Archives of Gerontology and Geriatrics xxx (2015) xxx–xxx

Contents lists available at ScienceDirect

Archives of Gerontology and Geriatrics

journal homepage: www.elsevier.com/locate/archger

Nutritional status and dietary intake of institutionalized elderly in Turkey: A cross-sectional, multi-center, country representative study

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ARTICLE INFO

Article history:
Received 14 August 2014
Received in revised form 7 May 2015
Accepted 8 May 2015
Available online xxx

Keywords:
Elderly
Residential homes
Nutritional status
Food consumption
Turkey

ABSTRACT

Objective: To evaluate the nutritional status and dietary intake of institutionalized elderly in Turkey.
Design: Cross-sectional study. Setting: 25 institutions in 19 cities throughout Turkey. Participants: Elderly residents aged 65 years and older ($n = 554$).
Measurements: Nutritional status using Mini Nutritional Assessment (MNA), food consumption with 24-h dietary recall and anthropometric measurements (body weight, height, body mass index (BMI), waist circumference (WC), hip circumference, waist/hip ratio, mid-upper arm circumference (MUAC)).
Results: The mean age of the elderly was 76.1 ± 7.3 years. BMI of elderly men and women were found to be 26.59 ± 4.58 kg/m^2 and 30.07 ± 6.32 kg/m^2, respectively. WC of elderly men and women were found to be 98.90 ± 1.33 cm and 100.62 ± 1.34 cm, respectively. Most of the elderly were overweight based on BMI and at risk of metabolic diseases based on WC. According to MNA, 44.2% had normal nutritional status, 49.1% were at risk of malnutrition, 6.7% had malnutrition. All nutrients intake was favorable according to requirements, except for calcium and magnesium. Energy, protein, carbohydrate, fat, vitamins A, E, B1, B2, B6, C folat, iron, zinc intake of elderly who had normal nutritional status, who were at risk of malnutrition and malnourished were significantly different. Energy and nutrients intake of elderly who had normal nutritional status was found to be better than the others.
Conclusion: Nutritional status should be periodically screened in the institutionalized elderly to prevent malnutrition. Also, it was noted that adequate energy and nutrients intake of the elderly played a crucial role in maintaining nutritional status and preventing malnutrition within residential homes.

1. Introduction

The elderly population in Turkey is increasing rapidly like all over the world. The proportion of the elderly population is 7.7% based on 2013-Turkish Statistical Institute, while it was 5.9% in 1998 and 7.0% in 2003 (Turkish Statistical Institute Census Results, 2013). It is expected to be 10.2% by 2023 (Kumtepe, Özgüney, Samyeli, & Şendur, 2013). This increase in the elderly population has resulted in an increase in the number of elderly people who need help and social support. Residential and nursing homes are the primary institutions which provide support in terms of shelter, nutrition, care and social needs in Turkey. Currently, governmental and private institutions are hosting 19.893 elderly in Turkey (Kumtepe, Özgüney, Samyeli & Şendur, 2013). Elderly people, who have faced nutritional care problems while living in the community with family or alone, may be malnourished or at risk of malnutrition during the admission to those institutions. Also, due to not applying food services according to the needs of elderly and having high percentage of leftovers (20–70%), elderly residents consume inadequate nutrients and have a low quality diet. This may cause elderly person whose nutritional intake is dependent on institutional food service, come across with malnutrition (Simon, 2002; Vikstedt, Suominen, Joki, et al., 2011). Therefore, nursing and residential homes are where the highest rates of malnutrition and/or its risk are reported (Cankurtaran, Saka, Şahin, et al., 2013; Guigoz, 2006; Labossiere & Bernard, 2008; Pereira Machado & Santa Cruz Coelho, 2011; Şanlıer & Yabancı, 2006). Guigoz (Guigoz, 2006) found 5–71% of malnutrition among 6821 elderly persons after a review of 32 studies, and reported that malnutrition risk was higher in nursing homes. Malnutrition has been reported as 21% in elderly residents while 65% were at risk of malnutrition according to Mini Nutritional Assessment (MNA) (Vikstedt et al., 2011). A study conducted in Turkish elders has revealed that the

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http://dx.doi.org/10.1016/j.archger.2015.05.004
0167-4943/

majority with malnutrition risk were those who lived in nursing homes according to MNA (Şanlıer & Yabancı, 2006).

