

# Nutritional Assessment and Socio-Demographic Status of Geriatric Population Residing in Bhaktapur Municipality-A Community Based Cross-Sectional Study

Srijana Duwal\*, Alok Shrestha, Pradeep Kaji Poudel, Ganga P. Kharel

<sup>1</sup>GoldenGate International College

\*Corresponding author: duwal.siru@gmail.com

## Abstract

The elderly remains among the most deprived in the country for several reasons, like issues with access to facilities and widespread health care needs. The cultural norms and traditional family support systems for elderly in Nepal is changing which have placed significant pressure in caring elderly people which shows an urgent need to identify and to highlight the problems the elderly people are facing, in order to bring the improvement in the quality of living. Thus, the study was conducted to assess the nutritional status, health and lifestyle of elderly aged 90 and above. Community based cross-sectional and descriptive study was carried out in Bhaktapur municipality. Semi-structured questionnaire and anthropometric measurements were used to collect information on nutritional status, socio-economic characteristics, anthropometric parameters, health and lifestyle of the elderly. The results of the study revealed that 62.8% of the total participants were at the risk of malnutrition although, most of the participants had small but frequent meals, 80% had meals at least five times a day comprising two side meals and three main meals. Despite of the age, 22.9% of the elderly lived an active life and 71.4% lived a moderate lifestyle. The results also showed that the eating pattern of long-lived elderly was characterized by regularity, simplicity and no overeating. Taken together, the report revealed that customized nutritional management and education should be developed and provided in order to improve the quality of healthy living for the elderly.

**Keywords:** geriatric, nutrition, lifestyle

## Background

In Nepal, individuals over 60 years of age are considered elderly (SCA, 2006). The elderly population of Nepal has increased from 1.5 million in 2001 to 2.2 million in 2011 (CBS, 2012). As well as the life expectancy of Nepalese people is also increasing. A comparison of elderly population growth rate and size with the national population suggests that both have been rising for the past decades (Shrestha, 2013). Age of senior citizens can be categorized into two groups; (a) Active life, the productive age i.e., recognized up to 75 and (b) Care life, 75 years and beyond (Adhikari, 2013). With the growing age everyone has special needs and need of nutrition. Health and nutrition need of geriatric population are often ignored and unidentified (Singh & Soniya, 2016). Nepal's health program and policies have focused on issues such as population stabilization, maternal and child health, and disease prevention. There is an immediate need to recognize and highlight the issues that geriatric population face in

terms of their quality of life (Yadav, 2012). Nutritional status evaluations make it possible to decide if a population group is well nourished or undernourished. The main data collection methodologies that provide anthropometric information are: population-based surveys, growth monitoring and sentinel site and data and census data. An analysis of underlying causes of malnutrition will provide the understanding required to select the appropriate intervention (Ahmed & Haboubi, 2010).

## Materials and Methods

A semi-structured questionnaire was prepared in order to collect the data of elderly aged 90 and above residing in Bhaktapur Municipality comprising each ward. Valid data were collected by in-depth interview with the participants themselves and with the assistance of the family members in some cases who looks after them. The study was carried out using three approaches: nutritional assessment to gather data on nutrient intake

and food pattern, anthropometry to collect data on anthropometric measurement, and a household survey to collect information on different characteristics such as lifestyle and health condition. The questionnaire included questions about the respondent's general background, food diary, 24-hour recall, food group questionnaire, health condition and lifestyle. Informed consent was obtained from all participants and/or their related conservators. All participants were informed that they could refuse participation in any part of the discussion whenever they wished. Verbal consent from each respondent for their participation was obtained by all participants. The data obtained from semi structured questionnaire and in-depth interview were coded, entered and analyzed using Microsoft Excel version 2013. Screening tools commonly include the measurement of body mass index (BMI) (Cook, 2007). However, due to changes in posture and loss of height as people age, getting height and BMI measurements in older people can be difficult. Other body measurements can be used instead of determining standing height, although population and age-specific formulae are necessary (Weinbrenner & Vioque, 2006). Instead, demi-span (the distance between the mid-point of the sternal notch and the finger roots when the arm is stretched out laterally) can be employed, and it has been included in most years of health surveys. It is more reliable than other surrogate measures in the evaluation of nutritional status since it may be easily assessed without causing discomfort or suffering (Hirani & Tabassum, 2010). The nutritional status of the participants was analyzed by the help of MNA-SF as described by Nestlé Nutrition Institute (2013). The MNA-SF provides for a rapid assessment of a person's risk of malnutrition (Guigoz *et al.*, 2002) Likewise, qualitative data were recorded and coded by assigning labels to various categories.

