

Nutritional Status of the Elderly Population Having Dental Problem in the Selected Community

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ABSTRACT



Background: Good nutrition is the foundation for a healthy life. Malnutrition is associated with higher rates of morbidity and mortality as well as increased health care expenditures, and prolonged hospital stays. Elderly People are uniquely susceptible to malnutrition due to the association of aging with various factors that influence nutritional status. Dental Problems in elderly can cause difficulty with chewing food and swallowing, leading to a decrease in nutrient intake affecting nutritional status. Thus, the objective of the study was to assess the nutritional status of the elderly population having a dental problem in Harisiddhi, Lalitpur, Nepal

Methodology: A community-based cross-sectional descriptive study was undertaken at, Harisiddhi, Lalitpur with one hundred fifty (N=150) elderly people by using a systematic random sampling method. The Mini-Nutritional Assessment – Short Form tool was utilized for interviewing elderly people.

Results: The main findings of this study revealed that 60% of the elderly people having dental problems were at risk of malnutrition, only 22% had normal nutritional status and 18% of the respondents were malnourished. The average Body Mass Index of elderly people was 27.1 kg/m². There was a significant association between age, educational status, types of family, income source, type of dental problem, and nutritional status of the respondents.

Conclusions: More than half of the elderly people having dental problem are at risk of malnutrition and only a few have normal nutritional status so nutritional counselling and dental health program should be conducted among the elderly people focusing on the importance of balanced diet, activity and dental health for maintaining the nutritional status within their motivation and energy level.

Keywords: Dental Problems, Elderly People, Nutritional Status

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INTRODUCTION

Globally, the number of an elderly population is increasing day by day as a result of the declining fertility rate, improved public health interventions, and increasing life expectancy of the people.¹ Elderly people account for 12.3% of the world population, and it is expected that the number will rise to 22% by 2050.² In Nepal, 9.1% of the total population has been occupied by elderly people that was only 6.5 percent in 2001.³ Malnutrition in the elderly is a multidimensional concept encompassing physical, physiological, and psychological elements. Physical factors that affect malnutrition include oral health, physical impairments, and early satiety.⁴ Poor oral health along with dental problems like edentulousness without a prosthesis, filling teeth can cause difficulty with chewing food, swallowing leading to decrease in nutrient intake which is associated with poor nutritional status in the elderly.^{4,7}

A study in Brazil to assess the nutritional status of an elderly depicted the prevalence of underweight as 27.3% in men and 12.8% in women.⁸ A similar study in India revealed 15% of elderly people were malnourished and 55% were at risk of malnutrition.⁹ The national-level data regarding the nutritional status of elderly people is lacking as more attention is given on child and women nutrition but the various study conducted in different parts of Nepal depicted more than half of the elderly people are at risk of malnutrition.^{10,11}

Though the maintenance of oral health is essential to the nutritional status, in developing country like Nepal the elderly nutrition and dental problem are given less priority. Thus the study aimed in assessing the nutritional status of elderly people having a

dental problem. It may be used as a baseline database to assist with the initiation of important programs related to elderly nutrition and dental program which is under shadowed in our country.

MATERIALS AND METHODS

A community-based cross-sectional study design was used to assess the nutritional status of elderly in ward number 29, Harisiddhi of Lalitpur Metropolitan city from 17 April 2019 to 15 May 019. All the elderly people having a dental problem of ward no 29, Harisiddhi who were available during the data collection time were considered as the study population. Elderly people who refuse to give consent, who didn't have any dental problems and who had been hospitalized for the last 3 months were excluded from the study. The study proceeded upon ethical clearance from Nepal Health Research Council (NHRC, Reg. No. 99/2019) and taking written permission from the ward office. A total of 150 elderly people were enrolled in this study by using systematic random sampling as shown in (Figure 1).