Recent studies suggest that malnutrition and/or its risk, one of main problems in the institutionalized elderly, are influenced by nutritional care in the residential homes. It has been shown that dietary factors significantly influence the nutritional status of the elderly (Cuervo, Ansorena, Garcia, Astiasaran, & Martinez, 2008). Food consumption was different between elderly with malnutrition and at risk of malnutrition (Cuervo et al., 2008). A study has pointed out that food diversity decreases the risk of malnutrition (Niedzwiedzka & Wadolowska, 2010). The relationship between nutrients intake and nutritional status was also reported among malnourished elderly who consumed inadequate micronutrients (Öztürk Arikbuka, Yücecan, & Karaağaoğlu, 2013). Malnutrition in residents was again associated with eating half or less of food served in nursing homes (Papparotto, Bidoli, & Palese, 2013). Food consumption appears to affect the nutritional status of the institutionalized elderly. Therefore, the present study was conducted to investigate the nutritional status and dietary intake of elderly subjects residing in 25 institutions in Turkey.

2. Materials and methods

2.1. Setting and sampling

This study was conducted in 25 institutions of Ministry of Family and Social Policies in 19 cities between November 2011 and July 2012. Institutions were chosen with stratified sampling based on cities settled in 12 NUTS 1 (The Nomenclature of Territorial Units for Statistics) regions among 99 governmental residential homes (universe) in Turkey. Accordingly, cities and regions where institutions were visited were as follows; ''İstanbul'' from İstanbul region, ''Kocaeli'', ''Bilecik'' from East Marmara region, ''Kırklareli'', ''Balıkesir'' from West-Marmara region, ''İzmir'', ''Aydın'', ''Denizli'', ''Manisa'' from Egean region, ''Ankara'' from West-Anatolia region, ''Nevşehir'', ''Yozgat'' from Middle-Anatolia region, ''Antalya'', ''Mersin'' from Mediatereanean region, ''Zonguldak'' from West-Blacksea region, ''Ordu'' from East-Blacksea region, ''Erzincan'' from Northeastern-Anatolia region, ''Malatya'' from Middle-East Anatolia region, ''Gaziantep'' from Southeastern-Anatolia region.

Sample size was calculated based on malnutrition ratio (21%) found with MNA in elderly in Vikstedt et al.'s (2011) study. It was determined as 441 ($N = 2350$, $p = 0.21$, $\alpha = 0.05$, $\beta = 0.20$, $d = 0.07$; $n = 441$). The study was completed with 554 voluntary residents aged 65 years and older, without psychiatric disorders, dementia and who were not bedridden and had been living in the institution for at least 3 months or more.

2.2. Nutritional status of the elderly

The socio-demographic data of the elderly were collected via face-to-face questionnaire. Nutritional screening was performed with MNA (Guigoz, Vellas, & Garry, 1994). Body weight, height, waist circumference (WC), hip circumference, mid-upper arm circumference (MUAC) and calf circumference were measured by the researchers according to proper methods (Lee & Nieman, 2003). Body mass index (BMI; kg/m^2) and waist/hip ratio were calculated. MUAC was evaluated with ''Anthropometric Reference Data for Children and Adults'' (McDowell, Fryar, Ogden, Flegal, 2008).