**Results and Discussion**

For this study, a total of 35 elderly people aged 90 and above residing in Bhaktapur municipality were included. The study included 14 men and 21 women so male to female ratio was 2:3. The mean age was 94.86. Since, the study area was one of the oldest cities of Newar ethnicity 100% of the participants belonged to Newar community and followed Hinduism. Table 1 shows detail findings on socio-demographic status of the participants.

**Table 1:** Socio-demographic status of the participants (n=35)

Variables	Freq.	%
<b>Age group</b>		
90-94	20	57.2
95-99	11	31.4
100-104	4	11.4
<b>Gender</b>		
Male	14	40
Female	21	60
<b>Ethnicity/cast</b>		
Newar	35	100
<b>Religion</b>		
Hindu	35	100
<b>Education</b>		
Illiterate	24	68.5
Literate	9	25.7
Primary	1	2.9
Secondary	1	2.9
<b>Family type</b>		
Nuclear	14	40
Joint	13	37.1
Extended	8	22.9

**Table 2:** Health status of the participants (n=35)

Variables	Freq.	%
<b>BMI</b>		
Below 18	3	8.6
18 -25	25	71.4
Above 18	7	20
<b>Hypertension</b>		
Yes	10	28.6
No	25	71.4
<b>NCDs</b>		
Yes	9	25.7
No	26	74.3
<b>Medications other than NCDs</b>		
Yes	11	31.4
No	24	68.6
<b>Physical impairments</b>		
Yes	18	51.4
No	17	48.6

According to the findings, 8.6% of participants were underweight, 20% were overweight, and the rest 71.4% had a normal BMI. Non-communicable illnesses affected 25.7% of the participants, with diabetes

accounting for the majority of them. In the majority of instances, the parents appeared to have no prior history of NCDs, most likely because they were unaware of the conditions. Hypertension, i.e., high blood pressure (BP), was found in 28.6% of the total individuals. By birth, none of the individuals had any physical disabilities. But, Physical impairments such as eyesight and hearing problems were seen in 51.4% of the total individuals, which was statistically significant given their age. All of the senses in human body can be affected by aging, although vision and hearing are most commonly affected. This finding was also supported by the online information service produced by the United States National Library of Medicine (National Institute of Health, 2021).

**Table 3 :** Food intake pattern and 24-hour recall of the participants (n=35)

Parameters	Amount of Food	Freq	%
<b>Meals per day</b>			
≤5 times	-	28	80
> 5 times	-	7	20
<b>Fruits and Vegetables</b>			
Average	≥ 5 servings	28	80
Moderate	< 5 servings	7	20
<b>Meat Consumption</b>			
Regular	once daily	3	8.6
Average	≥ 3 times a week	6	17.1
Rare	≤ 3 times a week	26	74.3
<b>Processed Food consumption</b>			
Regular	at least once daily	29	82.9
Average	≥ 3 times a week	4	11.4
Rare	< 3 times a week	2	5.7
<b>Traditional/Ethnic Food consumption</b>			
Regular	at least once daily	1	2.9
Average	≥ 3 times a week	1	2.9
Rare	< 3 times a week	33	94.2
<b>Milk or Milk products consumption</b>			
Regular	at least once daily	21	60
Average	≥ 3 times a week	4	11.4
Rare	< 3 times a week	8	22.9
Nil	Never	2	5.7

