	(Nabavi et al., 2015)
Gorgan, Iran	541; --	4.8	44.7	Those living alone>those living with others	(Lashkarboloki et al., 2015)
Isfahan, Iran	248; (≥60 y)	3	37	The illiterate>literate subjects, with a higher>lower income	(Eshaghi et al., 2007)
Isfahan, Iran, rural	370; (≥60 y)	3.8	32.7	No association with any socio-demographic variable.	(Vafaei et al., 2013)
Iran	1350; (≥60 y)	5.5	41.3	__	(TaheriTanjani et al., 2015)
Kashan, Isfahan, Iran	120; (≥60 y)	5.8	68.3	__	(Joghataei and Nejati, 2006)
Khorasan-Razavi, Iran	1962; (≥60 y)	12	45.3	Women>men, rural>urban subjects, non-educated>educated, those living alone>those living with others, and the unemployed>employed	(Aliabadi et al., 2007)
Khorasan-Razavi, Iran	1495; (≥60 y)	11.5	44	Women>men, rural>urban subjects, non-educated>educated, those living alone>those living with others, employed, farmers or animal farmers, laborers and unemployed>self-employed, those on drug supplement>not on drugs	(Mokhber, et al., 2011)
Markazi, Iran	205; (≥65 y)	8.3	37.1	__	(MalekMahdavi et al., 2015)
Rasht, Iran	194; (≥60 y)	3.9	13.5	Men>women, lower>higher income	(masomy et al., 2012)
Tabriz, Iran	184; (≥60 y)	6	46.7	__	(Payahoo et al., 2013)
Tabriz, Iran	88; (≥65 y)	0	6.8	__	(Saghafi-Asl et al., 2017)
Tabriz, Iran	1041; (≥60 y)	2.5	26.7	Women>men, single>married, non-educated>educated	(Azizi Zeinalhajlou et al., 2017)
Taiwan	2890; (≥65 y)	2	13.1	__	(Tsai, et al., 2008)
Bangladesh, rural	457; (≥60 y)	25.8	61.7	Women>men	(Kabir et al., 2006)
South India, rural	227; --	14	49	Women=men	(Vedantam et al., 2005)
Japan	226; (≥65 y)	19.9	58	__	(Kuzuya et al., 2005)
Netherland	6701; (≥65 y)	22.8	31.2	__	(Neyens et al., 2013)
Spain	3460; (≥65 y)	3.3	__	Women>men and people with a lower>higher income	(Ramon et al., 2001)
Turkey	2327; 72.1 y	__	28	__	(U¨lger et al., 2010)

Table 3: Prevalance of malnutrition in free-living eldery estimated by MNA queationaaire, worldwide.

MNA: Mini nutrional assessment

effective factors influencing on the food intake and malnutrition development (39). In agreement with the results of several studies (8, 28, 30, 34, 37), lower educational level was found to be associated with poor nutritional status of the elderly. Since as the educational level of older adults rises, mean

income levels, lifestyle, and, thus, nutritional status of the elderly people also increases (8). In addition, higher educational level was suggested to decrease malnutrition through increasing both health- and nutritional skills (2). In contrast to the findings of some other studies suggesting that women were more vulnerable to developing malnutrition (8, 21, 22, 28, 34, 37), no association between gender and malnutrition category was found in the present study.

Conclusion

In general, the results of this study indicated that 1.1% of the elderly were malnourished. Approximately 13% were at an increased risk of developing malnutrition, and almost 86% had normal nutrition profile. It seems necessary to identify the extent of the disease at an early stage in order to apply on time appropriate nutritional interventions.

Acknowledgement

Conflict of Interest

None declared.

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