Research Article

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Nutritional status of elderly in rural areas of Haldwani, Nainital district of Uttarakhand

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ABSTRACT

Background: Diet and nutrition are important factors in the promotion and maintenance of good health throughout the entire life course. Ageing is often accompanied by the occurrence of illness, which may increase the risk of nutritional deficiency. This study was conducted with the objective to know the nutritional status of elderly.

Methods: A community based cross-sectional study in rural areas of Haldwani was done over a period of one year. Two stage sampling technique was used to collect the data from 440 elderly aged 60 years and above on a pretested semi structured questionnaire. Data was entered into Microsoft excel sheet, coded and then analysed using SPSS version 16. Chi square test was used as test of significance and p<0.05 was considered significant.

Results: Most (59.54%) of the elderly belongs to 60-69 years of age, females (57.5%) outnumbered males. Majority of the aged were married (59.77%), living in joint families (92.5%), illiterate (60%), not working (78.64%) and belonging to class III socio-economic status (59.09%). Overall 51.36% of the elderly were non vegetarian. The difference in dietary habits of male and female elderly was found statistically significant (χ^2 =21.4, p=0.001). The difference in BMI of elderly males and females were found statistically significant (χ^2 =10.0, p=0.019). BMI decreases with increase in age and this was found statistically significant (χ^2 =13.6, p=0.034).

Conclusions: Nutritional assessment of the elderly is essential because it is one of the measures to assess the health status of elderly.

Keywords: Nutritional status, Body mass index, Elderly, Rural

INTRODUCTION

Malnutrition can be defined as the state of being poorly nourished. It may be caused by the lack of one or more nutrients (under-nutrition), or an excess of nutrients (over nutrition).¹

An estimated 5-10% of elderly people living in the community setting are malnourished. It increases morbidity, mortality and decreases quality of life.²

Nutritional needs change throughout life. For the elderly, these changes may be related to normal aging processes,

medical conditions, or lifestyles. Assessment of nutritional status is essential for preventing or maintaining a chronic disease and for healing.³

With this background, this study was undertaken to assess the nutritional status of elderly.

METHODS

A community based cross-sectional study was carried out in the catchment areas of the block level Primary Health Centre (PHC) attached to the department of Community

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Medicine. This study was carried out over one year period from November 2013-October 2014.

Due to lack of information on health status of geriatrics in the study area, a default prevalence (p) of 50% was taken and at 5% of absolute precision, sample size was calculated by the formula ($n = 4 \text{ pq/d}^2$) as 400. Assuming 10% non-response rate the final sample size was fixed at 440.

Two stage sampling technique was applied, as in 1st stage 11 subcentres (SCs) were selected randomly out of 22 SCs attached to block PHC, 40 elderly were selected from each of these 11 SCs to get the adequate sample size of 440. A list of all the elderly was made for all SCs selected from the sub centre survey register maintaining the order of the families as per the survey done. In the second stage, to choose elderly from the study population, every 10th elderly had to be taken. This approximate sampling interval was calculated on the basis of desired sample size and total elderly population satisfying inclusion and exclusion criteria. If some elderly did not consent for the interview or could not be contacted then the next name was selected from the list.

Inclusion criteria: People aged 60 years and above, who were permanent resident of the study place and gave consent and volunteer to participate. Elderly relative who visited the family and were present at the time of study was not taken.

A pretested semi structured questionnaire was administered and required information was obtained from the elderly subjects after ensuring confidentiality by house to house visit.

The data obtained was coded & entered in Microsoft Excel. Analysis was done using SPSS version 16 and descriptive interpretation of data was done in the form of percentages. The Chi square test was used as test of significance and p<0.05 was considered significant.

Ethical clearance was obtained before conducting the study from the Institutional Ethics Committee.

Height - measured to the nearest centimeter using a wall mounted measuring tape with the subject standing erect and barefoot.

Weight - measured to the nearest 0.5 kg using a Krups weighing scale.

