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PREVALENCE AND CORRELATES OF MALNUTRITION AMONG ELDERLY IN A RURAL AREA OF DELHI

Community Medicine

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ABSTRACT

Background- The World Health Organization (WHO) has stated that aging populations will present new challenges to health care. Older persons are particularly vulnerable to malnutrition. Moreover, attempts to provide them with adequate nutrition encounter many practical problems. **Objectives-** The aim of this study is to estimate the prevalence and correlates of malnutrition among elderly aged 60 years and above in a rural area in Delhi. **Materials &Methods-** A community based cross sectional study was conducted on the elderly population aged 60 years and above and 205 elderly were included in the study. **Results-** Majority of the study participants were in the age group of 60 to < 65 years (46.8%) followed by 65 to <70 years (26.8%) followed by 85 -90 years (10.2%). More than half of them were females (57.5%). Almost half of the study subjects (47.8%) had MUAC of less than 21 and 10.2% had MUAC of more than 22 cm. According to Mini Nutritional Assessment (MNA) score, out of the total participants, 83(40.5%) of the study subjects were malnourished while 84(41%) of the study population were at risk of malnutrition. **Conclusion-** The present study showed that there was high prevalence of malnutrition among the study subjects and most subjects were at risk of malnutrition. The findings of the present study clearly indicates that malnutrition is a multifactorial condition associated with socio-demographic, somatic, and functional status. Hence, we recommend that the treatment of malnutrition should be multifactorial, and the treatment team should be multidisciplinary.

KEYWORDS

Elderly, Rural, Mini Nutritional assessment

INTRODUCTION

The World Health Organization (WHO) has stated that aging populations will present new challenges to health care. The health of elderly is an important issue defining the health status of the population[1]. In India, geriatric age group (aged 60 years and above) constitute 8.6% of the total population of the elderly in India as per 2011 census[2]. People aged 60 and older make up 12.3% of the global population, and by 2050, that number will rise to almost 22 per cent[3].

There is no gold standard for estimating malnutrition among the elderly. Body mass index (BMI; weight [kg]/height [m [2]]) predicts disease risk both in those termed underweight and in those who are obese. The WHO categorizes underweight as BMI <18.5, normal 18.5-24.9, overweight 25-29.9, obese 30-30.99, and extreme obesity >40. However, merely taking BMI may be unreliable in the presence of confounding factors, which may be edema or ascites and may not identify significant unintentional weight loss.[4]

The Mini Nutritional Assessment (MNA) scale [5] was developed to diagnose the risk of malnutrition in elderly people. The objective of this scale is to provide a simple and quick evaluation of the nutritional state of the elderly people who are in hospital, in geriatric institutions or in the community. It is an 18 –item validated nutritional screening instrument that has a sensitivity of 54%-90% when compared with a detailed nutritional assessment[6]. It is simple and non-invasive, which facilitates its use in the community

Methodology

The study was a Community based cross sectional study carried out in Barwala village situated in the Narela Tehsil of Northwest district of the National Capital Territory of Delhi. The elderly population aged 60 years and above of Barwala were included. House wise listing of study subjects was done by house to house visit. The eligible study participants were selected by using the simple random sampling method. 205 subjects responded till the end of study and were included in the final analysis.

Nutritional status was assessed with the existing Mini Nutritional Assessment (MNA) questionnaire for assessing the nutritional status of study subjects. It was translated in a local language for the convenience of the study participants. Data pertaining to demography, socioeconomic status, education, occupation status, and family was obtained.

Factors associated with malnutrition included Lifestyle factors (alcohol consumption and smoking habits were asked), Somatic factors (medication use, any comorbidity, use of any walking aid), Functional Factors (ADL and IADL) and Economic Factors (Classified on the basis of Modified BG Prasad's classification).

Other variables included height (that was measured with a measuring tape to the nearest centimeter), weight was assessed with a digital weighing machine to the nearest kilogram.

RESULTS

Table 1 shows distribution of study subjects according to their demographic characteristics. Majority of them were in the age group of 60 to 70 years (73.6%) followed by 80 to 90 years (13.7%) and least were in age group of 70-80 years (12.7%) Almost more than half of them were females (57.5%). with regard to religion, majority were Hindu 79% followed by Muslim who constituted 15%. Of the study subjects majority (58.5%) had a joint or a three generation family, only 41.5% were nuclear family or were living independently. On observing with regard to socio economic status by Modified BG Prasad scale it was observed majority belonged to class III followed by class IV and only 0.5% belonged to class V. Considering the education majority 40% were illiterate and 30.7% were Primary class educated Graduate and post graduate constituted roughly 12 % of total. With regard to occupation, nearly half of study subjects were either unemployed or homemakers, one fifth were skilled workers followed by 15% semi-skilled worker. Professional were mere 4% of total.

