Female, live in urban, and the existence of a caregiver increased risk over-nutrition in elderly: an Indonesian national study 2010

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Abstrak

Latar belakang: *Kelebihan nutrisi dapat mengakibatkan masalah kesehatan pada lansia. Hal ini memerlukan upaya pencegahan dengan mengetahui penyebabnya. Penelitian ini untuk mengidentifikasi beberapa faktor dominan yang berkaitan dengan kelebihan nutrisi.*

Metode: *Data merupakan sebagian penelitian potong lintang dari sebagian data Riset Kesehatan Dasar (Riskesdas) 2010.Subjek terdiri dari 16 142 orang berumur 60 tahun atau lebih yang berasal dari 266 510 rumah tangga. Data yang dikumpulkan antara lain data sosio-demografi . Status gizi ditentukan dengan indeks massa tubuh (IMT) dengan kategori normal (18.5-24.9 kg/m^2) dan nutrisi berlebih (25kg/m^2 atau lebih). Asupan nutrisi berdasarkan wawancara asupan makanan selama 24 jam terakhir. Untuk mengidentifikasi faktor risiko kelebihan nutrisi dipergunakan perhitungan risiko relatif.*

Hasil: *Kelebihan nutrisi sebanyak 3184 (19,7%) subjek dan yang normal 12 958 (80,3%). Dibandingkan dengan lelaki, perempuan berisiko 56% lebih banyak menderita kelebihan nutrisi [risiko relatif (RRa) = 1,56;95% interval kepercayaan (CI) = 1.44;1,69]. Subjek yang berdomisili di perkotaan dibanding pedesaan berisiko 30% lebih tinggi menderita nutrisi berlebih (RRa = 1,30; 95% CI = 1,24;1,35). Sedangkan subjek yang mempunyai pendamping/pembantu mempunyai risiko kenaikan 26% menderita Kelebihan nutrisi (RRa = 1,26; 95% CI = 1,16;1,40).*

Kesimpulan: *Subjek yang mempunyai pendamping/pembantu, perempuan, dan yang bedomisili di perkotaan berisiko lebih menderita kelebihan nutrisi. Oleh karena itu diperlukan pendidikan kesehatan kepada lansia dan pendamping/pembantunya tentang gizi seimbang. (**Health Science Indones 2012;1:9-14**)*

Kata kunci: *lansia, nutrisi berlebih, pen damping*

Abstract

Background: Over-nutrition could leads health problems in the elderly which requires control efforts. Knowing the risk factors of over-nutrition is necessary to overcome the over-nutrition related health problems. This study aimed to identify the determinant factors of over-nutrition in the elderly.

Methods: The study used a cross-sectional study as a part of Basic Health Research (Riskesdas) 2010. The subjects consisted of 16 142 respondents aged 60 years or older with normal nutritional status and over-nutrition that derived from 26 6510 household members. Riskesdas data on sociodemographic was collected by questionnaire. Nutritional status was measured using body mass index (BMI). BMI was categorized into normal (18.5-24.9) and over-nutrition (25 or over). Nutrition intake was obtained from 24 hour food recall. Over-nutritional risk factors identified by relative risks.

Results: This analysis noted 3 184 (19.7%) subjects were over-nutrition and 12 958 (80.3%) were normal. Female than male 56% more risk to be over-nutrition [adjusted relative risk (RRa) = 1.56; 95% confidence interval (CI) = 1.44;1.69]. Living in urban than rural area 30% more risk to be over-nutrition(RRa = 1.30; 95% CI = 1.24;1.35). While the presence of caregiver 26% increased to be over-nutrition in elderly (RRa = 1.26; 95% CI = 1.16;1.40).

Conclusion: The presence of a caregiver, woman, and living in urban area increased risk to be over-nutrition in elderly. Health education is needed for the elderly family and caregiver to enhance their knowledge on providing balanced nutrition to control over-nutrition. (**Health Science Indones 2012;1:9-14**)

