Original article

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Nutritional Status and its Associated Factors among Elderly Population in Suryabinayak Municipality, Bhaktapur, Nepal

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ABSTRACT

Background: Malnutrition, which compromise immunity and functional ability jeopardizing quality of life, is common in elderly. The Sustainable Development Goals focus on healthy and active aging rather than just longevity, with nutrition being a key component to achieving this. This study aimed to determine the nutritional status and its associated fators among the elderly population of Suryabinayak municipality, Bhaktapur, Nepal.

Methods: A descriptive cross-sectional study design was used to study elderly population of 60 years and above from September 2022 to March 2023. Multistage cluster random sampling with probability proportionate to size was applied to select 473 samples. A face-to-face structured interview was conducted by using standard questionnaires. Anthropometric measurements were also performed. The test of association between nutritional status and related variables was performed using binary and multiple logistic regression.

Results: Among 473 participants, 53.1% were at risk of malnutrition and 12.3% were malnourished. The mean quality of life score was 26.4±4.3. Age more than 70 years (AOR: 3.12, 95% CI: 1.76-5.56), those with non-paid occupation (home makers) (AOR: 1.80, 95% CI: 1.02-3.24), belonging to the lower socio-economic status (AOR: 2.27, 95% CI: 1.52-3.80), and smokers (AOR: 1.65, 95% CI: 1.02-2.60) were found to be the predictors of malnutrition. There was a significant positive correlation between nutritional status and quality of life (r=0.612).

Conclusion: The elderly population is at high risk of malnutrition in Suryabinayak municipality. Periodic assessment of nutritional status helps to identify elderly who are at risk of malnutrition at its initial stage, and early preventive measure can improve their quality of life.

Keywords: Elderly, Nepal, nutrition, quality of life

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BACKGROUND

Elderly population of age 60 years and above is estimated to reach up to 1.4 billion by 2030 and 2.1 billion by 2050 increasing at alarming rate specially in developing nations.(1-3) Similar trend can be observed in Nepal with the population above 60 in Nepal increased from 3.3% in 1981 to 8.13% in 2011 and was foreseen to reach up to 18.6% by 2050.(4-6)

Malnutrition in elderly is very frequent leading cause towards clinical symptoms and compromising quality of life.(7) For successful and healthy aging, the role of good nutrient is very important.(8,9) Malnutrition may increase morbidity and mortality rate creating extra burden and compromising the quality of life for individuals, health systems and the whole nation.(2)

The Sustainable Development Goal (SDG) has emphasized healthy ageing addressing the elderly where nutrition is one the key components to achieve its goal. (10) Few studies have been carried out to assess the nutritional status particularly among elderly population in Nepal. Therefore, this study aimed to determine the nutritional status and its associated fators among elderly population of Suryabinayak municipality, Bhaktapur, where there were limited studies conducted on nutritional status of elderly.

METHODS

Study design and population

This was a descriptive cross-sectional study conducted from September 2022 to March 2023 among elderly population aged 60 years and above of Suryabinayak municipality, Bhaktapur District. Elderly who were disoriented, physically disabled and bed-ridden were excluded from the study due to possible issues with communication and anthropometric measurements.

Sampling and sample size

The sample size was determined using the formula, $\mathbf{n} = \frac{Z^2pq}{d^2}$ where, z = standard normal variate, with value 1.96 at 95% confidence interval, p = prevalence of malnutrition (p=0.248) with reference to a study in India due to similarity in socio-cultural and economical context,(11) q = 1-p, and d = allowable error, taken as 5%. Assuming design effect of 1.5 and adjusting for 10% non-response rate, the final calculated sample size was 473. Initially, among 10 wards of Suryabinayak municipality, 4 wards (one-third of the total number of wards) were selected as clusters using simple random sampling by lottery method. Then, probability proportionate to size (PPS) sampling was done among the 4 wards. The first household was selected randomly and then based on systematic random sampling, kth rule was applied to find out another household in which every 5th household was selected. Now, individual elderly was selected from that particular house. In case the elderly was absent in that particular house, the adjacent house was selected and this process was continued till we reached the desired sample size. When more than one elderly was present in the selected household, only one elderly was selected randomly using lottery method.

