

**Dietary Habits and Nutritional Status of the Elderly  
in Insein Township, Yangon Region in 2013**

*Lwin Lwin Aye<sup>1\*</sup>, Htin Linn<sup>1</sup>, Moh Moh Hlaing<sup>2</sup> & Aye Mya Aung<sup>3</sup>*

<sup>1</sup>Department of Public Health

<sup>2</sup>Department of Medical Research

<sup>3</sup>University of Public Health

The community-based, cross-sectional descriptive study aimed to assess the dietary habits and nutritional status of elderly was conducted among 60 to 75 years old elderly in five selected wards of Insein Township, Yangon Region from October to November 2013. Data were collected by using semi-structured questionnaires and Mini-Nutritional Assessment Short Form (MNA-SF), tool to assess the nutritional status of the elderly people including anthropometric measurements of weights and heights or calf circumferences. Out of 153 respondents, 54.2% were well-nourished, 7.2% malnourished, and 38.6% at risk of malnutrition according to MNA-SF. Among 153 respondents, 143 were available for measurements of weight and height to calculate BMI. Majority of respondents (44.76%) were within normal BMI range followed by overweight (26.6%), underweight (18.88%) and obese (9.8%). Dietary habits of the elderly people were asked using food frequency questionnaires (FFQ). Although 66% of the elderly people ate vegetables daily, only 24.8% and 13.7% of the elderly people consumed fruits and milk daily. About one-third (33.3%) of the elderly people were suffering from chewing difficulties either a little or severe. Although age groups, main meal taken per day and chewing difficulties of the elderly people were not associated with their nutritional status, sex and education status were associated with nutritional status of the elderly people in this study. In conclusion, health care providers need to aware of nutritional problem of elderly and it scopes for further screening, monitoring and supporting for better nutritional status.

*Key words:* Elderly, Dietary habits, Nutritional status, MNA-SF, Anthropometric measurements, FFQ

**INTRODUCTION**

Along with increasing elderly people population in developing countries including Myanmar, there is a corresponding shift in disease patterns with an increase in non-communicable diseases (NCDs) that particularly affect older people.<sup>1</sup>

Nutritional problems of elderly whether under-nutrition or nutrition-related chronic diseases such as cardiovascular disease, diabetes, osteoporosis and cancer are mainly due to dietary inadequacies and malnutrition is becoming increasingly more common among elderly population.<sup>2</sup> Despite the rapidly increasing proportion of older

persons in the population, current health system particularly in low- and middle-income countries including Myanmar are poorly designed to get information concerning this group's specific nutritional needs and to meet the chronic care needs arising from complex burden of non-communicable diseases. So, these countries are likely to face enormous burden including socio-economic burden for elderly people with chronic non-communicable diseases in near future if there were no planned prevention and intervention

---

\*To whom correspondence should be addressed.

Tel: +95-943180164

E-mail: llwinaye@googlemail.com

programs for healthy and active ageing and good nutrition care for elderly. In Myanmar, elderly population above the age of 60 years is estimated about 2.14% of population in the year 1980-1981 and become 8.8% in 2010-2011.<sup>3</sup> Making dietary inquiry can provide basic information concerning dietary habits and eating problems of elderly for further interventions. This study reported the dietary habits and nutritional status of the elderly, and relationship between nutritional status and associated factors in elderly population in Insein Township.

## MATERIALS AND METHODS

A community-based, cross-sectional descriptive study was conducted from September to November 2013 in Yangon Region. Firstly, Insein Township was purposively selected as study area because there was Geriatric Clinic at Insein General Hospital. Secondly, wards were selected. List of twenty-one wards was used as the sampling frame. Identification numbers were given to each ward. Among them, five wards were selected randomly. Then, households with elderly individuals aged 60-75 years were listed and sample size for each ward was calculated to get proportionate numbers of sample of total elderly in each ward. Serial identification number was given to each household in each ward. Next, sampling interval was calculated, and starting number of household was selected randomly.

The sample size was calculated using the formula:

$$n = z(1-a) pq/d,$$

The input criteria for sample size estimation  
 $z=1.96$  (95% confidence interval),

$p$ =estimated prevalence of undernutrition in elderly in community,<sup>4</sup>

$q=(1-p)=0.9$ ,  $d=0.02$  (margin of error),

The required smallest sample size=153,

Non-respondent rate set at 10%

Persons within age range of 60-75 years with good orientation to the interview were included in the study and persons aged

beyond this age range, those who had bad orientation to the interview, bedridden persons, persons with generalized swelling of whole body or swelling of one or more limbs, persons who did not have all four limbs and visitors who came to selected wards one week prior to data collection time were excluded.