**Sweetened Food**

Regular	at least once daily	21	60
Average	≥ 3 times a week	4	11.4
Rare	< 3 times a week	7	20
Nil	Never	3	8.6

**Water consumption**

Average	≥1 L per day	14	40
Moderate	< half liter	20	57.1
Rare	4-5 tbsp.	1	2.9

The food pattern among the individuals was significantly distinct. Rice and colorful vegetables appeared to be consumed more frequently than other foods on a daily basis. Boiled rice, eggs, milk, and dairy products were commonly the only sources of animal origin. The majority of the individuals had small but frequent meals, per the 24-hour dietary recall. 80% of the participants ate at least five meals on daily basis, while 20% ate more than five, with three main meals in the morning, evening, and afternoon, as well as additional little but frequent snacks. It seems that good nutrition was an element of the overall picture. There were no significant differences in the individuals' eating habits between previously (when they were younger) and presently. There were also no or very few restrictions on the individuals' eating habits. The sole exception was hard-to-chew food, as most of the participants' teeth were weak or missing owing to their age. There was no balanced distribution of nutritional consumption in the population examined.

The amount of fruits and vegetables consumed was satisfactory. On average, 80% of the participants consumed 5 servings of fruits and vegetables per day, whereas the other 20% ingested fewer than 5 servings per day. Fruits and vegetables are often regarded as the most essential component of a healthy diet for avoiding age-related illness. Researchers and the general public acknowledge that eating fruits and vegetables provides long-term health advantages (Nicklett & Kadell, 2013). All of the participants were non-vegetarians; however, their consumption of meat and eggs was limited due to financial constraints. Out of the total participants, 8.57% consumed meat or eggs on a daily basis, 17.41% consumed meat or eggs on an average basis, and 74.29% consumed meat or eggs seldom. Because the specific amount of protein consumed was not accessible by self, the individuals' meat/egg consumption pattern

was noted. Despite the fact that participants were fully aware of the value of meat or meat products, majority of them consumed meat or meat products on a limited basis because they could not afford it and it was unavailable to them. Furthermore, because many people lived in a joint or extended family, it was difficult for them to satisfy the requirements. For the participants who stated that they only consumed meat or meat products on rare occasions, there had to be special occasions such as festivals or feasts for them to consume meat or meat products.

The individuals appeared to be more reliant on processed foods. On a daily basis, 82.86% of participants consumed processed foods such as biscuits, bread, juice and energy drinks, 11.43% consumed on an average basis, and the remaining 5.71% consumed rarely. The reliance on processed food appeared to be high since it was readily available, simple to make, ready for immediate consumption, and more palatable. Also, traditional/ethnic food consumption (such as *chatamari*, *bara*, *yomari*, and *wo*) was extremely rare (94.28%) and 2.86% consumed frequently and on average. The majority of them only ate traditional/ethnic food on ethnic or special occasions. According to the elderly, they appreciated ethnic food solely on the occasion when it was prepared, resulting in a limited consumption of ethnic/traditional food.

60% of the participants consumed milk or milk products on a daily or regular basis, 11.43% on average, 22.86% rarely, and 5.71% did not eat any dairy products at all. The majority of the older individuals recognized that milk is a nutritious and healthy diet. The most popular dairy products among the elderly were liquid and curd-type yogurts, which were preferred for their taste and ease of digestion. They believed that dairy products like these could help with constipation and digestion issues. The participants who did not consume any milk or products did so solely because they did not want to or disliked the taste. Those who said they only ate once in a while said it was because they couldn't afford it.

On a regular basis, 60% of participants consumed at least one serving of sweetened or sugar-added food (such as sweets, sugar-added drinks such as tea or malt beverages, and chocolates), 11.43 percent consumed a few times each week, and 20% consumed rarely. As a result of their diabetes, 8.57 percent of the participants did not consume any sweetened foods at all. The elderly exhibited a lack of thirst or a reduced feeling of thirst. Water consumption was extremely low, with around

60% of the total population consuming less than half a liter of water. The majority of participants reported a lack of thirst and, as a result, a very low rate of water intake.

