Nutritional status of Mongolian elderly

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ABSTRACT

Background. Treatment costs may be decreased by nutritional assessment. This study aimed to determine the nutritional status of Mongolian elderly.

Methods. This was a cross-sectional study. The nutritional status of Mongolian elderly was evaluated using the Mini Nutritional Assessment test, Activities of Daily Living questionnaire, and Instrumental Activities of Daily Living questionnaire.

Results. Of the 392 men and 815 women (mean age, 68.1 years), 4.8% were malnourished, 26.2% were at risk of malnutrition, and 69% were well-nourished. In terms of body mass index, 4 in 5 of the elderly had values ≥21 kg/m^2. Those with body mass index of ≥23 kg/m^2 did not differ in terms of gender (62.8% in men and 63.4% in women). 74.9% had a mid upper arm circumference of ≥23 cm. The calf circumference did not differ between genders.

Conclusion. 31% of Mongolian elderly were at risk of malnutrition or malnourished. The malnutrition rate increased with age. Malnutrition correlated to activities of daily living and instrumental activities of daily living.

Key words: Activities of daily living; Aged; Body mass index; Malnutrition

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INTRODUCTION

Nutritional status of the elderly reveals multiple aspects of health and social issues. Being either overweight or underweight is associated with loss of activities of daily living. The risk of malnutrition is higher in older persons than those in middle age.[1] Early detection may reduce their health care costs.[2] We therefore assessed the nutritional status of the elderly in relation to their activities of daily living.

METHODS

This was a cross-sectional study. One cluster from each economic-geographical region of Mongolia was randomly selected. 392 retired men aged ≥60 years (mean±standard deviation [SD], 68.9±6.5 years) and 815 retired women aged ≥55 years (mean±SD, 65.7±8.5 years) were included.[3] Their nutritional status was evaluated via face-to-face interview using the Mini Nutritional Assessment test,[4] Activities of Daily Living (ADL) questionnaire,[5] and Instrumental ADL questionnaire.[6] Those with a nutritional score of ≤17 were considered malnourished, and those with scores of 17 to 23.5 were considered at risk of malnutrition, and those scoring ≥24 were deemed not malnourished.

RESULTS

175 (14.5%) of the participants were from the western region, 183 (15.2%) from the eastern region, 192 (15.9%) from the mountainous region, 183 (15.2%) from the Gobi region, and 473 (39.2%) from the central region.

58 (4.8%) of the participants were malnourished, 316 (26.2%) were at risk of malnutrition, and 833 (69%) were well-nourished. The highest nutritional scores were in the age-groups of 60 to 64 years (mean score, 25.3) and of 55 to 59 years (mean score, 24.9). The mean score for those aged ≥85 years was 21. Scores between genders were not significantly different (**FIGURE 1**). Four in 5 of the participants had a body mass index (BMI) of ≥21 kg/m². Those with a BMI of ≥23 kg/m² did not differ in terms of gender (62.8% in men vs 63.4% in women).

74.9% had a mid-upper arm circumference of ≥23 cm. The calf circumference did not differ between genders. Nutritional status correlated to the BMI (r=0.4, p<0.0001), the mid-upper arm circumference (r=0.4, p<0.0001), and the calf circumference (**TABLE 1**). Malnutrition correlated to depression, monthly income, ADL, and instrumental ADL. Being at risk of malnutrition correlated to mental and behavioural disorders, ADL, and instrumental ADL (**TABLE 2**). The mean nutritional score of the participants was 24.4 (range, 10-30); it was 24.2±3.6 in the western region, 25±3.9 in the eastern region, 23.4±3.2 in the mountainous region, 23.7±3.1 in the Gobi region, and 24.9±3.1 in the central region (**FIGURE 2**).