Body Mass Index (BMI) - calculated as body weight in kilograms (kg) divided by square of the height in meter (m²). Elderly were classified into four groups: Underweight (BMI = <18.5 kg/m²), Normal (BMI = 18.5 - 24.99 kg/m²), Overweight (BMI = 25 - 29.99 kg/m²) and Obese (BMI = 230 kg/m²) according to WHO classification.

RESULTS

Out of 440 elderly, majority (59.54%) belongs to 60-69 years of age group. It was observed that with increase in age number of elderly decreased. The number of females (57.5%) outnumbered males. About 59.77% of the elderly were married and rest widowed. Most (92.5%) of the elderly lives in a joint family. 60% of the elderly were illiterates and about 78.64% were not involved in any kind of gainful employment. Mostly (59.09%) belong to class III as per modified BG Prasad's classification (Table 1).

Table 1: Distribution of elderly according to their socio-demographic profile.

Variables	Frequency	Percentage
Age group (years)		
60-69	262	59.54
70-79	129	29.32
≥80	49	11.14
Sex		
Male	187	42.5
Female	253	57.5
Marital status		
Married	263	59.77
Widowed	177	40.23
Type of family		
Joint	407	92.5
Nuclear	33	7.5
Literacy status		
Illiterate	264	60.0
Primary	56	12.73
Middle	29	6.59
High School	46	10.45
Intermediate	26	5.91
Graduate and above	19	4.32
Occupation		
Employed	94	21.36
Not employed	346	78.64
Socioeconomic status		
Class I	01	0.25
Class II	46	10.45
Class III	260	59.09
Class IV	95	21.59
Class V	38	8.64

Overall 51.36% of the elderly were non vegetarian. The difference in dietary habits of male and female elderly was found statistically significant (χ^2 =21.4, p=0.001) (Table 2).

Majority (51.82%) of the elderly were found to have their BMI in normal range. However, number of elderly females was both underweight and obese more than that of males. This difference in BMI of elderly males and

females were found statistically significant (χ^2 = 10.0, p=0.019) (Table 3).

Table 2: Distribution of elderly according to dietary habits.

Dietary Ma		es	Females		Total	
habits	No	%	No	%	No	%
Vegetarian	67	35.83	147	58.11	214	48.64
Non vegetarian	120	64.17	106	41.89	226	51.36
Total	187	100.00	253	100.00	440	100.00

 $(x^2=21.4, p=0.001)$

Table 3: Distribution of elderly according to Body Mass Index (BMI) and sex.

BMI Males (kg/m²) No. %		Females		Total	
No.	%	No.	%	No.	%
37	19.79	76	30.04	113	25.68
111	59.36	117	46.25	228	51.82
34	18.18	46	18.18	80	18.18
05	2.67	14	5.53	19	4.32
187	100.00	253	100.00	440	100.00
	37 111 34 05	37 19.79 111 59.36 34 18.18 05 2.67 187 100.00	37 19.79 76 111 59.36 117 34 18.18 46 05 2.67 14 187 100.00 253	37 19.79 76 30.04 111 59.36 117 46.25 34 18.18 46 18.18 05 2.67 14 5.53 187 100.00 253 100.00	37 19.79 76 30.04 113 111 59.36 117 46.25 228 34 18.18 46 18.18 80 05 2.67 14 5.53 19 187 100.00 253 100.00 440

 $(\chi^2 = 10.0, p = 0.019)$

There is decrease in trend of BMI with increase in age and this was found statistically significant (χ^2 =13.6, p=0.034) (Table 4).

Table 4: Distribution of elderly according to Body Mass Index (BMI) and age.