Sample size was calculated by using the prevalence of malnutrition in elderly people 10% from previous study¹² based on Cochran formula ($n = Z\alpha^2 PQ / d^2$) where n= sample size, Z=1.96 at confidence interval (CI) of 95%, P=the prevalence of malnutrition in elderly people = 10% = (0.1) (Q=1-P), d=degree of precision=0.05. A structured interview schedule was used to collect data from the respondents. The instruments consists of socio-demographic variables, data regarding types of dental problems which included the presence of DMFT (Dental carries, Missing teeth and Filling teeth)¹³ and the Mini Nutritional Assessment-Short Form (MNA-SF)

tool to assess the nutritional status of the elderly population. MNA-SF is a validated tool used in many countries along with Nepal.^{10,14,15} MNA-SF total scores was 14, out of which

elderly people who secured 12-14 points were considered as having normal nutritional status, 8-11 at risk of malnutrition and 0-7 points were included as malnourished.¹¹

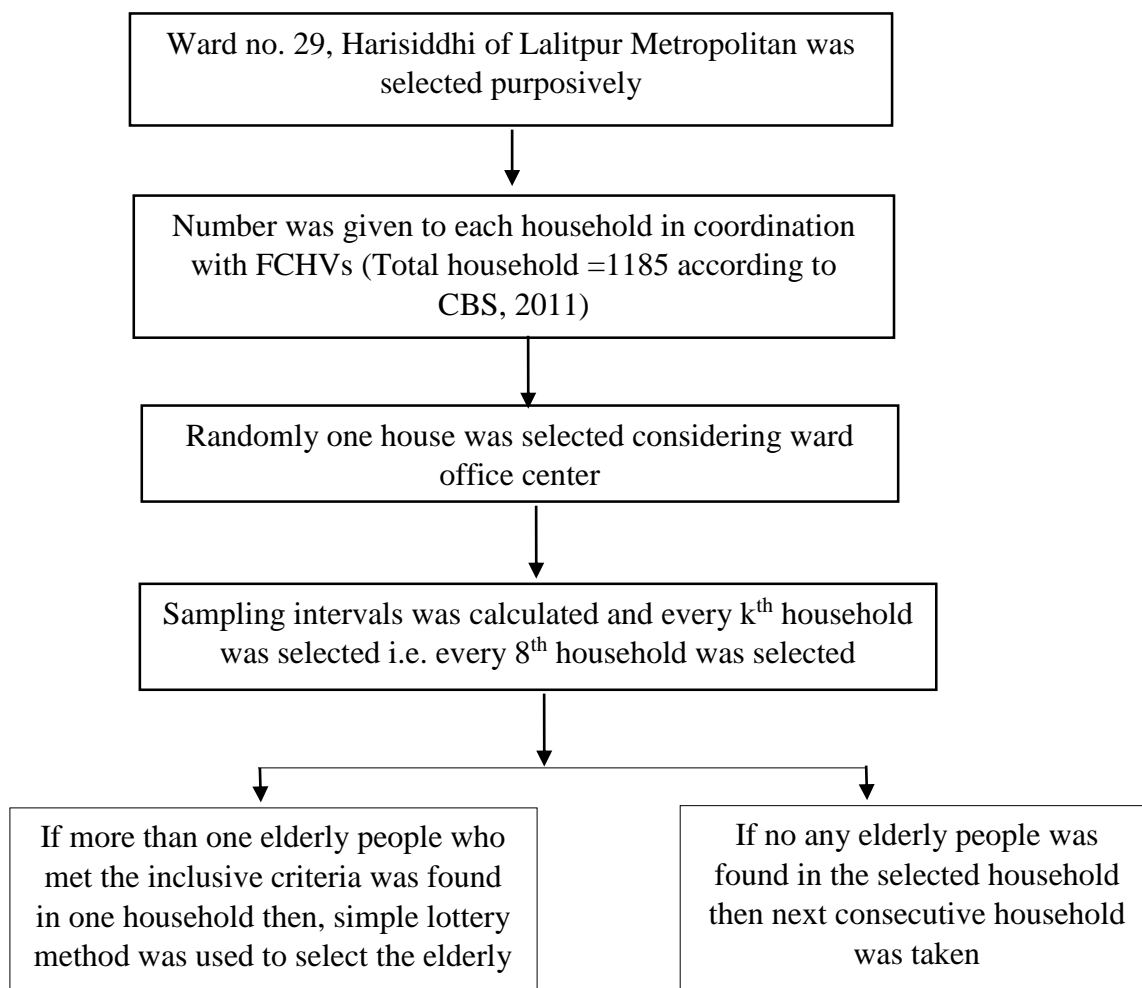


Figure 1: Sampling techniques to select the respondents

Data were collected by using a structured face to face interview schedule in the Nepali version. Written informed consent was taken from each elderly by describing the objective of the study. The schedule for data collection was 9 AM – 3 PM except for public holidays and each day 5-6 respondents were interviewed. The average time to require completing the interview was about 10-15 minutes. For Anthropometric measurement, height was measured using a mechanical

stadiometer and weight with a digital weighing scale. Measurements were taken in light clothes and with bare feet of the respondents.

The collected data were edited, coded, categorized and, then entered into Microsoft Office Excel and exported to SPSS software (Statistical Package for Social Science) version 16. Data were analyzed by using descriptive statistical methods such as frequency, percentage, mean and standard deviation, and

inferential statistics chi-square test was used to find out association at the 5% level of significance. Results were considered statistically significant if the P-value <0.05.

RESULTS