14.4% of the participants had slight malnutrition, 1.5% had severe loss of appetite, 9% had weight loss during the past 3 months, and 22.8% suffered
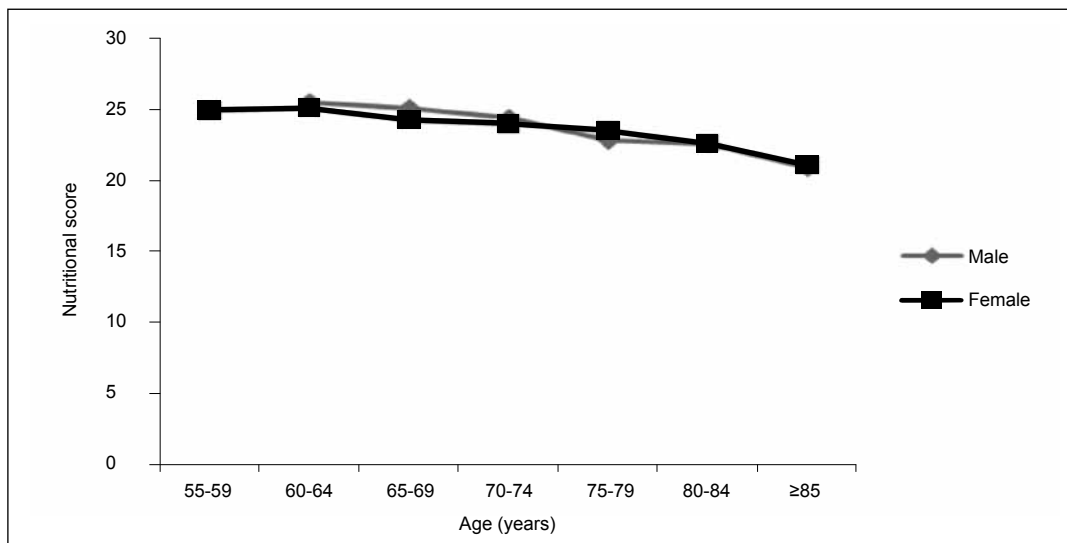

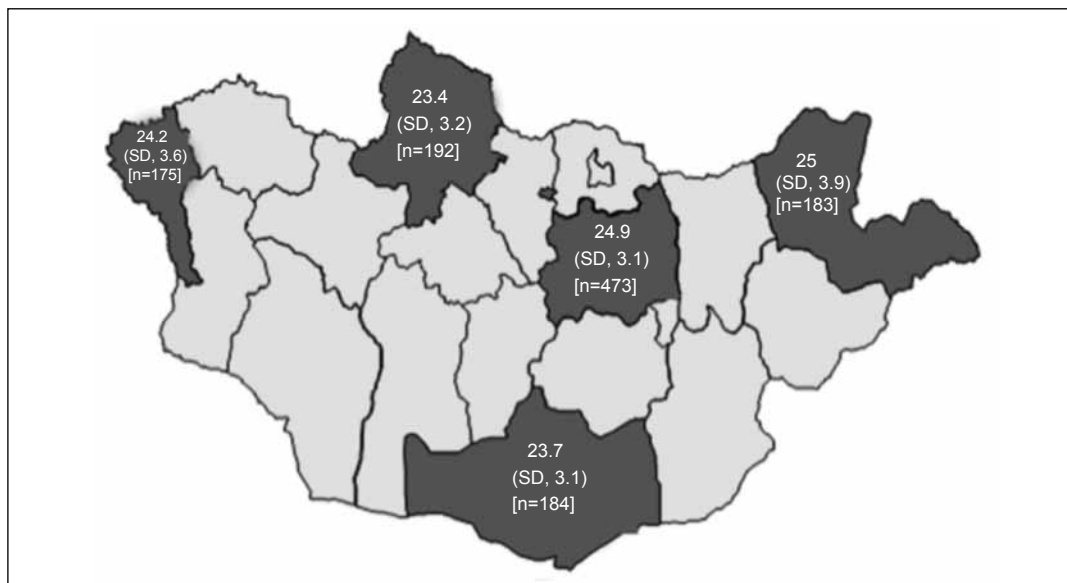**FIGURE 1. Nutritional status of Mongolian elderly by gender**