BMI	60-69 years		70-79 years		≥80 years	
(kg/m^2)	No.	(%)	No.	(%)	No.	(%)
<18.5	54	20.61	41	31.78	18	36.73
18.5-						
24.99	140	53.43	62	48.06	26	53.06
25-						
29.99	53	20.23	23	17.83	04	8.16
≥30	15	5.73	03	2.33	01	2.04
Total	262	100.00	129	100.00	49	100.00

 $(x^2=13.6, p=0.034)$

DISCUSSION

A total of 440 elderly of age 60 years and above were studied. Age group 60-69 years constituted the majority of study subjects (59.54%), followed by 70-79 years (29.32%) and 80 years and above (11.14%). Similar finding was confirmed by other observers in their studies. 5-15

In the present study, sex distribution shows that females (57.5%) outnumbered the males (43.5%). The other researchers confirmed the similar finding whereas Shankar R et al, Narapureddy B et al, Kumar R et al and

Lahiri S et al found in their studies that number of males were more than that of females. 5-14,16-18

The marital status of the elderly shows that 59.77% were married and 40.23% were widowed. This finding was comparable to that of a report published by United Nation Population Fund (UNFPA), where about 60% of the elderly were currently married and 38% widowed. Mohapatra SC et al, Mishra CP et al, Kritika et al, Narapureddy B et al, Kumar R et al and Lahiri S et al confirmed the same. ^{5,7,12,13,17-19}

Most (92.5%) of the elderly lives in a joint family and similar observation were made by Mishra CP et al and Shankar R et al while Tirkey K et al and Kumar R et al found mostly elderly were living in nuclear families. ^{7,11,15,17}

Majority of the elderly were illiterates (60%) in present study. Similar observation was made in the studies conducted by various researchers while Lahiri S et al found only 7.7% of the elderly as illiterate in her study. 5-8,11-15,17,18

It was found that about 78.64% were not working. Similar finding was observed by Mishra CP et al and Kritika et al.^{7,12}

Majority of the elderly belonged to class III (59.09%) in the present study. Similar finding was reported by Lahiri S et al whereas in studies done by Mohapatra SC et al, Mishra CP et al, Shankar R et al, Kritika et al, Chauhan P et al and Kumar R et al most of the elderly belongs to low socioeconomic status. 5,7,11,12,14,17,18

In present study, 48.64% of elderly were vegetarian while 51.36% were non vegetarian.

Narapureddy B et al also confirmed the same finding in his study where 48.4% were vegetarians while 42.5% were occasional non-vegetarians and 9.1% were regular non-vegetarians by diet. Tirkey K et al and Goel PK et al in their study reported that more number of elderly were vegetarian by diet as 60.67% and 81.2% respectively. The same finding in his study were vegetarian by diet as 60.67% and 81.2% respectively.

In present study, 51.82% of elderly were having BMI within normal range while 25.68% of elderly were underweight followed by 18.18% overweight and 4.32% obese.

Kalia M et al, Prasad KN et al, Kritika, Chauhan P et al, Goel PK et al, Kumar R et al in their study observed that most of the elderly were in normal range of BMI. 8,10,12,14,16,17

Mohapatra SC et al, Mishra CP et al, Shankar R et al, Tirkey K et al reported majority of elderly being underweight, ranging from 42.9% to 88.67%. 5,7,11,15

The prevalence of overweight range from 9.6% in Goel PK et al to 24.38% in Kalia M et al. while obesity varies from as low as 2.3 % reported by Kumar R et al to 25.2% by Chauhan P et al. 8,14,16,17

There was significant difference BMI of male and female elderly (χ^2 =10.0, p=0.019) in our study. Similar findings were observed by Kalia M et al and Katta A et al while Tiwari S et al, Mishra CP et al and Kumar R et al observed no significant difference in their study.

In this study, with increase in age decrease in trend of BMI was observed and this difference was statistically significant. Similar findings were confirmed by Kalia M et al, Katta A et al and Shankar R et al while Mishra CP et al observed no significant difference in their study.^{7-9,11}

CONCLUSION

Most of the elderly are in normal range of BMI in this study but still if we consider the age of elderly and the cut off consider for Asian people more might have been in the overweight and obese group. As we know many chronic diseases like hypertension, diabetes, certain cancers etc. are related to weight of an individual, this should be keep in check by lifestyle modification. Underweight elderly are also at risk, being having low immunity can fall ill easily. The nutritional assessment of elderly can be done by various measures and it should be incorporated while studying the overall health status of elderly.

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