Key words: elderly, nutrition, obesity, presence of a companion

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Aging population is an issue for the developing and developed countries. In Indonesia, approximately 50.5 million people or 21.7% of population is older age group (> 45 years).[1] In the next mid-century (2050) total population of Indonesia will be 284.6 million, with >24% aging population.[2] Several studies have shown that nutritional problems in elderly is largely due to over-nutrition including overweight and obesity, which lead to various degenerative diseases such as coronary heart disease, hypertension, diabetes mellitus, gallstones, arthritis, kidney disease and cancer.[3] In addition, obesity in the elderly also trigger the musculoskeletal disorder.[4] Obesity in the elderly is a major factor in losing of independency[5] and reduced ability of the limbs to perform physical activity that increases the tendency to become disabled.[4] Study of disability on 77 501 elderly in Indonesia showed 19,1% of elderly with over-nutrition status become disabled.[3] Obese on elderly can be a burden to other family members and decline their productivity especially for those who are in employment age. Based on Fontaine et al.[6] less BMI (<17 to 19) resulting in fewer 1-9 years of age and high BMI (> 35) associated with a reduction in the age of 9-13 years. Malnutrition, either under-nutrition or over-nutrition, at the age of 70 years can increase mortality.[5]

Over-nutritional status is due to unbalance of amount of energy intake (consumption) and energy expenditure (physical activity). Weight gain in elderly also triggered by lesser activity.[4] In contrast, losing appetite and sense of taste can also affect the consumption on the elderly. Changes both physiologically and biologically causes decreased metabolism and physical capacity.

Other factors such as gender and area of residence also affect person's health status. In many countries, including Indonesia, the prevalence of obese women is higher than male and also related to other socio-economic conditions.[7]. Branca[9] showed that cases of obesity in some developed countries were higher in female than male group. Other longitudinal study showed that women who are overweight tend to those who are not married, low educated and low income.[10] In Indonesia, based on the socio-demographic characteristics, obesity tend to be higher on those who lived in urban area, were well educated, and had high economic status.[7]

Controlling over nutrition in the elderly is important to prevent health problems related to obesity by knowing the risk factors. This study aimed to identify determinant of over-nutrition in the elderly.

METHODS

This study used a cross-sectional study as part of Basic Health Research (Riskesdas) data, 2010. Samples derived from 33 provinces and 441 districts/cities in Indonesia. Probability proportional to size was applied to get the census block (CB) target of 2800 CB. Purposive sampling was used in every census block to obtain sample at the household level (25 households) per census block. The data consisted of 2 798 BS, with 69 300 households, and 266 510 household members. The population in this study was all elderly in Indonesia over 60 years old, according to the definition of elderly in the Welfare of the Elderly Act No.13 year 1998.[11] Available data of socio-demography, and anthropometry were 21 380 samples, and 21 094 samples respectively. To strengthen the findings, the data analysis limited to the group of normal weight and the group of over-nutrition status (overweight and obesity), yet the underweight respondents were excluded. Therefore, the study consisted of 16 142 samples. The dependent variable in this study is nutritional status (normal weight, and over-nutrition). The independent variable in this study consisted of socio-demographic factors (gender, marital status, occupation, economic status, area of   residence village /city, and the presence of a caregiver) and nutrient intake (protein intake, fat intake, carbohydrate intake, energy intake). Measurement of height and weight of the respondents were conducted by trained enumerators.

Body weight was measured on digital scales with 0.1 kg precision and height was measured using a microtoise with precision of 0.1 cm. Nutritional status was calculated based on body mass index (BMI) by calculating the weight in kilograms divided by height in meters squared. Data on socio-demographic were obtained through interviews using a questionnaire. Food consumption data were obtained through 24-hour food recall.

In this study, over-nutrition was defined as overweight and obesity with the category according to WHO criteria. Normal nutritional status is respondent within BMI 18.5-24.9 kg/m^2, and   over-nutritional status was referred to the respondent who had BMI 25kg/m^2 or more. Categories of food intake was defined based on the recommended dietary allowance (RDA) of elderly (+60) introduced by Ministry of Health. Recommended fat intake is 15-25% of total energy,

carbohydrate intake is 50-60% of total energy, protein intake is 80-100% RDA, and energy consumption is 70-100% RDA.

Analyses were performed by using SPSS version 13. Independent variables associated with over-nutrition in the bivariate analysis with p value of < 0.25 were candidate risk factors included to calculate the adjusted relative risks. To obtain the determinant factor of over-nutrition in the elderly and the adjusted relative risks the Cox regression analysis with stepwise forward method was performed at the significance level p <0.05.

