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A Survey on Nutritional Status in Elderly with Diabetes

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Abstract

Aim: Malnutrition prevalence is unknown among elderly patients with diabetes. Nutrition therapy is an essential component in the treatment program for diabetics. Malnutrition is a clinical disorder and a common risk factor in older patients with diabetes, which can affect their health. The main purpose of this article is to evaluate the nutritional condition of elderly with diabetes in Babol City, Iran.

Methods: This cross-sectional study was done in Babol City during January-April 2017 on 200 older patients with diabetes. Malnutrition was assessed with the Mini-Nutritional Assessment (MNA) approach. The patients were followed up until discharge. Data analysis was carried out using descriptive statistics methodology, and correlation among variables was determined by the Chi-square, T-test, and One Way ANOVA.

Findings: The results showed that about 50% of the elderly patients were suffering from malnutrition, and 20% had normal nutritional status, and approximately 30% were exposed to malnutrition.

Conclusion: It is possible to identify people at risk for malnutrition. These individuals are suffering from malnutrition more likely due to lower level of caloric intake that can be easily corrected by nutritional intervention. It is necessary to improve the status of elderly diabetic patients with malnutrition suffering by administering normal nutritional status and special attention.

Keywords: Elderly, Mini-Nutrition Assessment, Type 2 Diabetes

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Introduction

Healthy old age is one of the most serious challenges for the European societies. By 2025, about one third of the population in Europe will be closer to 60 years old or more, with a significant increase in the number of people over the age of 80, these demographic changes will have a significant impact on the basic domains of social life, such as economics and health care [1]. Growing population of the elderly in the world has turned into an important issue in recent years, especially in the developing countries. Today more than 600 million people around the world are over the age of 60 years, and based on some researches, it will increase to 1 billion by 2020, and to 1.970 billion by 2050. Iran's elderly population has had an accelerating rate during last decade. According to some studies, the proportion of elderly men and women over 65 years would be increased to 9.1% in 2020 [2]. The epidemiology of diseases has now changed in comparison with the past, and the non-communicable diseases are increasing. Only the irreducible factors such as age, gender and family history are not the cause of non-communicable diseases, but also other factors such as lack of proper physical activity, lack of balanced diet, obesity, etc. should be corrected as well. They have a major role in this group of diseases [3]. Undesirable nutritional status in the elderly leads to the emergence of diseases such as diabetes, cardiovascular diseases (CVDs), etc. [4]. Diabetes is considered as one of the most important health system problems in the world. Approximately 5 to 10% of diabetics suffer from type 1 diabetes, and 90-95% of them have type 2 diabetes. Type 1 diabetes or insulin-dependent diabetes usually affects adolescents and young people, especially in people younger than 30 years old. But type 2 diabetes is a disease of middle-aged people who are obese [5]. Diabetes is associated with an increased risk of developing the disease. Malnutrition and other syndromes have been reported. Malnutrition outbreaks have been reported and elderly diabetic patients have been institutionalized in Iran. In this regard, determining nutrition status is a good indicator of the health in the elderly. However, identifying malnutrition in the elderly community is not easy, since malnutrition is a multi-factorial problem. Assessing the nutritional status of this stratum is more difficult due to their physical, psychological and social constraints [6]. Malnutrition is a common problem that affects 30-50% of bedfast diabetic elderly people [7]. Nutrition is one of the most important components of health care [8]. The results of epidemiological studies have revealed that malnutrition has a strong relationship with high mortality in elderly people [9]. Based on a research done

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on the elderly in Kashan, 68.3% of them were malnourished, and 5.8% were suffering from malnutrition [10]. Also Aliabadi introduced factors such as education, sex, income, and illness as effective factors in nutrition status [11]. Fakharzand (2013) also found that in the Markazi Province of Iran, 19.6% of the elderly were malnourished, 3.53% were at risk of malnutrition, and only 1.27% had a good nutritional status. There was a significant relationship between underlying disorders and the nutritional status of the elderly [12]. In young adults, type 2 diabetes is commonly associated with obesity and insulin resistance. The current treatment recommendations are based on lifestyle modifications and an incremental drug treatment to achieve glycaemic control [13]. However, this approach may lead to inappropriate defects in elderly patients, while diabetes is associated with malnutrition. Aging is accompanied by a significant reduction in body weight and food intake [14]. The prevalence of malnutrition in diabetic and non-diabetic individuals has been highlighted, and malnutrition may be associated with impaired function [15].

Nutritional status assessment is the first step in designing a successful nutrition management program, and requires the use of appropriate tools for measuring the nutritional status of the elderly population. The appropriate approach can be applied in order to address the effects of malnutrition in elderly people. It is necessary to recognize these problems to enhance the awareness of the diabetic elderly about the factors that can affect their nutritional condition. In addition, appropriate plans should be designed to identify the malnutrition and other risk related to it. As a result, this study was conducted to determine the nutritional status of elderly people with diabetes in Babol City.