FIGURE 2. Nutritional status of Mongolian elderly by regions

TABLE 1
Anthropometric indicators of nutritional status of elderly

Anthropometric indicators	No. (%) of participants (n=1207)		
	Total	Male	Female
Body mass index (kg/m^2)			
<19	71 (5.9)	17 (4.3)	54 (6.6)
19-20	126 (10.4)	43 (11)	83 (10.2)
21-22	247 (20.5)	86 (21.9)	161 (19.8)
≥23	763 (63.2)	246 (62.8)	517 (63.4)
Mid-upper arm circumference (cm)			
<21	87 (7.2)	22 (5.6)	65 (8)
21-22	216 (17.9)	59 (15.1)	157 (19.3)
≥23	904 (74.9)	311 (79.3)	593 (72.8)
Calf circumference (cm)			
<31	451 (37.4)	132 (33.7)	319 (39.1)
≥31	756 (62.6)	260 (66.3)	496 (60.9)

TABLE 2
Correlation between nutritional status and demographics

Indicators	Malnutrition		At risk of malnutrition		Normal	
	r	p Value	r	p Value	r	p Value
Depression	0.2	<0.0001	0.2	<0.0001	-0.3	<0.0001
Cognitive ability	0.3	<0.0001	0.2	0.0001	0.3	<0.0001
Gender	-	0.0005	-	0.4	-	0.6
Monthly income	-	0.0003	-	0.03	0.1	<0.0001
Education	0.2	0.0001	0.2	0.0001	0.2	<0.0001

from mental stress and acute illnesses. 33.3% of those who had severe loss of appetite suffered from mental stress and acute illnesses in the past 3 months. The BMI of 5.9% of the participants was <19 kg/m^2, of 10.4% was 19-20 kg/m^2, of 20.5% was 21-22 kg/m^2, and of 63% was ≥23 kg/m^2. 15.7% of the participants were taking ≥3 medications, 84.8% had one serving of milk and yoghurt a day, 96.1% had meat and/or meat products daily, 70% had ≥2 servings of fruit and/or vegetables daily, and 80% had ≥5 glasses of fluid per day. 20% of those who were malnourished did not know that they were malnourished, whereas 2.4% did know.

7.2% of the participants had a mid-upper arm circumference of <21 cm, of whom 46% were at risk of malnutrition and 21.8% were malnourished. 37.4% % of the participants had a calf circumference of <31 cm, of whom 9.1% were malnourished.

Of the participants who had 3 meals daily, 81.5% had 1 unit of milk and/or yoghurt, 31.9% had ≥2 units of legumes and/or eggs, 96.6% had meat and/or meat products, and 84.9% had ≥5 glasses of fluids. Nonetheless, only 9.9% of the participants had 3 meals daily, the remaining 90.1% had 1 or 2 meals daily. 2.8% of the participants were not self-feeding and 52.9% of whom tended to be malnourished.

According to instrumental ADL assessment, among those who were malnourished, 56.9% were completely dependent in cooking, 58.6% in shopping, 67.2% in phone use, and 63.8% in doing housework (**TABLE 3**). Among those who were at risk of malnutrition, 11.7% were completely dependent in handling money, 15.8% in shopping, 21.5% in phone use, and 16.1% in doing housework. With regard to ADL assessment, among those with

TABLE 3
Nutritional status, activities of daily living (ADL), and instrumenal ADL of the Mongolian elderly