RESULTS

Total number of Riskesdas sample with complete data on normal and over-nutrition were 16142 samples, of which 12958 (80.3%) were elderly with normal nutritional status and 3184 (19.7%) elderly with over-nutrition.

Table 1 presents the result of bivariate analysis of socio-demographic and nutrient intake with the over-nutrition status on the elderly. Over-nutrition on elderly women was higher than men. Employment history as an entrepreneur had more opportunity to get over-nutrition. Most of the elderly nutrient intakes were less likely than RDA.

Table 1. Several sociodemographic, consumption factors and the risk of over-nutrition on elderly

	Nutritional status				Crude relative risk	95% confidence interval	P
	Normal (n=12958)		Over-nutrition (n=3184)				
	n	%	n	%			
Marital status			2313	19.8			
Married	9374	80.2	871	19.6	1.00	Reference	
Not married	3584	80.4			0.99	0.91-1.07	0.759
Employment history			1289	21.4			
Unemployed	4726	78.6	122	36.9	1.00	Reference	
Private/government employee	209	63.1	550	29.2	1.71	1.43-2.07	0.003
Entrepreneur	1333	70.8	831	12.6	1.36	1.23-1.51	0.033
Farmer/fisherman/laborer	5756	87.4	392	29.6	0.59	0.54-0.64	0.855
Others	934	70.4			1.38	1.23-1.54	0.000
Level of expenditure			420	11.0			
Lowest	3413	89.0	501	14.8	1.00	Reference	
Second	2878	85.2	610	19.0	1.33	1.19-1.54	0.000
Middle	2600	81.0	789	25.6	1.75	1.53-1.96	0.000
Fourth	2297	74.4	864	32.8	2.38	2.07-2.62	0.000
Highest	1770	67.2			2.99	2.66-3.36	0.000
Fat consumption			1538	17.9			
<15% TE	7074	82.1	816	20.7	1.00	Reference	
15-25% TE	3120	79.3	830	23.1	0.89	0.81-0.99	0.000
>25% TE	2764	76.9			0.77	0.71-0.84	0.000
Carbohydrate consumption			2002	19.6			
<50% TE	8218	80.4	390	21.2	1.00	Reference	
50-60% TE	1449	78.8	792	19.4	1.09	0.97-1.23	0.821
>60% TE	3291	80.6			1.01	0.93-1.10	0.151
Protein consumption			1780	18.2			
<80% RDA	7999	81.8	494	20.6	1.00	Reference	
80-100% RDA	1903	79.4	910	22.9	0.90	0.80-1.00	0.000
>100% RDA	3056	77.1			0.79	0.73-0.86	0.015
Energy consumption			1902	18.9			
<70% RDA	8172	81.1	550	21.6	1.00	Reference	
70-100% RDA	2000	78.4	732	20.8	1.03	0.93-1.16	0.025
>100% RDA	2786	79.2			0.91	0.83-0.99	0.006

Our final model (Table 2) shows that gender, employment history, economic status, area of residence, and the presence of a caregiver associated to nutritional status in the elderly.

Table 2. Relationship between socioeconomic groups and risk of over-nutrition in elderly

	Nutritional status				Adjusted relative risk	95% confidence interval	P
	Normal (n=12958)		Over-nutrition (n=3184)				
	n		%				
Gender							
Male	6268	84.0	1194	16.0	1.00	Reference	
Female	6690	77.1	1990	22.9	1.56	1.44-1.69	0.000
Residence							
Rural	5543	73.6	1988	26.4	1.00	Reference	
Urban	7415	86.1	1196	13.9	1.30	1.24-1.35	0.000
Live with caregiver							
No	10392	79.5	2686	20.5	1.00	Reference	
Yes	2566	83.7	498	16.3	1.26	1.14-1.40	0.000

*Adjusted each other between variables in this table, protein consumption, marital status, employment history, and level of expenditure

Elderly women than men had 56% more than one and half time risk of over-nutrition [adjusted relative risk (RRa) = 1.56, 95% confidence interval (CI) = 1.44-1.69)]. As well as those who were living in urban areas had 30% greater risk of a tendency to be in over-nutrition than the elderly living in rural area (RR = 1.30, 95% CI = 1.24; 1.35). The presence of a caregiver increased the risk of over-nutrition in the elderly (RRa = 1.26; 95% CI = 1.16-1.40). In addition, the higher the social status was the riskier to be in over-nutrition.