Materials and Methods

This study is a randomized clinical test, and the population includes diabetic elderly ≥60 years in Babol's health centres. The criteria for entering were at least one year of definitive diagnosis of diabetes, and having no cognitive problems. Exclusion criteria included unwillingness to participate in the study and absenteeism. The number of participants in the study was 200 individuals who were randomly selected and divided into two intervention and control groups (100 people in each). By using cluster sampling method, we randomly selected eight health houses; four of them were considered as an intervention group and the rest in the control group. The information of both groups was collected three months after the intervention and after getting the permission of clinic officials.

The main objective of the study is the assessment of elderly's nutritional condition.

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They were assured that the information of the questionnaire would be remained completely confidential. Then oral satisfaction was taken, and they were assured that the participation in this study is optional. To investigate the general information of the elderly, a demographic questionnaire was used. An MNA questionnaire was applied to evaluate the nutrition of the elderly. Furthermore, nutrition education intervention was done for the intervention group during one month in four educational interviews. The MNA has been predicted for credibility by showing its relevance to the evaluation of the final health outcomes in fragile elderly patients. This tool also considers relevant physical and social issues. The questionnaire consists of two parts: the first part of the screening section included 6 questions, which was used for all participants. The research units received a score of 12 and higher. The nutrition status is "normal" with a score of 11 or less. If the person's score is 11 or less, the questionnaire is required to complete a further evaluation section for the individual. The supplementary part of the questionnaire on malnutrition contains 18 questions and measures malnutrition. According to the questionnaire scoring (maximum 30 points), the subjects were divided into three groups: 1) Natural nutrition (score 24 and more), 2) At high risk malnutrition (scores 17 to 23.5) and 3) Malnutrition (scores below 17). Different departments such as the US Department of Health and Human Services, the National Center for Health Statistics, and Centers for Disease Control and Prevention have confirmed the reliability of these terms with a 98% Cronbach's alpha coefficient [16]. To determine the validity of the questionnaires, content validity was used. A sample of 15 professors and experts from Tehran's School of Health was provided. After collecting their suggestions and correctional views, the final questionnaire was set and evaluated for determination. To determine the weight, a fixed scale with a precision of 0.5 kg was used, and to measure the height, a cotton gauge with a precision of 1/0 cm was used. The middle of the arm and the muscle behind the skin were measured by a meter with a precision of 1/0 cm. Data analysis was done using Chi-square, TEST-T, T-test, couples, ANOVA and regression analysis in SPSS software (ver. 21).

Findings

As shown in the research method, the participants in this study were over 60 years old, and in the intervention and control groups, the maximum age of the participants was 81 and 80 years with the mean of 68.09 and 36/67 years, respectively. The results of independent t-test showed no significant differences between the two groups

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(P=0.83). Other demographic variables were in the same situation, and there was no significant difference between the two groups (Table 1).

Table 1: Comparison of the demographic variables of the subjects in the intervention and control groups (mean ± standard deviation and range)

Rating		Control group	Intervention group	P value
Age		67.36± 5.391	68.09± 5.43	0.83
sex	Female	48	48	0.99
	Male	52	52	
Education	Below the diploma	100	88	0.594
	Graduate	20	80	
Duration of diabetes		14.42± 4.661	13.95± 4.217	0.521
Family history of diabetes		56	49	0.25

In the intervention group, 22% of the people had normal nutrition, 29% were malnourished, and 51% were at risk of malnutrition. In the control group, 20% had normal nutrition, 30% were at risk of malnutrition, and 50% were malnourished (Table 2).

Table 2: Frequency distribution of nutritional status in the elderly diabetics

Rating	Group	Percent	Frequency
Less than 11	Intervention	19	19
11-17	Intervention	30	30
17-24	Intervention	29	29
More than 24	Intervention	22	22
Less than 11	The witness	18	18
11-17	The witness	32	32
17-24	The witness	30	30
More than 24	The witness	20	20

Based on the responses of the individuals to the questions of nutritional review, the average point scored 23.29 with a standard deviation of 45.3, with a minimum score of 13 and a maximum of 29. In addition, according to the classification of the obtained grades, almost half of the subjects had a normal nutritional status. In this study, the comparison of nutrition status between the elderly women and men showed that the nutritional status of the two sexes had no significant difference (P=0. 192) but women were more at risk than men to be malnourished. Comparison of the nutrition status of married and single elderly showed that although malnutrition is more abundant in the single elderly than in married ones, there was no statistically significant difference between them (P=0/114). Comparison of the nutrition status of the elderly according to their level of education showed a significant relationship between the

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levels of education of sub-diploma and high school diploma (P=0.03). Also the relationship between nutrition status and occupation showed that unemployed and retired people were more malnourished and at risk of malnutrition, which was also statistically significant (P = 0.039). Nutrition in the elderly was not correlated with the complications of diabetes between the patients and non-complicated subjects (P = 0/78) (Table 3).