Out of 150 elderly people, 85 (56.7%) were from the age group 60-75 years with mean age 71.1 ± 8.4 years ranging from 61 to 100 years, 76 (50.7%) were males and the majority of the respondents were relatively advantaged Janajati 90 (60.0%) following Hindu religion 104 (69.3%). Likewise, the majority of the respondents 122 (81.3%) were married, 112 (74.7%) were illiterate and out of literate respondents, 30 (79%) had completed primary education. More than half of the respondents 90 (60.7%) were from the joint family and 112 (74.7%) depends on the family for the source of the income (Table 1). Majority of the

respondents 125 (83.3%) had missing teeth, 116 (77.3%) had dental caries 105 (72%) did not have filling teeth (Table 2). More than half of the respondents 90 (60%) were at the risk of malnutrition, only 33 (22%) had normal nutritional status and 27 (18%) of the respondents were malnourished (Table 3). Nearly half of the respondents (51.3%) had a moderate decrease in food intake and the majority of the respondents (84%) did not know about the weight loss. Most of the respondents (86%) goes out. More than half of the respondents (62.7%) did not have an acute disease or psychological stress within 3 months. Likewise (61.3%) of the respondents had mild dementia and 54.7% of the respondents had BMI 23 or great (Table 4).

Table 1: Socio-Demographic Characteristics of the Respondents (N=150)

Variables		Frequency	Percentage (%)
Age in years	60-70	85	56.7
	70-80	45	30.0
	>80	20	13.3
	Mean \pm SD 71.1 ± 8.4		
Minimum age:	61 years		
Maximum age:	100 years		
Gender	Male	76	50.7
	Female	74	49.3
Ethnicity	Relatively advantaged Janajati	90	60.0
	Upper caste groups	40	26.7
	Disadvantaged Janajati	13	8.7
	Dalit	7	4.6
Religions	Hinduism	104	69.3
	Buddhism	36	24.0
	Christianity	10	6.7
Marital status	Married	122	81.3
	Widow	21	14.0
	Widower	7	4.7

Educational status	Literate	38	25.3
	Illiterate	112	74.7
If Literate (n=38)	Primary	30	79.0
	Secondary	8	21.0
Types of family	Nuclear	59	39.3
	Joint	91	60.7
Source of income	Pension	20	13.3
	Depends on Family	112	74.7
	Business	18	12.0

Table 2: Types of Dental Problems

(N=150)

Variables		Frequency	Percentage (%)
Missing teeth	No	25	16.7
	Yes	125	83.3
Dental caries	No	34	22.7
	Yes	116	77.3
Filling teeth	No	105	72.0
	Yes	45	28.0