DISCUSSION

This study was a further analysis of 2010 Riskesdas data, so that the analysis conducted in this study was limited to the existing variables in the Riskedas questionnaire. Riskesdas did not perform measurements of physical activity as one of the factors that can influence nutritional status. However, Riskesdas was the largest community-based health survey in Indonesia with the most enable data collection instruments. Riskesdas also maintains the validity of the data which making it possible to generate the health status in Indonesia.

This study found that gender, marital status, employment history, economic status, area of residence in the village/town, and the presence of a caregiver affected the over-nutrition of the elderly. The food intake variable had relatively small effect on the elderly.

The analysis of gender and nutritional status suggested that elderly women had higher risk of obesity. In 2007, national prevalence of obesity in adults men was lower, 16.3%, than females (26.9%).[7] The results were consistent with the Huang's study[13] which showed that the prevalence of obesity in the elderly in Taiwan was higher (36.8%) in women compared with men 29.0% (BMI > 25 kg/m2). This study's results also consistent with Suzana's study where obesity in elderly women in Malaysia was two-fold (13.8%) than men (7.4%).[14]

There were several physiological reasons why women are more obese than men. First, it could be caused by the composition of the female body that has more fat than muscle. Women's body content fat about 6-11% more than men.[15] Women also have a high estrogen hormone so that the body tends to store and retain fat. Puberty and early pregnancy increases levels of estrogen that can increase fat reserves in preparation for fertilization, fetal development and lactation.[15] The women also slow in metabolism. However, this is contrary to a study's result that compared with men, women spend money for food or snacks less than men.[16] In fact, eating out or snacking can increase the risk of obesity.

Elderly who live in urban had 30% higher risk to be in over nutritional status than those who live in rural. People living in urban areas will be fatter.[14,17] This study's result was consistent with the study on the elderly in Malaysia that showed those living in urban areas will tend to be in over-nutritional status than those who live in rural areas.[14]

The results of cross tabulation between urban villages and fat consumption showed that the number of elderly in urban areas that consume more fat than normal recommendations is higher than those who live in rural areas. This can be caused by social factors and the condition of remote areas, limited access of transportation, limited food vendors that sale high-calorie food.[16] Purchasing power also differ between rural and urban communities. People who live in urban area have lower purchasing power than those who live in urban communities.

These results indicated that the higher the socioeconomic level per capita, the higher the prevalence of obesity. This was consistent with a study on the elderly in Malaysia that showed over-nutrition was more common in elderly with higher income.[14]

Other study conducted in developing countries showed the same pattern.[18] It was inversely related to trend in developed countries. In developed countries, lower socioeconomic groups would be more at risk for the occurrence of over nutrition. This is because social factors influence the access to food, and in certain populations, nutritional insecurity will have a significant effect on the election of food.[9] In addition, education and knowledge have an influence on obesity, those who are least educated have the highest prevalence.[14]

The analysis of relation between the existence of a caregiver and over-nutrition in the elderly showed that elderly who lived with a family companion, increases the risk of obesity. This was consistent with the theory that food distribution to parents, children and grandfather affecting the diet as a factor to the personal nutritional status.[9] Ledikwe's study showed that the elderly who live alone, the amount of energy and protein consumption will be lower, especially in elderly women.[16] Furthermore, the elderly who live alone will affect not only the quantity but also quality of food that they consumed.[17] The elderly who have a family companion as a caregiver maybe get more attention on food intake than the elderly who live without a caregiver. Another factor was the concern of caregiver if elderly do not receive sufficient and tasty food, would worsen their health status. So that the intake may be excessive when in addition to the reduced physical activity and the decreased of metabolism.

In Indonesia, family is the main resource for taking care of the elderly, either economic or cultural reasons. Indonesian society put a high value the tradition that family have role and responsibility in taking care of parents as figures that should be respected.[20] That fact makes the elderly live in shadow of over-nutrition. For example, in the Minangkabau family, ideally from the socio cultural perspective, the social security for the elderly is in the form of concentric circles which children as the center as a primary responsibility. If there are no children in the family then the responsibility lies with the family of mother, and next family of the tribe, and so on.[21]

In conclusion, female, living in urban areas, and the presence of a caregiver may increase the risk of over-nutrition in the elderly. Therefore, it is important to be controlled to prevent health problems related to obesity.

Acknowledgments

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