Face-to-face interviews were conducted using pre-tested semi-structured questionnaires to assess background characteristics and dietary habits of respondents. Nutritional status was accessed by Mini Nutritional Assessment Short Form (MNA-SF) of Nestle Nutrition Institute.<sup>5</sup> Because of important changes in body composition in elderly, assessment of nutritional status using anthropometry alone cannot reveal nutritional status of elderly. Worldwide, MNA-SF is the most validated and referenced nutrition screening and assessment tool for people over 65 years.<sup>1</sup> It includes six questions with defined scores: i.e.,

- Reduced food intake over past three months (score 0-2),
- Weight loss during last three months (score 0-3),
- Mobility (score 0-2),
- Psychological stress or acute disease in past three months (score 0 and 2),
- Neuropsychological problem (score 0-2) &
- BMI (score 0-3) to identify older people at risk of malnutrition without the need for more invasive tests such as blood sampling.<sup>6</sup>

It also includes an option to substitute calf circumference (score 0 and 3) when BMI is not available. Chosen points of scores for all six questions are summed to assess the nutritional status. Total scores of 12 points and above indicates a good nutritional status whereas a score of 8 to 11 points indicates the condition of at risk of malnutrition, and points less than 7 indicates the malnourishment in the elders.<sup>5</sup>

Although MNA-SF is a special tool to detect the nutritional status of the elderly,

it could not know the fact that which elderly people were underweight, normal, overweight or obese. Therefore, after excluding the elderly with kyphoscoliosis, weights and heights of 143 respondents were measured and their BMI were calculated. For BMI, weight was measured in kilograms (kg) to nearest one decimal point by using bathroom scale, wearing light clothes without foot wears and height was measured in centimeters (cm) up to the nearest one decimal point by using the height measuring tape as the respondent rested erect against vertical wall.

Body Mass Index (BMI) was calculated by weight in kilogram divided by height in meter square. BMI was classified into four scores for MNA-SF (2009 version), 0=BMI<19, 1=BMI 19-<21, 2=BMI 21-<23, 3=BMI≥23 or greater. BMI was also classified as underweight (BMI<18.5), normal range (BMI 18.5-24.99), overweight (BMI 25-29.9) and obese (BMI≥30) according to WHO international BMI classification of adults.<sup>7</sup> If BMI is not available, calf circumference was measured with non-stretched type of tape at largest part of calf muscle in centimeter, usually about 4 inches from knees. Data entry and analysis were done with SPSS 16.0 after checking and validation. Relationship between nutritional status and background factors were calculated by chi-square test. Statistical significance was set at p value <0.05.

#### *Ethical consideration*

Approval was obtained from Research and Ethical Committee, University of Public Health, Yangon. The written informed consent for participation in the study was obtained.

## **RESULTS**

#### *Background characteristics of respondents*

In this study, majorities of the respondents were Bamar (83%) followed by Kayin (14.4%), Indian (2%) and others (0.7%). Majority of respondents were Buddhist

(82.4%) followed by Christian (14.4%) and, Islam and Hindu (3.3%). The mean age was 67.69±4.52 years which ranged from 60 to 75 years. Age group with highest percentage was 65-70 years (39.9%) followed by 71-75 years (31.4%) and 60-64 years (28.8%). Female preponderance was found among respondents (98 females vs. 55 males). More than half of respondents (54.2%) had attained middle school level and above followed by primary level completed (26.1%), read and write only (13.1%) and, illiterate (6.5%). Most of the respondents (57.5%) were married.

Majority of respondents (91.5%) lived with family members and (8.5%) lived alone. Approximately half of respondents were dependent (53.6%), followed by retired persons (34.6%), and currently working persons (11.8%). Regarding income, 40.5% earned >100,000 kyats, 26.15% had 50,000-100,000 kyats and 33.3% got <50,000 kyats per month, respectively, and source of income were their current works, pension salaries and financial supports from family members, relatives and friends.

#### *Behavioral risk factors*

At the time of study, 23.6%, 20% and 1.8% of male respondents had the habits of betel quit chewing, smoking and drinking alcohol, respectively and, 25.1% and 3.1% of female respondents chewed betel quit and smoked, respectively.

#### *Dietary habits*

Regarding main meal, majority of respondents (82.4%) ate 3 times/day followed by 2 times/day (14.4%), 4 times/day (2.6%) and one time per day (0.7%). For breakfast, 57.5% ate rice/fried rice together with curries/boiled garden pea and 32.7% ate Moak-hin-khar/ Onhno-kwak-swal/ A-thote/ Noodle soup, with or without coffee/tea and 5.9% drank tea alone. Majority of respondents (56.9%) ate snack for 1-2 times/day followed by 4 times/day (6.5%) and 36.6% had no habit of eating snack. About one-

fourth of respondent (25.5%) ate biscuits/bread/cake/Chinese snacks with or without coffee/tea, 17.6% ate fruits and 9.2% drank tea alone as snack. Majority of respondents (75.2%) were used to drink green tea during or after meal.