Table 3: Nutritional Status of Elderly People

Nutritional status	Frequency	Percentage (%)
Normal nutritional status	33	22
At the risk of malnutrition	90	60
Malnourished	27	18

Table 4: Frequency Distribution of the Score on MNA Tools of the Respondents (N=150)

Variables		Frequency	Percentage (%)
Declined food intake	No decrease in food intake	73	51.3
	Moderate decrease in food intake	77	48.7
Weight loss	Weight loss greater than 3 kg	2	1.3
	weight loss between 1 and 3 kg	14	9.3
	No weight loss	8	5.3
	Does not know	126	84
Mobility	Bed or chair bound	5	3.3
	Able to get out of bed/chair, but does not go out	16	10.7
	Goes out	129	86
Acute disease or Psychological stress	Yes	56	37.3
	No	94	62.7
	Severe dementia or depression	8	5.3
	Mild dementia	92	61.3

Neuropsychological problems	No Psychological problem	50	33.3
Body Mass Index (BMI)	BMI of less than 19	11	7.3
	BMI 19 to less than 21	20	13.3
	BMI 21 to less than 23	37	24.7
	BMI 23 or great	82	54.7

Table 5: Association between Types of Dental Problems with the Nutritional Status of the Respondents (N=150)

Types of dental problems		Nutritional status				p-value
		Normal	Risk of Malnutrition	Mal-nourished	Chi- Square Value	
Missing teeth	No	9(36.0%)	13(52%)	3(12.0%)	7.084	0.029*
	Yes	18(14.4%)	77(61.6%)	30(24.0%)		
Dental Caries	No	6(17.6%)	19(55.9%)	9(26.5%)	5.27	0.768
	Yes	21(18.1%)	71(61.2%)	24(20.7%)		
Filling Teeth	No	17(16.2%)	58(55.2%)	30(28.7%)	8.830	0.012*
	Yes	10(22.2%)	32(71.1%)	3(6.7%)		

Note:* p<0.05 significant at 95% confidence level

There was a significant association ($p=0.029$) between missing teeth and the nutritional status of the elderly. Similarly, those respondents who had filled their teeth after caries are at a lower risk of malnutrition than those who hadn't filled their teeth and are

significantly associated ($p=0.012$) at a 95% level of significance (Table 5).

Nutritional status was significantly associated with age ($p=0.000$), educational status ($p=0.047$), types of family ($p=0.035$), and source of income ($p=0.037$) (Table 6).

Table 6: Association of Socio-demographic Variables with Nutritional Status of the Elderly People

Variables		Nutritional Status			Chi-square value	p-value
		Normal	Risk	Mal-nourished		
Age (years)	60-70	23(27.1%)	51(60.0%)	11(12.9%)	16.561	0.000*
	70-80	2(4.4%)	31(68.9%)	12(26.7%)		
	>80	2(10.0%)	8(40.0%)	10(50.0%)		
Sex	Male	17(24.0%)	42(55.3%)	17(22.4%)	2.219	0.330
	Female	10(14.0%)	48(64.8%)	16(21.3%)		
Educational Status	Literate	9(24.0%)	26(68.4%)	3(7.6%)	6.118	0.047*
	Illiterate	18(16.1%)	64(57.1%)	30(26.8%)		

Family Types	Nuclear	15(25.4%)	28(47.5%)	16(27.1%)	6.686	0.035*
	Joint	12(13.2%)	62(68.1%)	17(18.7%)		
Income Source	Pension	6(30.0%)	11(55.0%)	3(15.0%)	10.219	0.037*
	Depends on Family	14(13.0%)	70(62.5%)	28(25.0%)		
	Business	7(38.9%)	9(50.0%)	2(11.1%)		
Marital status	Married	24(20.0%)	72(59.0%)	26(21.0%)	1.261	0.532
	Widow/er	3(11.0%)	18(64.0%)	7(25.0%)		
Ethnicity	Relatively advantaged Janajati	14(15.6%)	59(65.6%)	17(18.9%)	8.895	0.180
	Upper caste	10(25.0%)	19(47.5%)	11(27.5%)		
	Disadvantages Janajati	0(0.0%)	9(75.0%)	3(25.0%)		
	Dalit	3(37.5%)	3(37.5%)	2(25.0%)		