Data collection tools and techniques

Data collection was performed via face-to-face structured interview. Door to door home visit was done to find out the eligible participants. Firstly, interview was conducted followed by anthropometric measurement. The data collection tools for the study were Mini Nutritional Assessment (MNA) tool to identify nutritional status among elderly,(12) EUROHIS-QOL-8 item tool to identify quality of life,(13) Seca 874 digital weighing scale, Prestige HM 006-A portable Stadiometer, MUAC tape for adult. The MNA tool is a screening tool to identify malnourished or at risk of malnutrition among elderly population before severe changes in weight or serum protein levels occur. It is assessed based on questions and anthropometric measurements including height, weight, mid-arm circumference and calf circumference. The nutritional status was assessed based on the Scoring system. Score of 24-30 points are considered as normal nutritional status; 17-23.5 indicates at risk of malnutrition; and <17 points indicates malnutrition. It is also validated in Nepalese language with reliability value, Cronbach's alpha (r) 0.80.(12)

Similarly EUROHIS-QOL-8 is a tool developed by WHOQOL group as an economic screening measure. It has 8 items with five-point likert scale and the scores range from 8-40 with higher scores indicating better QoL. It has been validated and has good reliability factor (Cronbach's alpha 0.83).(13,14)

Data analysis

The collected data were coded and entered in EpiData 3.1 version and analyzed in Statistical Package for Social Sciences version 20. For descriptive data, frequency, percentage, mean, and standard deviation were calculated. To find out the association between dependent and independent variables, binary and multiple logistic regression was used. Crude and adjusted odds ratio were calculated with 95% confidence interval. The scatter diagram and Pearson's correlation were used to identify relationship between nutritional status and quality of life.

Ethical considerations

Ethical approval was taken from the Institutional Review Committee at Tribhuvan University Institute of Medicine [257(6-11)E2079/080]. Approval for the study was obtained from Suryabinayak municipality. Informed written consent was also obtained from each participant before data collection.

RESULTS

Socio-demographic characteristics of the study participants

Altogether 473 participants were included in the study. The mean age of the participants was 68.8 (±7.8) years, with majority (66.6%) falling in the age group 60-70 years. More than half were females (55.8%), and about three-fourths (75.7%) were Brahmin/Chhetri by ethnicity. Most of the elderly were married (67.4%) and belonged to joint family (74.4%). Majority had no formal education (57.9%) and were financially dependent on their family members (65.1%) (Table 1).

Table 1. Socio-demographic characteristics of the study participants (n=473)

Sociodemographic Characteristics	Number	Percentage (%)
Age (in years)		
60-70	315	66.6
>70	158	33.4
Sex		
Male	209	44.2
Female	264	55.8
Ethnicity		
Brahmin/Chhetri	358	75.7
Janajati	103	21.8
Dalit	8	1.7
Madhesi	4	0.8
Marital Status		
Married	319	67.4
Widowed	136	28.8
Unmarried	12	2.5
Divorced/Separated	6	1.3
Family type		
Joint	352	74.4
Nuclear	94	19.9
Extended	27	5.7
Educational Status		
No formal education	274	57.9
Primary(1-5)	72	15.2
Secondary(6-10)	78	16.5
Higher Secondary and above	49	10.4
Occupational Status		
Home maker	229	48.4
Agriculture	131	27.7
Retired	80	16.9
Currently working	33	7.0
Financially Dependent		
Yes	164	65.1
No	309	34.9

Nutritional status of elderly

Figure 1 presents the nutritional status of elderly based on mini nutritional assessment (MNA) Score. Over half of the participants (53.1%) were at risk of malnutrition and 12.3% were malnourished.