Table 1. Frequency distribution of eating habits of various food (days per week)

Food	Never n(%)	Seldom n(%)	Sometimes n(%)	Often n(%)	Daily n(%)
Meat	9(5.9)	17(11.1)	39(25.5)	35(22.9)	53(34.6)
Fish	2(1.3)	23(15)	43(28.1)	47(30.7)	38(24.8)
Pulses	4(2.6)	38(24.8)	56(36.6)	22(14.4)	33(21.6)
Eggs	6(3.9)	40(26.1)	59(38.6)	26(17)	22(14.4)
Vegetables	0(0.0)	17(11.1)	20(13.1)	15(9.8)	101(66)
Fruits	3(2.0)	53(34.6)	26(17.0)	33(21.6)	38(24.8)
Milk/milk products	27(17.6)	72(47.1)	23(15.0)	10(6.5)	21(13.7)
Coffee/tea	25(16.3)	25(16.3)	9(5.9)	7(4.6)	87(56.9)
Cold drink	36(23.5)	81(52.9)	26(17.0)	3(2.0)	7(4.6)

Seldom=<1 day/week, Sometimes=1-3 days/week  
Often=4-6 days/week

Table 2. Frequency distribution of reasons for avoiding food and types of reduced intake

Reasons*	Type of food (Reduced intake/avoided)	Frequency n(%)
Tradition	Beef, pork	57(37.3)
Religious prohibition	All meat, all fish, beef, pork	9(5.9)
Abdominal bloating or loose motion after eating	Pulses, eggs, vegetables	6(3.9)
Believe as food causing neck stiffness ( <i>Tet-sar</i> )	Beef, pork, milk, hilsa fish, acacia leaf, djonkol bean, bamboo shoot, pumpkin	20(13.1)
Believe as cold food ( <i>A-aye-sar</i> )	Pork, duck, duck eggs, butter catfish, roselle leaf, cucumber	19(12.4)
Financial difficulties	Meats, milk, fruits, cold/soft drinks	13(8.5)
Hypertension	Salty food	35(22.9)
Diabetes	Rice, rice and wheat products, sweet food and fruits	13(8.5)
High blood lipid level	Fatty food	22(14.4)
Chewing difficulties	Meats, vegetables, fruits	8(5.2)

\*The elderly answered more than one response.

Eating habits of elderly for various foods (days per week) in one month prior to the survey was asked by using FFQ. Although majority of respondents (66%) ate

vegetables 56.9% drank coffee/tea and 34.6% ate meat daily, they ate pulses and eggs sometimes, and fruits, milk/milk products and cold drink seldom (Table 1). Majority of respondents (84.3%) avoided food as they disliked (54.2%) or other reasons (45.8%) (Table 2).

Some respondents (30.7%) were reducing or avoiding salty, fatty foods and 76.6% of these respondents did it due to their current diseases. Out of 153 respondents, 47.1% had non-communicable diseases (Table 2). Nearly one-third of respondents (33.3%) reported that they had chewing difficulties and reasons for it (Table 2).

Table 3. Frequency distribution of the nutritional status according to MNA-SF (n=153) and BMI (n=143) by sex

Nutritional status	Sex	
	Male n(%)	Female n(%)
<i>According to MNA-SF (n=153)</i>		
Normal	26(47.3)	57(58.2)
At risk of malnutrition	27(49.1)	32(32.7)
Malnourished	2(3.6)	9(9.2)
<i>According to BMI (n=143)</i>		
Underweight (BMI<18.5)	13(25.0)	14(15.4)
Normal (BMI 18.5-24.99)	27 (51.9)	37(40.7)
Overweight (BMI 25-29.9)	9(17.3)	29(31.9)
Obese (BMI ≥30)	3(5.8)	11(12.09)

### Nutritional status

According to MNA-SF, 7.2% and 38.6% of respondents were malnourished and at risk of malnutrition, respectively. Nutritional status by sex is shown in Table 3.

Among 153 respondents, body weights and heights of 143 respondents were measured. According to BMI, 18.88% of respondents were underweight. Among females, 31.87% and 12.09% were overweight and obese, respectively (Table 3).