**Table 4:** Nutritional status of the participants (n=35)

Parameters	Freq	%
Malnourished	3	8.6
At risk of malnutrition	22	62.8
Normal	10	28.6

The nutritional status of the subjects was determined using the BMI and the findings of the MNA score. Despite the fact that the majority of the elderly appeared to be in good health, 62.8 percent (MNA score 8-11) were at danger of malnutrition, 8.6 percent (MNA score 0-7) were malnourished, and 28.6 percent (MNA score 12-14) were in a normal state. The majority of the participants were at danger of malnutrition, owing to a lack of understanding of dietary requirements as well as physical and mental health. The elderly or their caregivers appeared to be completely unaware of their nutritional status. There is a need for nutritional and health education, particularly among caregivers, because educated caregivers are more likely to provide better care in terms of appropriate nutrition and hygiene, which improves nutritional status.

**Table 5:** Lifestyle and physical status

Variables	Freq	%	
<b>Sleeping Hours*</b>	Excess <sup>1</sup>	21	60
	Average <sup>2</sup>	10	28.6
	Irregular <sup>3</sup>	4	11.4
<b>Napping</b>	Yes	22	62.9
	No	13	37.1
<b>Exercises</b>	Yes	9	25.7
	No	26	74.3
<b>Physical State</b>	Active	8	22.9
	Sedentary	2	5.7
	Moderate	25	71.4

\*For sleeping hours: (1) excess means more than 9 hours, (2) average means 7-8 hours and (3) irregular means less than 6 hours or difficulty in sleeping (Comfort Keepers, 2019).

Adults over the age of 65 should obtain 7-8 hours of sleep every night (Comfort Keepers, 2019). Several physical and psychological changes are known to occur

as people age, and one of the most problematic is adjusting to changes in sleep amount and quality. While sleep disorders affect people of all ages, data suggests that older persons are more vulnerable (Roepke & Ancoli-Israel, 2010). Likewise, 62.9% took naps during the day time. The results of an under observational study conducted by doctors in Japan on older adults who had claimed sleep problems revealed that taking brief naps after lunch helped enhance sleep efficiency and mental health (Tanaka, et al., 2001).

Only 25.7 % participants engaged in different physical activities or exercises such as yoga and brief walks, while the remaining 74.3 % did not. According to the study, 22.9 % people live an active lifestyle, 71.4 percent live a moderate lifestyle, and just 5.7 % live a sedentary lifestyle. The only explanation for the remaining 5.7% inactive lifestyle was sickness. Many elderly people have had modest and happy lives. The day began with a visit to the local temple for those who were able to complete their usual chores. During the day, elderly men gathered in a chowk or *falcha* with their friends, playing traditional Newari games and gossiping, while older ladies made *batti*, spoke with friends and relatives, and basked in the sun. Almost all of the participants were physically active when young and were involved in farming and liked the seasonal crops they grew in their fields, and some of them continued to do so whenever they could. Playing with the grandchildren seems to be one of their favorite stress relievers.

**Table 6:** Smoking and alcoholic beverages consumption habit of the participants (n=35)

Variables		Freq	%	
<b>Smoking</b>	Yes	M	6	42.9
		F	3	14.3
	No	M	8	57.1
		F	18	85.7
<b>Drinking</b>	Yes*	M	11	78.6
		F	15	71.4
	No	M	3	21.4
		F	6	28.6

\*For drinking habit: 'yes' indicates drinking alcoholic beverages on special occasions such as festivals and feasts, or a few times a month rather than on a daily basis.