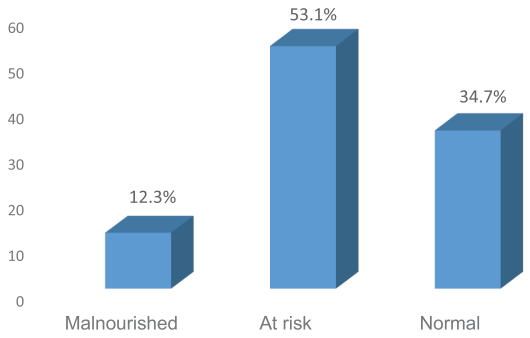

Figure 1. Nutritional status of elderly

Socio-demographic factors associated with nutritional status

The adjusted regression model shows that age, occupation, socio-economic status and smoking were significantly associated with nutritional status. Elderly with age more than seventy were three times likely to have malnutrition than those with lower age group (AOR: 3.12, 95% CI: 1.76-5.56). Likewise, the elderly from non-paid occupational category were about twice likely to have malnutrition as compared to their counterparts (AOR: 1.83, 95% CI: 1.03-3.25). Those who belonged to the lower socio-economic status were about two times likely to have malnutrition as compared to those who belonged to upper socio-economic status (AOR: 2.40, 95% CI: 1.52-3.80). Smokers had higher likelihood for malnutrition compared to non-smokers (AOR: 1.63, 95% CI: 1.02-2.60) (Table 2).

Table 2. Unadjusted and adjusted relationship between nutritional status and independent variables

Explanatory variables	Nutritional status					
	Malnutrition n (%)	Normal n (%)	COR	95%CI	AOR	95%CI
Age (in years)						
>70	134 (84.8)	24 (15.2)	4.47	2.74-7.28	3.12	1.76-5.56
60-70	175 (55.6)	140 (44.4)	Ref.			
Occupation						
Non paid	184 (80.7)	44 (19.3)	4.01	2.66-6.07	1.83	1.03-3.25
Paid	125 (51.0)	120 (49.0)	Ref.			
Socioeconomic status						
Lower	198 (76.7)	60 (23.3)	3.09	2.09-4.58	2.40	1.52-3.80
Upper	111 (51.6)	104(48.4)	Ref.			
Smoking status						
Smoker	189 (72.4)	72 (27.6)	2.01	1.37-2.95	1.63	1.02-2.60
Non-smoker	120 (56.6)	92 (43.4)	Ref.			

Note:* Statistically significant at 95% level of confidence

Correlation between nutritional status and quality of life

The mean quality of life score (QoL) was 26.4±4.3. Figure 2 presents the scatter diagram depicting moderate positive correlation between mean score of QoL and mean score of MNA (r=0.612), which was found to be statistically significant (p<0.01) (Table 3).

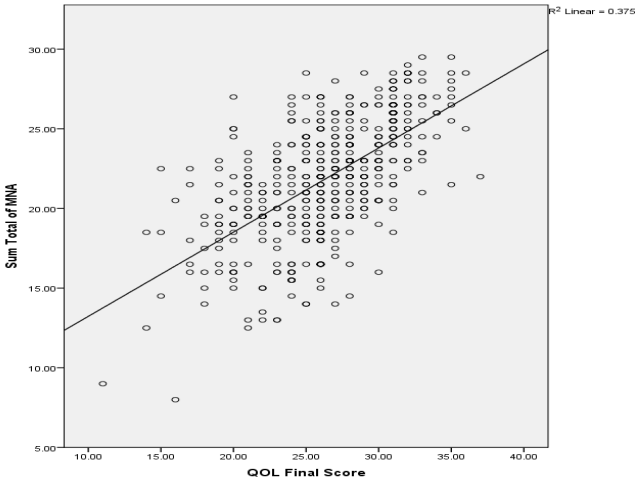

Figure 2. Scatter Diagram showing correlation between mean QoL Score and MNA score

DISCUSSION

This study assessed the nutritional status, its associated factors, and the association between nutritional status and quality of life among elderly population in Suryabinayak municipality. We identified that most of the elderly are at risk of malnutrition and there is moderately positive correlation between nutritional status and quality of life among elderly. Age, occupation, socio-economic status and smoking habit were identified as the predictors of nutritional status.