Variables	Malnutrition (n=58)		At risk of malnutrional (n=316)		Normal (n=833)		Statistics
	No.	%	No.	%	No.	%	
Insrumental ADL							
Meal preparation							
Independence	13	22.4	210	66.5	703	84.4	p<0.0001
Some dependence	12	20.7	62	19.6	101	12.1	χ^2=232.5
Complete dependence	33	56.9	44	13.9	29	3.5	F=80.7
Walking outside							
Independence	12	20.7	217	68.7	716	86	p<0.0001
Some dependence	15	25.9	64	20.3	90	10.8	χ^2=239
Complete dependence	31	53.4	35	11.1	28	3.2	F=91.4
Shopping							
Independence	13	22.4	197	62.3	685	82.2	p<0.0001
Some dependence	11	19	69	21.8	119	14.3	χ^2=237.5
Complete dependence	34	58.6	50	15.8	29	3.5	F=74.1
Phone use							
Independence	9	15.5	156	49.4	639	76.7	p<0.0001
Some dependence	10	17.2	92	29.1	137	16.4	χ^2=233.7
Complete dependence	39	67.2	68	21.5	57	6.8	F=83.7
Self-medicating							
Independence	15	25.9	196	62	706	84.8	p<0.0001
Some dependence	24	41.4	105	33.2	112	13.4	χ^2=223.1
Complete dependence	19	32.8	15	4.7	15	1.8	F=85.3
Housework							
Independence	11	19	174	55.1	633	76	p<0.0001
Some dependence	10	17.2	91	28.8	164	19.7	χ^2=246.5
Complete dependence	37	63.8	51	16.1	36	4.3	F=61.8
Handling money							
Independence	9	15.5	208	65.8	713	85.6	p<0.0001
Some dependence	15	25.9	71	22.5	95	11.4	χ^2=283.5
Complete dependence	34	58.6	37	11.7	25	3	F=106.2
ADL							
Bathing							
Independence	11	19	227	71.8	743	89.2	p<0.0001
Some dependence	19	32.8	59	18.7	77	9.2	χ^2=282.9
Complete dependence	28	48.3	30	9.5	13	1.6	F=172.3
Dressing							
Independence	20	34.5	259	82	782	93.9	p<0.0001
Some dependence	15	25.9	41	13	44	5.3	χ^2=278.6
Complete dependence	23	39.7	16	5.1	7	0.8	F=164.9
Grooming							
Independence	20	34.5	261	82.6	794	95.3	p<0.0001
Some dependence	15	25.9	38	12	32	3.8	χ^2=289.1
Complete dependence	23	39.7	17	5.4	7	0.8	F=179.2
Toileting							
Independence	26	44.8	275	87	801	96.2	p<0.0001
Some dependence	13	22.4	24	7.6	28	3.4	χ^2=232.9
Complete dependence	19	32.8	17	5.4	4	0.5	F=142
Transferring							
Independence	20	34.5	251	79.4	785	94.2	p<0.0001
Some dependence	19	32.8	51	16.1	42	5	χ^2=266
Complete dependence	19	32.8	14	4.4	6	0.7	F=157.4
Walking							
Independence	21	36.2	236	74.7	749	89.9	p<0.0001
Some dependence	17	29.3	66	20.9	79	9.5	χ^2=250
Complete dependence	20	34.5	14	4.4	5	0.6	F=122.7
Eating							
Independence	20	34.5	238	75.3	757	90.9	p<0.0001
Some dependence	18	31	62	19.6	69	8.3	χ^2=240.4
Complete dependence	20	34.5	16	5.1	7	0.8	F=128.6

malnutrition, 48.3% were completely dependent in bathing, 39.7% in dressing and grooming, 32.8% in toileting and transferring, and 34.5% in walking and eating. Most participants who were malnourished or at risk of malnutrition were completely dependent with regard to phone use (among instrumental ADL) and bathing (among ADL).

DISCUSSION

In our study, 4.8% of Mongolian elderly were malnourished and 26.2% were at risk of malnutrition, and 69% were well-nourished. In Bangladeshi elderly, 26% were malnourished and 62% were at risk of malnutrition, and 12% were well-nourished.[7] In Hispanic elderly, 4.3% were malnourished and 25.4% were at risk of malnutrition.[2] In a Brazilian study,[8] undernutrition was associated with the loss of ADL.

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