LIVING SITUATIONS ASSOCIATED WITH POOR DIETARY INTAKE AMONG HEALTHY JAPANESE ELDERLY: THE OHASAMA STUDY

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Abstract: Background: Rapid increases in life expectancy have led to concurrent increases in the number of elderly people living alone or those forced to change living situations. Previous studies have found that poor dietary intake was common in elderly people living alone. However, there have been few studies about the dietary intake in elderly people living in other situations, particularly those living with family other than a spouse (nonspouse family), which is common in Japan. Objective: To examine the differences in dietary intake by different living situations in elderly Japanese people. We analyzed the data of 1542 healthy residents in the town of Ohasama aged 60 years and over who had completed self-administered questionnaires. Methods: The dietary intake was measured using a validated 141-item food frequency questionnaire. Multiple regression models with robust (White-corrected) standard errors were individually fitted for nutrients and foods by living situation. Results: In men, although the presence of other family was correlated with significantly lower intake of protein-related foods, e.g., legumes, fish and shellfish, and dairy products, these declines were more serious in men living with nonspouse family. Conversely, in men living alone the intake of fruits and vegetables was significantly lower. In women, lower intakes of fruit and protein-related foods were significantly more common in participants living with nonspouse family than those living with only a spouse. Conclusion: These findings revealed that elderly people living alone as well as those living with family other than a spouse had poor dietary intake, suggesting that strategies to improve food choices and skills for food preparation could promote of healthy eating in elderly Japanese people.

Key words: Living alone, living with family other than a spouse (nonspouse family), gender difference, dietary intake, elderly, Japanese.

Introduction

A noticeable rise in the number of elderly people living alone or living with family other than a spouse (nonspouse family) has been observed in Japan with the rapidly increasing life expectancy of the Japanese population (1). Concurrently, there has been a noticeable increase in elderly people who have been forced to change living situations. According to the Ministry of Health, Labor and Welfare, the percentage of elderly people aged 65 years or over and living alone increased from 10.1% in 1986 to 16.1% in 2012, and the percentage of elderly people living with nonspouse family increased from 17.6% in 1986 to 26.4% in 2012 (2). Because the living situations of elderly people reflect socio-demographics, lifestyle, and cultural characteristics, changes in their living situations are a dynamic aspect of life for an older person.

The effects of various living situations, particularly with elderly people who live alone, on survival and health outcomes have been identified in industrialized countries (3-6). Generally, elderly people who live alone are particularly vulnerable to poverty, social isolation, diminished psychological well-being, and adverse health conditions. But reports on risks of the dietary intake of older adults who live alone have been inconsistent. Some studies have suggested that living alone, eating alone, and social isolation had a negative influence on dietary intake (7-10), whereas other studies have not found this association (11, 12). These differences between living situations and risks for poor dietary intake from one country to another could be influenced by different social, environmental, and cultural characteristics in these countries.

Furthermore, previous studies have primarily focused on identifying the lifestyle and dietary risks cited for elderly people living alone; data for these risks for elderly people living in other situations were sparse. There have been no comprehensive studies about the relationship of dietary intake with different living situations in the nondisabled elderly in Japan. Identifying characteristics that may contribute to poor dietary intake is important to prevent future deterioration in the activity of daily living [ADL] (13, 14) and early death.

The aim of this study was to identify the risks of poor dietary intake associated with different living situations among healthy elderly people in the Japanese population. We investigated if there were differences in dietary intake among the living situations, and if so, we clarified the characteristic differences
Material and methods

The present study was based on longitudinal observation of individuals who had been participating in a survey on cardiovascular diseases in Ohasama, Iwate Prefecture, Japan. The geographic and demographic characteristics of the study participants have been described previously (15, 16).

This study was approved by the Institutional Review Board of Tohoku University School of Medicine and by the Department of Health of the Hanamaki (Ohasama) Municipal Government. Participants were informed of the potential risks and benefits of the study and provided their written consent to participate.

Participants for the present study

The total population aged 60 years or over in this town was 2,614 in 1998. Of this total, 2,348 participants (response rate 89.8%) participated in the study period from February 1–March 28, 1998. Overall, 604 individuals were excluded for the following reasons: incomplete answers to the questionnaire (n = 250) or not being fully independent of physical function in basic ADL (<1 point for the 6-item physical function measurement of the Medical Outcomes Study short-form General Health Survey) (n = 354) (17). Finally, data from 1,542 participants (1,121 households; 42.1% men; mean age, 69.4 and 69.7 years for men and women, respectively) were analyzed.

Living situations

The participants were asked two questions. The first question was “Do you currently have a spouse?” This question had three possible responses as follows: yes, no (bereaved or divorced), no (unmarried). The second question was “Do you live with someone?”. This question had five responses as follows: living with son’s (or daughter’s) family, living next to their son’s (or daughter’s) family, living with their son or daughter, living with a spouse only, and living alone. On the basis of these responses, we classified the subjects as “living with a spouse only,” “living with a spouse and other family,” “living without their spouse but with other family (i.e., nonspouse family),” and “living alone” (Figure 1).

Dietary characteristics

A standardized methodology was used to calculate the consumption of nutrients and foods from the data obtained using a Japanese version of a 141-item food-frequency questionnaire [FFQ]. The reproducibility and validity of this questionnaire has been previously reported in detail (18). The FFQ asked about the average frequency of consumption of each food during the previous year. The nine frequency categories ranged from no consumption to seven or more times per day. A standard portion size of one serving was specified for each food, and respondents were asked if their usual portion was larger (>1.5 times), the same, or smaller (<0.5) than the standard. In the present study, alcoholic beverages were not considered. Nutritional supplements also were not taken into account because there were few supplement users in the respondents.

Figure 1

Study participants in each living situation in the present analysis of the Ohasama study, Japan, 1998–2005

In this study, energy, protein, vitamins and minerals (vitamin A, vitamin B1, niacin, vitamin B6, vitamin B12, vitamin C, calcium, magnesium, and zinc), and 15 food groups (rice, potatoes, sugar, legumes, nuts, vegetables, fruits, mushrooms, seaweeds, fish and shellfish, meats, eggs, dairy products, edible fat, and confections) were examined. All nutrient and food intakes were adjusted for total energy intake using the density method, i.e., unit/1000 kcal energy intake.

Demographic, social, and lifestyle characteristics

Educational attainment was categorized into “high school education or less (<10 years)” or “more than high school education (≥10 years).” Smoking habits were defined as “never,” “ex-smoker,” or “current smoker.” Alcohol consumption was defined as “never,” “ex-drinker,” or “current drinker.” The frequency of vigorous and mild leisure-time physical activity was also categorized according to the questions, “How many times do you normally perform vigorous leisure-time physical activity per week, e.g., tennis and jogging?” and “How many times do you normally undertake mild leisure-time physical activity per week, such as walking?” The responses were divided into three groups by the frequency of each exercise: “rarely or never (<1 hour/week),” “1 or 2 hour(s)/week,” or “≥3 hours/week.” Sleep duration was classified as “short (<7 hours/day),” “≥7 and <9 hours/day,” or “long (≥9 hours/day).” Self-reported body weight and height were used to calculate body mass index [BMI], which were stratified as underweight (<18.5 kg/m²), normal weight