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Research paper

Nutritional status and related risk factors which may lead to functional decline in community-dwelling Turkish elderly

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ABSTRACT

Purpose: The objective of this study is to assess the nutritional status in community-dwelling elderly and to describe risk factors which may cause poor nutrition related functional decline.
Methods: This is a cross-sectional population-based study in urban area where more than one million population lives. Community-dwelling elderly were sampled as 1/100 from this population. Nutritional status was assessed by the Mini Nutritional Assessment (MNA). All demographic characteristics and risk factors which may contribute to functional decline were reviewed. Logistic regression analyses were performed to identify independent risk factors over nutritional status.
Results: A total of 845 elderly were included. Their mean age and standard deviation (SD) of age were 71.6 (5.6) (52% were male). The mean and SD of MNA score was 23 (3.0), of these 42.2% were at risk of malnutrition (MNR) and 3.3% were malnutrition (MN). In logistic regression analysis, odds of low income (OR: 0.5, 95% CI: 0.321–0.849), decreased mid-upper arm circumference (MUAC) (OR: 0.9, 95% CI: 0.873–0.973), decreased waist circumference (WC) (OR: 0.9, 95% CI: 0.970–0.999), increased depressive mood (OR: 0.26, 95% CI0.176: 0.389), diabetes mellitus (OR: 1.7, 95% CI: 1.178–2.601), living alone (OR: 1.9, 95% CI: 1.189–3.150) and increased 4-m walking speed (m/s) (OR: 1.1, 95% CI: 1.05–1.248) were independently associated with possible poor nutrition.
Conclusions: Significant risk factors for poor nutrition can be grouped as clinical conditions; depressive mood and diabetes mellitus, anthropometric measurements; WC and MUAC, social factors; low income and living alone, functionality; increased 4-m walking speed (m/s).

1. Introduction

Ageing is associated with physiological and functional decline and an increased risk of malnutrition [1,2]. Malnutrition is a major geriatric problem associated with functional decline, poor health status and high mortality, and its impact on patients' other clinical outcome has been widely recognized [3]. Studies have shown that approximately 2–8% are malnutrition (MN) and 24–36% are malnutrition risk (MNR) among community-dwelling elderly [4]. The reported prevalence of malnutrition and malnutrition risk in outpatient clinics in Turkey are 13%, 31% (Saka et al), 10.4%, 28.7% for female (Bahat et al.), 3.7%, 23.5% for male (Bahat et al), respectively for MN and MNR [5–7]. In another Turkish study, prevalence of MNR is 28% (Ulger et al.) [8].

Since studies about poor nutrition in Turkish elders are primarily both focused on elders from outpatient clinics and retrospective, we designed a cross-sectional population study. Our primary consideration was reflecting the nutritional status of community-dwelling elders in an urban area. Then, the aims of this present study were developed as, describing risk factors for poor nutrition and detecting its effects of poor nutrition related functional decline and other geriatric syndromes. We consider that our results primarily would contribute to improvement of community-dwelling elders' daily life in urban area.

2. Methods

The Kayseri Elderly Health Study (KEHES) has a cross-sectional population-based design which was conducted between August 2013 and December 2013 and, planned to recruit at least 1% of community-dwelling 89,303 elders in Kayseri urban area. All participants were invited to health centres by their own family physicians, where face-to-face interviews were conducted and physical examinations were performed.

Baseline demographic data including age, sex, marital status, smoking, income and length of education levels were obtained. Nutritional status was assessed by the Turkish version of Mini

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Table 1
Descriptive characteristics of community-dwelling elderly and comparison of their characteristics with nutritional status.

Variables	Poor-nutrition MNA < 23.5 (n = 385)	Well-nutrition MNA ≥ 23.5 (n = 460)	P value
Categorical variables	n (%)	n (%)	
Sex: female	232 (53.2)	205 (46.8)	< 0.001
Smoking: current	119 (58.9)	83 (41.1)	0.038
Fall history	103 (51.2)	98 (48.8)	0.064
Fear of falling	183 (55)	153 (45)	< 0.001
Urinary incontinence	201 (52.3)	183 (47.7)	< 0.001
Cognition impairment	129 (57.8)	94 (42.2)	< 0.001
Depressive mood	152 (71.7)	60 (28.3)	< 0.001
ADL: dependent	5 (100.0)	0 (0.0)	0.014
IADL: dependent	93 (62.4)	56 (37.6)	< 0.001
Education: illiterate	255 (67.0)	197 (33.0)	< 0.001
Marital status: married	220 (38.7)	348 (61.3)	< 0.001
Children: yes	1 (0.2)	1 (0.2)	0.770
Income: low	135 (57.7)	99 (42.3)	< 0.001
Vocation: house wife	219 (53.7)	189 (46.3)	< 0.001
Living alone	74 (62.7)	44 (37.3)	< 0.001
Continuous variables	$\overline{X}$ (SD)	$\overline{X}$ (SD)	
Age (year)	72.5 (5.9)	70.8 (5.3)	< 0.001
Weight (kg)	72.9 (14.5)	79.3 (12.0)	< 0.001
BMI (kg/m^2)	29.8 (5.9)	31.0 (4.6)	< 0.001
Waist circumference (cm)	100.2 (14.0)	105.7 (27.0)	< 0.001
Mid-upper arm circumference (cm)	29.7 (4.1)	31.0 (3.3)	< 0.001
4-m walking speed (s)	1.3 (0.9)	1.08 (0.5)	< 0.001