2.3. Energy and nutrients intake of the elderly

Food consumption was assessed by 24-h recall method, maintained for 1 day. The dietary recalls were performed by face-to-face interviews, in assessing the participant's food and beverage intakes for the previous day. The amount of foods and beverages were determined by using ''household measures'' and ''mL'' or ''grams'' based on ''Portion Sizes for Age Groups Guideline'' of the Ministry. Also, a photographic atlas was used to determine the food portion sizes (Rakıcıoğlu, Tek Acar, Ayaz, & Pekcan, 2009). To estimate the amounts of food in one portion consumed outside the institutions, standard dishes description was used (Merdol Kutluay, 2003). Mean energy, macronutrient and food intakes of the elderly by sex and age groups were calculated using BEBIS 7 software, which was also double entered to ensure verification (Ebispro for Windows, Germany; Turkish version/BeBiS 7). Results were compared with Turkish Recommended Daily Allowances (RDA) according to age and gender (Dietary Guidelines for Turkey, 2006). Nutrient intake below two-thirds of the RDA (67%) was considered low (Jelliffe & Jelliffe, 1989).

2.4. Ethical issues

Ethical approval was obtained from Hacettepe University Ethics Committee with B.30.2.HAC.0.70.01.00/431-3488 number on 20.10.2011 and institutional permission was taken from the Ministry of Family and Social Policies. The elderly provided written informed consent, in accordance with the Declaration of Helsinki.

2.5. Statistical methods

Data were analysed with SPSS version 20.0 using number (n), percentage (%), mean ($\bar{X}$), standard deviation ($\pm$SD), median values. Normal distribution of data was checked with Shapiro–Wilk test. Groups were compared with one-way analysis of variance (ANOVA) for normal distributed or Kruskal–Wallis test for not normally distributed variables. Tukey HSD analysis was performed for multiple comparisons of groups after ANOVA and pairwise comparisons were performed after Kruskal–Wallis test. Chi-square test (χ^2) was used in comparison of qualitative variables between groups. Fisher's chi-square result was excepted when expected numbers are small. $p < 0.05$ was set as statistically significant.

3. Results

The mean age of elderly was 76.1 $\pm$ 7.3 years and the proportion of male and female were 64.6% and 35.4%, respectively. They had been living in institutions for 46.1 $\pm$ 44.9 months. 31.0% were illiterate while the elderly with the same ratio were primary school graduates. The ratio of housewives (22.0%) and retired workers (22.2%) were the highest ratios. 83.6% of the elderly had at least one diagnosed disease. The most prevalent were hypertension (60.3%), cardio vascular diseases (CVD) (34.3%), rheumatic diseases (29.8%) and diabetes mellitus (DM) (29.4%) (Table 1).

3.1. Nutritional status

The BMI of elderly men and women were 26.59 $\pm$ 4.58 kg/m^2 and 30.07 $\pm$ 6.32 kg/m^2, respectively. The WC of elderly men and women were 98.90 $\pm$ 1.33 cm and 100.62 $\pm$ 1.34 cm, respectively. Waist/hip ratio was 0.98 $\pm$ 0.08 in men and 0.91 $\pm$ 0.08 in women. Most of men and women were overweight based on BMI (44.4% and 32.1%, respectively) ($p < 0.001$), at risk of metabolic diseases based on WC (64.0% and 91.8%, respectively) ($p < 0.001$) and abdominally obese based on waist/hip ratio (85.5% and 93.4%, respectively) ($p < 0.05$) (Table 2). Among totally 358 men, MUAC of 41.9% ($n = 150$) was under 5th percentile, of 15.6% ($n = 56$) was between 5th and 10th percentile and of 11.2% ($n = 40$) was between 10th and 15th percentile. Among totally 196 women, MUAC of 22.4% ($n = 44$) was between 25th and 50th percentile, of 16.8% ($n = 33$) was under 5th

Please cite this article in press as: Ongan, D., Rakıcıoğlu, N., Nutritional status and dietary intake of institutionalized elderly in Turkey: A cross-sectional, multi-center, country representative study. Arch. Gerontol. Geriatr. (2015), http://dx.doi.org/10.1016/j.archger.2015.05.004