Only calf circumference of 10 respondents was measured due to kyphoscoliosis and inability to stand up and 7 respondents had <31cm and 3 respondents had >31cm equivalent to MNA-SF calf circumference score 0 and 1, respectively (Table 3).

Table 4. Relationship between nutritional status according to BMI and associated factors (n=143)

Factors	Nutritional status n(%)			Total	χ <sup>2</sup> (p value)
	Under weight	Normal weight	Over weight obesity		
<i>Age (years)</i>					
60-64	10(22.7)	12(27.3)	22(50)	44	8.548 (0.07)
65-70	9(15.5)	32(55.2)	17(29.3)	58	
71-75	8(19.5)	20(48.8)	13(31.7)	41	
<i>Sex</i>					
Male	13(25)	27(51.9)	12(23.1)	52	6.525 (0.038)*
Female	14(15.4)	37(40.7)	40(44)	91	
<i>Education status</i>					
Illiterate-Primary school	12(17.6)	31(45.6)	25(36.8)	68	3.45 (0.048)*
Middle-high school	5(17.9)	16(57.1)	7(20)	28	
University graduate	10(21.3)	17(36.2)	20(42.6)	47	
<i>Main meal per day(times/day)</i>					
1-2	8(34.8)	9(39.1)	6(26.1)	23	4.66 (0.097)
3-4	19(15.8)	55(45.8)	46(38.3)	120	
<i>Chewing difficulties</i>					
No	19(19.6)	38(39.2)	40(41.2)	97	4.147 (0.126)
Yes	8(17.4)	26(56.5)	12(26.1)	46	

\*Statistically significant

#### *Relationship between nutritional status and associated factors*

There were significant associations between nutritional status and sex ( $p < 0.05$ ), and education status ( $p < 0.05$ ). Although no association was seen, more overweight elders in 60-64 years than other age groups, more underweight in one main meal eaters, and higher percentage of overweight and obesity (41.2%) in elderly without chewing difficulties than those with it (26.15%) were found (Table 4).

## DISCUSSION

In this study, dietary habits of the elderly were more or less different with different reasons. The modified food pyramid for elderly people indicates water, bread, fortified cereal, rice and pasta group should provide core of diet, vegetables and fruits were most plentiful, dairy products, meat, eggs, poultry, fish, and nut were in moderation, fats, oils and sweets should be consumed sparingly. In addition, calcium,

vitamin D, vitamin B12 supplements are also needed.<sup>8</sup> In the study, although some elderly skipped one or two main meals per day, majority ate the staple food (i.e., rice) and curries including vegetables for 3 times per day. But the elderly reported that they ate milk and milk products and fruits rarely because they disliked milk and could not afford to buy fruits.

Similar findings were also reported in a study of Indonesia.<sup>9</sup> In this study, majority of elderly perceived that cows and buffaloes are working partners of farmers so that they avoided beef. Financial constraints also remained as main reason to buy meat and vitamins. One noticeable point in the study was majority of the elderly (75.2%) was taking green tea during or immediately after meal because they did not know the consumption pattern of green tea can impair iron absorption. Drinking tea alone in breakfast or as snack might be harmful in long term. Moreover, unhealthy habits like smoking and chewing betel quit was found among both sexes of elderly.

In the study, according to MNA-SF, 38.3%, 7.2% and 54.2% of the elderly were at risk of malnutrition, malnourished and normal nutrition status, respectively. Percentage of malnourished in this study was lower than findings from a study in Iran where malnourished (12%), at risk of malnutrition (45.3%) and well-nourished (42.7%) were found.<sup>10</sup> In this study, percentage of at risk of malnutrition was higher in males than females whereas females had higher percentage of malnourished than males. These findings coincided with those from the study of Iran.<sup>10</sup>

In this study, overall overweight percentage (36%) was higher than underweight (19%) and reverse findings were reported in the study of Indonesia.<sup>9</sup> In this study, females had higher percentages of overweight and obesity than males. Similar finding was reported by the study of Malaysia<sup>11</sup> which pointed out that female elderly were more at NCD risks. In this study, males had more underweight percentage than females.

Many studies reported that underweight in elderly was associated with higher risk of disability.<sup>12</sup>

In this study, nearly half of elderly had NCDs and they were reducing or avoiding some food and taking medicines to control their disease conditions. In fact, prevalence of hypertension and diabetes might be higher than that of findings as they may be co-morbid and remained undiagnosed in those overweight and obese elderly in this study population. Prevalence of chewing difficulties was similar to reported chewing difficulties prevalence of 30% from a study in UK.<sup>13</sup>

In present study, although no significant association was found between nutritional status and age groups, the youngest age group (60-64 years) was more underweight than other age group and it was differ from finding of increasing malnourishment with increasing age in the study in Turkey.<sup>14</sup>

In this study, association between nutritional status and education status was found. A study in Singapore revealed that the elderly were more likely to be at nutrition risk when they were less educated.<sup>15</sup>

Although there was no association between nutritional status and main meal per day, underweight was more prevalent in elderly people who took main meal two times or one time per day (34.8%) than those who took three times or four times per day.