Majority of the elderly (53.1%) were at risk of malnutrition and 12.3% were malnourished which is similar to a study conducted in Siraha district, Nepal which showed 45.7% of the respondents were at risk of malnutrition and 19.8% elderly were malnourished. (15) Similarly, the studies conducted in Sri Lanka and India showed that malnutrition prevalence ranges from 12.5%-17.9% to that of risk of malnutrition ranges from 52.4%-58.7%.(16-18) In contrary, studies of Pakistan, Malaysia and Iran revealed lower prevalence of malnutrition (7.3%, 5.5%, 5%).(19-21) This difference may be due to variation in the study settings.

This study revealed that malnutrition is associated with age. Elderly above 70 years of age were 3.12 times likely to have malnutrition compared to lower age group whereas a study conducted in South central part of Nepal showed the even higher odds of being malnourished (OR: 28.34). (12) Other studies conducted in Nepal, Sri Lanka, Poland and Colombia also showed significant positive association between age and malnutrition. (16,22-24,26) This might be due to various physiological and psychological changes among old age population leading to loss of appetite and lack of energy. Thus, nutritional status of elderly should be focused specially in their advance age.

This study confirmed that the elderly from non-paid occupational category were 1.8 times more likely to have malnutrition as compared to the elderly from paid occupational groups. This finding is consistent with another study conducted in Morang district of Nepal which showed unpaid elderly were 3.2 times more likely to be malnourished than paid elderly.(25) Consistent with this study finding, another study of Ethiopia also showed non-paid elderly were 1.31 times more likely to be malnourished than elderly involve in paid job. (26) This might be because the elderly from non- paid occupational group are financially unstable with poor purchasing power and may not be able to consume nutritious diet. This study also confirmed an association between nutritional status and socio-economic status of the elderly. Elderly belonging to the lower socio-economic status were 2.27 times more likely to have malnutrition as compared to those belonging to the upper socio-economic status. This finding is supported by other studies conducted in Botswana, India and Sub-Saharan Africa which highlights the association of nutritional status with lower socio-economic status.(27-29) This suggests that socio-economic status is a crucial factor influencing the nutritional status of elderly.

Smoking decreases appetite as well as body's ability to absorb vitamins and minerals.(30) Our study also found that elderly who smoke were 1.6 times more likely to have malnutrition compared to never smokers. This finding is congruent with other studies conducted in Rupendehi, Pyuthan and Kathmandu which showed significant and positive association between nutritional status and smoking habit.(31)

The correlation between nutritional status and quality of life among elderly showed moderately strong positive correlation (r=0.612, p=<0.01) that is consistent with the similar study conducted in Lahan municipality of Nepal (p=0.001).(15) Likewise, another similar study conducted in Vienna, Austria also revealed the association between Quality of life and nutritional status among elderly (β=0.26; p=0.016).(32) All the above findings signify the need for regular nutritional assessment among elderly so as to detect the nutritional problems at the early stage and adopt appropriate and

targeted preventive measures. Nutritional requirement for elderly in India is shadowed in entire family and community since past.(28) We can predict similar scenario in Nepal too. Therefore, nation-wide large-scale research in Nepal is required to overcome this hidden public health problem.

This study used the standard tools to evaluate the nutritional status and quality of life among the elderly. However, it has some limitations. Because the research was conducted in a single municipality, it cannot be generalized to the entire Bhaktapur district. Additionally, there might be recall bias for some questions (such as frequency of meat, milk, and egg consumption, smoking duration etc.) and social desirability bias on self-reported data, such as smoking habit.

CONCLUSION

One-fifth of the elderly in our study had malnutrition and about half were at risk for malnutrition which indicates a problematic issue associated with the advancing age. Elderly from income generating occupational category and from higher socioeconomic status were less likely to be malnourished compared to the non-paid and lower socioeconomic status groups. Smoking is found to be significantly associated with malnutrition. We found positive correlation between nutritional status and overall QoL. Thus, periodic assessment of geriatric nutritional status by using simple, reliable, and inexpensive tools such as Mini Nutritional Assessment (MNA) is recommended to identify those at risk of malnutrition at an initial stage and adopt early preventive measures so as to improve the quality of life.

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Conflict of Interest

The authors declare no conflict of interest.

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