Note:* $p < 0.05$ significant at 95% confidence level

DISCUSSION

The current study shows more than half of the respondents (60%) are at risk of malnutrition, only 22% are well-nourished and 18% of the respondents are malnourished. A similar study done in India, rural Nepal, Bangladesh and German displayed 55%, 65%, 61.7% and 57% respectively were at risk of malnutrition.^{9,10,16,17} which is consistent with the findings of present study. Many of the elderly people are at risk of malnutrition because of the social and economic deprivations of the elderly people, lack of proper awareness about the importance of the nutrition in elderly people and emphasis is given for child and women nutrition, nutritional status of the elderly population in low-income countries is seldom focused upon. In contrary to these, a study conducted in Lebanon showed only 8.0% of the individuals were malnourished and 62.9% had normal nutritional status.¹⁸ In the present study, average BMI score is 25.38 kg/m² which resemble the previous study where the average BMI of the participants was 21.4±3.9

kg/m².¹⁰

Present study illustrates missing teeth shows significant association with nutritional status of the elderly; which is similar to the previous study findings whereby people who had broken natural teeth or missing teeth had trouble eating firm foods than those who had healthy natural teeth which affect the nutritional status of the elderly people.⁷ There is no significant association ($p=0.768$) between dental caries and the nutritional status of the elderly in the present study.

Filling teeth is significantly associated with the nutritional status of the elderly ($p=0.012$) in the current study. These findings were supported by the previous study which indicated dental problems like tooth loss, filling teeth, denture - wearing; altered dietary choices which lead to poor nutritional status.¹⁹ A similar observation was shown in a study in Iran where dental problems were significantly associated with the nutritional status.²⁰ This may be because elderly people with dental

problems don't have a variety of options for a balanced diet which may cause lack of nutrients which in turn causes malnutrition.

In the current study, age shows a significant association with nutritional status which is in line with the findings of previous studies.^{9,16, 21} Consistent with the findings of the present study, the study from Nepal, India, even from Italy and Iran^{10,21,22-24} showed the prevalence of malnutrition to be higher among females compared to male, however, findings in the present study were not significant. The females are at risk of malnutrition because of the male dominant society and their nutrient needs during various stages of life are neglected. Beside this women customarily allocate more and nutritious food to men, while making low-calorie staples themselves.²⁵ A study done in Nepal²⁶ showed the proportion of malnourished was higher among illiterates which is consistent with the present study.

There is a significant association between types of family and nutritional status ($p=0.03$) where respondents who lived in a joint family are at risk of malnutrition than those who lived in a single family. This might be due to in joint family, priority is given on child nutrition rather than elderly and elderly people share the nutritious/delicious food to their grand-children instead of eating themselves. Respondents who were dependent on the family as a source of income are at risk of malnutrition and are significantly associated

($p=0.04$). Similarly, few studies supported that financial dependency on family was significantly associated with poor nutritional status.^{9, 21, 27}

Overall this study highlights nutritional status of elderly having dental problems of urban community. The limitation is this study was carried out only among the elderly population of ward no 29, Harisiddhi of Lalitpur Metropolitan City. So, it may not be representative of the overall population.

CONCLUSION

The study concluded that more than half of the elderly people having dental problems are at risk of malnutrition. Dental problems like missing teeth and filling teeth were significantly associated with nutritional status. Therefore, this study emphasizes the need to conduct dental health and nutrition programme focusing on elderly people to promote nutritional status. Government and Community group should offer financial support program to age above 80 elderly, who don't have any income source and illiterate elderly people as the study shows they are more vulnerable to develop malnutrition.

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