In this study, although nearly quarter of respondents reported they had chewing difficulties, no association was found between these difficulties and nutritional status and which may be due to over response of 'Yes' to question of 'Chewing difficulty'. But higher percentage of overweight and obese people was seen among the elderly without chewing difficulties than those with chewing difficulties.

As this study was done only on small sample size, findings may not represent the dietary habits and nutritional status of entire population in Myanmar. This study

describes the dietary habits only and exact dietary intake of elderly people could not be determined. Nutritional status of the elderly people also depends on amount of nutritious food intake, physical activity and social support but these data could not be identified in this study. There may be possibilities of recall bias for some variables regarding their dietary habits and questionnaires in Mini Nutritional Assessment.

### *Conclusion*

Nearly 7% of elderly were malnourished and approximately one-third were at risk of malnutrition. They also had unhealthy behaviors and dietary habits like smoking, betel quit chewing, drinking green tea during and after meal, drinking tea alone as snack and avoiding milk and fruits. Most of them consumed limited items of food by considering financial hardships. They were at risk of malnutrition in later life because loosening and missing of teeth would be worsening with increasing ages.

Approximately half of elderly in this study were suffered from NCDs. Some of them were at risk of NCDs due to overweight, obesity and underweight. Therefore, elderly persons should be regarded as targeted group to give special attention including health promotion efforts to improve the diet for healthy ageing, to access to health services, to provide financial and material supports, and to create safe and supportive environment for those people.

### **REFERENCES**

1. Mary M, Carmel D, Thomas PR & Fritsch P. The harmonised training package (HTP): Resource material for training on nutrition in emergencies, *Help Age International* 2013.
2. WHO. Nutrition for older persons. Available from: URL: <http://www.who.int/nutrition/topics/ageing/en/index.html>, Accessed 1 October 2013.
3. Ministry of Health. Health in Myanmar, The Republic of the Union of Myanmar, 2013.
4. Furman EF. Under nutrition in older adults across the continuum of care. *Journal of Gerontological Nursing* 2006; 32: 22-7.

5. Nestle Nutrition Institute. Development and validation of the MNA®. Available from: URL: [http://www.mna-elderly.com/site\\_map.html](http://www.mna-elderly.com/site_map.html) Accessed 10 December 2013.
6. Abellan VKG & Vellas B. Is the mini-nutritional assessment an appropriate tool to assess frailty in older adults? *The Journal of Nutrition, Health and Aging* 2011; 15(3): 159-61.
7. WHO. Global database on body mass index: BMI classification. Available from: URL: [http://apps.who.int/bmi/index.jsp?IntroPage=intro\\_3.html](http://apps.who.int/bmi/index.jsp?IntroPage=intro_3.html) Accessed 5 October 2013.
8. Russell RM, Helen R & Alice HL. Modified food guide pyramid for people over seventy years of age. *The Journal of Nutrition* 1999; 129: 751-3.
9. Boedhi-Darmojo MR. Trends in dietary habits of the elderly: The Indonesian case 2002. Available from: URL: <http://www.onlinelibrary.wiley.com> Accessed 8 October 2013.
10. Aliabadi M, Kimigar M, Ghayour mobar-han M, Shakeri M, Llaty A, Moosavi A, *et al.* Prevalance of malnutrition in free living elderly in Iran. *Asia Pacific Journal of Clinical Nutrition* 2008; 17: 285-9.
11. Roanash MY, Mohd RH & Sharifah Norazizan SAR. Anthropometry dimensions of older Malaysians: Comparison of age, gender and ethnicity. *Asian Social Science Journal* 2009; 5.
12. Population Reference Bureau. Today's Research on Aging, 2007.
13. Holmes B & Roberts C. The influence of social and physical factors and out-of-home eating on food consumption and nutrient intake in the materially deprived older UK population: Final report to the WRVS, National Centre for Social Research, King's College, London, 2009.
14. Bulent S, Kaya O, Bahat Ozturk G, Erten N & Karan MA. Malnutrition in the elderly and its relationship with other geriatric syndromes, Istanbul, Turkey, 2009.
15. Yap KB & Niti M. Nutrition screening among community-dwelling older adults in Singapore. *Singapore Medical Journal* 2007; 48: 911-916.