Smoking was a habit for 42.9 % of the 14 men. Similarly, 14.3% of the 21 females polled had a smoking habit. In total, 25.7 % (both male and female) were current smokers, ranging from daily to 2-3 times a month. There were more male smokers than female smokers. While 57.1% of males and 85.7% of females had never smoked or used tobacco products in their lives. We may deduce from the survey that the majority of the participants, 74.3 % (78.6 % of males and 71.4% of females), consumed alcoholic drinks occasionally. Because all of the participants were from the Newar community, there was a tradition of drinking alcoholic beverages. The most popular alcoholic beverages were ethnic alcoholic beverages known as '*aila*' and '*tho*.' The people who consume 5 to <15 g of alcohol each day had the best chance of living to be 90 years old. Despite the fact that the risks are not considerable, excessive intake should be avoided (Brandt & Brandts, 2020).

**Conclusions**

The majority of the elderly were found to be nutritionally deficient, putting them at risk of malnutrition. The eating habits of the elderly were characterized by regularity, simplicity, and no overeating. Regardless of age, the majority had a healthy and contented life. The majority of older persons were found to have good physical and socioeconomic conditions.

**References**

Adhikari, S. (2013). Health, Nutrition and Care for Senior Citizens of Nepal in Twenty First Century. *J. of Health and Allied Sci.*, 73-75.

Ahmed, T. and Haboubi, N. (2010). Assessment and management of nutrition in elder people and its importance to health. *Clin. Interv. in Aging*, 5, 207-216.

Brandt, P., and Brandts, L. (2020). Alcohol consumption in later life and reaching longevity: the Netherlands cohort study. *Age and Ageing*, 49(3), 395-402.

CBS. (2012). *National Population and Housing Census 2011 (National Report)*. Kathmandu: Government of Nepal, Planning Commission Secretariat.

Comfort Keepers. (2019). *Seniors and Sleep: How much do they need?* Retrieved from Comfort keepers website: <https://www.comfortkeepers.com/info-center/category/senior-health-and-wellbeing/article/seniors-and-sleep-how-much-do-they-need>

- Cook, Z. (2007). Use of BMI in the assesment of undernutrition of older subjects: reflecting on practice. *Proc. Nutr. Soc*, 313-317.
- Guigoz, Y., Lauque, S. and Vellas, B. J. (2002). Identifying the elderly at risk for malnutrition. The Mini Nutritional Assessment. *Clin Geriatr Med*, 18(4): 737-757.
- Hirani, V., and Tabassum, F. (2010). Development of new demi-span equations from a nationally representative samples of adults to estimate maximal adult height. *J of Nutr.*, 140(8), 1475-1480.
- National Institute of Health. (2021). *Aging changes in the senses*. Retrieved from Medline Plus: <https://medlineplus.gov/ency/article/004013.htm>
- Nicklett, E. J., and Kadell, A. R. (2013). Fruit and vegetable intake among older adults: A scoping review. *Maturitas: An international journal of midlife health and beyond*, 305-312.
- Roepke, S., and Ancoli-Israel, S. (2010). Sleep disorders in the elderly. *Indian J Med Res*, 131, 302-310.
- SCA. (2006). *Senior Citizens Act, 2063(2006)*. Retrieved from Nepal Law Commission: <http://www.lawcommission.gov.np/en/archives/19011>
- Shrestha, L. (2013). Geriatric Health in Nepal; Concerns and Experience. *Nep. Med. College J.*, 148-152.
- Singh, D. R., and Soniya, S. (2016). Nutritional Status of Senior Citizens Living in Oldage Homes of Kathmandu Metropolitan Municipality. *Int. J. of Comm. Med. and Public Health*, 1707-1715.
- Tanaka, H., Taira, K., Arakawa, M., Toguti, H., Urasaki, C., Yamamoto, Y., Shirakawa, S. (2001). Effects of short nap and exercise on elderly people having. *Sleep-Wake Mechanism*, 173-174.
- Weinbrenner, T. and Vioque, J. (2006). Estimation of height and body mass index from demi-span in elderly individuals. *Gerontology*, 52(5), 275-281.
- Yadav, R. K. (2012). Ageing Population in Nepal: Challanges and Management. *Academic Voices: A Multidisciplinary J.*, 2(1) 48-53.