Table 3: Nutrition status in the elderly studied in terms of the studied variables

Nutritional status	Natural	Exposed to malnutrition	Malnourished	P-Value
Sex	Female	10	61	0.192
	Male	19	51	
Marriage status	Single	10	47	0.928
	Married	19	65	
Education	Illiterate	13	59	0.0389
	Secondary school	19	58	
	High school	3	29	
	Graduate	13	9	
Occupation	Retired or jobless	21	87	0.01
	Occupied	23	25	
Type of living	Independent	1	4	0.898
	With family	26	104	
	Center	2	4	

Discussion

According to the findings of this study, most of the elderly were malnourished, and only a few percent of them had normal nutrition. Masumi and colleagues (2012) conducted a research in Rasht, and found that 87.1% of the elderly had normal nutrition and 12.9% were at risk of malnutrition and 4% had malnutrition [17]. In a study by Aliabadi and his colleagues in Mashhad, 12% of the elderly under study in the city had normal nutrition, 45% were at risk of malnutrition, and 3% were malnourished [11]. Shinji et al., in a similar study in Tokyo, showed that 4% of the elderly were well nourished, 12.6% were malnourished, and none of them was severe in malnutrition [18]. In a study in Kuchma (Kashan), 5.9% of the elderly had malnutrition [19]. Rich and colleagues also reported that 5.5% of the elderly in Pakistan were malnourished and 42.1% were at risk of malnutrition [20]. A study by Alejandro et al. found that 39.1% of people had malnutrition and 21.2% were malnourished. [7]. In an article by Rosa and colleagues on 238 elderly, 90% of the participants were diagnosed with malnutrition [21]. In a review study conducted by Guigoz, the prevalence of malnutrition in elderly people was 0.1%, and the risk of malnutrition was 0.4%. A similar pattern was observed in the elderly and in the elderly care centers [22]. In another study, 20% of people had normal

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nutrition (over 24), 30% were exposed to malnutrition, and 50% were malnourished [23]. A study by Doostan and colleagues in Kerman found that the samples who systematically referred to the diabetes centres and benefited from special treatment programs, including nutrition counselling and nutrition education had normal nutrition. The number of people at risk of malnutrition should be given special attention. This should be given a special attention, as these people are potentially at risk of malnutrition and its consequences [24]. In the present study, we found similar patterns in the intervention and control groups. Those who took advantage of education were less exposed to malnutrition and showed the effect of education on improving the situation. In the intervention group, 22% of the people had normal nutrition (over 24), 29% were malnourished, and 51% had malnutrition.

In a study by Joanna et al. on assessing the nutritional status of elderly people aged over 60 in rural areas using MNA, none of the subjects had malnutrition because nobody scored less than 17 points. About 16% of the elderly women and men exposed to malnutrition. The rest of the group was fed enough. Low energy diet was observed in the whole group (an average of 1312.1 kcal among women and 173.3 kcal in men) [25].

Other results indicated that there was no significant relationship between the nutritional score of the elderly and the age group. In Masoumi et al.'s research in Rasht, there was no significant relationship between age and nutritional status [17]. Also there was no significant relationship between age and nutrition in the study of Doostan and colleagues [24].

The results of the present study indicated no significant relationship between nutrition and gender in the elderly, and females were significantly more malnourished than males. In the research of Masoumi and colleagues, gender relationship with nutritional status was significant in screening, but the relationship between nutrition status and sex in the screening part was not significant [17]. In the study of Doostan and colleagues, women had an inappropriate nutritional status [24].

In the present study, there was no significant relationship between nutrition and marital status in the studied individuals. There was no significant relationship between marital status and nutritional status in Masoumi et al.'s research [17]. In the study of Doostan and colleagues, there was no significant relationship between diet and marital status [24]. While loneliness and social isolation and the consequence of reluctance to food can appear to increase the risk of malnutrition in the elderly, increase the risk of malnutrition, and lead the people at risk to severe

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malnutrition [26]. In the context of nutrition education, the results showed that there was a significant relationship between nutrition and education, and none of the aged people with university education were malnourished, which confirms the findings of Marxi et al. and Masoumi et al. [27].

Getting higher education is related to higher income and livelihood, which leads to better nutrition in the elderly [11]. Also, in the context of the relationship between nutrition status and occupation, unemployed and retired people are more likely to be at increased risk of malnutrition. It seems that having a job and having a chance to participate in social activities have a positive role for people in social protection and improving their status. There is no meaningful relationship between nutrition and lifestyle, which is not in line with the findings of Pasdar and colleagues [28].

Conclusions

People who are at risk of malnutrition should be identified. These people are more likely to reduce caloric intake, which can be easily corrected with nutritional interventions.

According to the findings of this study, in addition to the importance of maintaining and improving the status of diabetic elderly people with a normal nutritional status, special attention should be paid to people suffering from malnutrition. In addition, it is imperative for the government authorities and medical staff to be aware of the problem and its related factors, and to plan for it. Studying the elderly in the country is important because for the purpose of any proper intervention, the collection of basic information from the target group is the most important step. This article is based on the data of a PhD dissertation in Tehran University of Medical Sciences and Health Services.

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