Nutritional Assessment long form (MNA). This form is developed by Guigoz et al. [9], which is the most established, best validated and widespread nutritional assessment tool used in geriatric population [10]. Based on the total score subjects, MNA scores were classified into three categories: < 17 as MN, 17–23.5 as MNR and ≥ 23.5 as well-nourished.

Functional status was evaluated with the 6-item activities of daily living (ADL) and 8-item instrumental activities of daily living (IADL). The ADL scale is based on six levels of self-performance including bathing or showering, dressing, carrying out personal toileting, moving from bed to chair, bowel or urine continence and eating. The (IADL) scale is based on eight levels of self-performance including the telephone, shopping, cooking, housekeeping, laundry, transportation, ability to take his/her medications and financial management [11].

Geriatric Depression Scale (GDS) [12] and Mini-Mental State Examination (MMSE) [13] scores were obtained to screen depression and cognition respectively. The GDS cut-off point was 14 for Turkish elderly [14] and cognitive impairment was defined as an MMSE score less than 24/30 in the illiterate and 25/30 in the literate respectively [15]. Length of education was assessed according to the last school graduated.

Falls and fear of falling in previous year, current urinary incontinence, length of education, marital status, and the number of siblings were noted. Additionally, self-reported prevalent chronic diseases (e.g. hypertension, diabetes mellitus, coronary heart disease, cerebrovascular disease, renal failure) were noted. Height (cm) and weight (kg) were measured as the subjects wearing light clothing and without shoes. Body mass index (BMI) were calculated from weight and height (kg/m^2). Waist circumference (WC) (cm) was measured at the mid level between the lower rib and the upper edge of the iliac crest during mid expiration with a non-elastic tape. Mid-upper arm circumference (MUAC) was measured at the midpoint between the acromion process and olecranon while the palm was held upward parallel to the floor and then, the arm was freely left aside vertically. Four-meter walking speed was noted during participants' usual gait speed (in m/sec) over a 4-m course.

All participants gave consent; for participants with severe cognitive impairment, consent was obtained from a proxy. The Medical Ethics Committee of Erciyes University Medical Faculty approved the study.

3. Statistical analysis

Comparisons between the well- and poor-nutrition groups were performed by the Chi^2 test (categorical variables) and the independent sample t test (continuous variables). Univariate and multiple binary logistic regression analyses were conducted to evaluate the associations of well- and poor-nutrition according to participants' characteristics. The P values < 0.05 were considered statistically significant.

4. Results

We included 845 community-dwelling elderly whose mean age and standard deviation (SD) was 71.6 (5.6) years, of which 46.8% were females and 53.2% were males. Participant characteristics are summarized in Table 1. The poor nutritional status was defined as a combination of MN and MNR. A total of 54.4% of them were well-nourished (MNA ≥ 23.5), 45.5% were poor-nourished (42.2% MNR and 3.3% MN). The mean age was a significant indicator of poor- or well-nourished (72.5 (5.9) for poor and 70.8 (5.3) for well-nourished) (P < 0.001). In comparison of the well- and poorly-nourished, the poorly-nourished were more likely to be functionally dependent, had fear of falling, and more frequent urinary incontinence (Table 1). Additionally, the poorly nourished had more cognitive impairment and were more depressive than the well-nourished. Living alone, being housewife, short educational length and low income was found to be a risk factors for poor nutrition in univariate analysis.

Weight, BMI, WC, MUAC were all high in well-nourished but four-meter walking speed were low in the well-nourished when compared with the poor-nourished. The prevalence of chronic diseases according to nutritional status is shown in Table 2. Elderly with diabetes mellitus were poor-nourished.

In logistic regression analysis, gender, age, weight, BMI, WC, MUAC, 4-m walking speed, fear of falling, urinary incontinence, cognition impairment, depression, IADL, education, marital status,