Table 1- Demographic Characteristics Of The Study Subjects. (N=205)

Characteristic	Group	Sub-Group	No. (%)
Demographic characteristics	Age group	60 – 70	151 (73.6)
		70 – 80	26 (12.7)
		80 – 90	28 (13.7)
	Gender	Male	87 (42.4%)
		Female	118 (57.6%)
	Religion	Hindu	162(79%)
		Muslims	32(15.6%)
		Others	11(5.4%)
	Type of Family	Joint & Three Generation	120(58.5%)
		Nuclear or Living Independently	85(41.5%)
	Socio economic status using BG Prasad Scale	Class I	6 (2.9)
		Class II	28 (13.7)
		Class III	112 (54.6)
		Class IV	58 (28.3)
		Class V	1(0.5)

	Education Status	Illiterate	82 (40.0)
		Primary	63 (30.7)
		12th pass	36 (17.6)
		Graduate & Post graduate	24(11.7)
	Occupation	Unemployed/House wife	102(49.7)
		Unskilled	16(7.9)
		Semi-Skilled	30 (14.6)
		Skilled	42(20.4)
		Semi Professional	7 (3.5)
		Professional	8 (3.9)

Figure 1 shows the distribution of study subjects according to Mini Nutritional Assessment (MNA) score. It shows that out of total, 83(40.5%) of the study subjects were malnourished while 84(41%) of the study population were at risk of malnutrition and 38(19%) of them were normal.

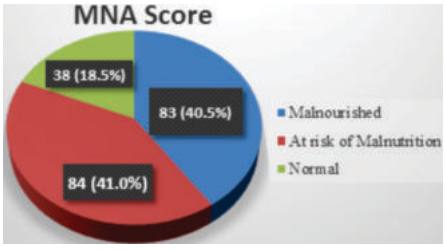

Figure 1. Distribution of Study Subjects according to Mini Nutritional Assessment (MNA) Score. (N=205)

Considering the life style and functional characteristics as seen in Table No-2, on using chi-square test it was observed that among the life style characteristics considered Alcohol intake and Exercise per week and among the functional characteristics IADL, were significantly different among the participants classified according to nutritional status using MNA Score. On applying multinomial logistic regression model, it was observed that only alcohol intake was significant when comparing the Malnourished to normal individuals based on MNA scores. Table 2 shows the association of lifestyle characteristics in relation to malnutrition. It was observed that 42.2% of the study subjects who were current smokers were malnourished.51.8% of the subjects were malnourished who never had alcohol followed by 28.9% who were currently consuming alcohol. Those who were not doing any exercise were malnourished (92.8%) and 82.1% were at risk of malnutrition. There was a statistically significant association between malnutrition and exercise done by the study subjects (p=0.033), alcohol intake (p=0.001) and oral hygiene (p=0.050).On applying multinomial logistic regression model, it was observed that only alcohol intake was significant when comparing the Malnourished to normal individuals based on MNA scores.

Table 2: Malnutrition In Relation To Lifestyle Characteristics. (N=205)

Characteristics		Malnourished	At Risk of Malnutrition	Normal	Total	Unadjusted p value	Malnourished Vs Normal		At Risk of Malnutrition Vs Normal	
Lifestyle		No. (%)	No. (%)	No. (%)	No. (%)		Adjusted Odds ratio	p value	Adjusted Odds ratio	p value
Smoking	Current	35 (42.2)	38 (45.2)	14 (36.8)	88 (42.9)	0.762				
	Never	23 (27.7)	25 (29.8)	9 (23.7)	57 (27.8)					
	Past	25 (30.1)	21 (25.0)	14 (36.8)	60 (29.3)					
Alcohol	Current	24 (28.9)	17 (20.2)	15 (39.5)	56 (27.3)	0.035(s)	2.4	0.061	6.5	0.001
	Never	43 (51.8)	48 (57.1)	23 (60.5)	114 (55.6)		7.2	<0.001(s)	4	0.145
	Past	16 (19.3)	19 (22.6)	0 (0.0)	35 (17.1)		1.0(ref.)	-	1.0(ref.)	-
Exercise Per Week at least 30 min/day	Not Done	77 (92.8)	69 (82.1)	29 (76.3)	175 (85.4)	0.033(s)	3.7	0.221	2.2	0.59
	3- 4 Days	6 (7.2)	15 (17.9)	9 (23.7)	30 (14.6)		1.0(ref.)	-	1.0(ref.)	-
Sleeping Duration	Adequate	28 (33.7)	34 (40.5)	15 (39.5)	77 (37.6)	0.643				
	Inadequate	55 (66.3)	50 (59.5)	23 (60.5)	128 (62.4)					
Oral Hygiene	Satisfactory	46 (55.4)	59 (70.2)	19 (50.0)	124 (60.5)	0.050	1.8	0.968	4.6	0.968
	Unsatisfactory	37 (44.6)	25 (29.8)	19 (50.0)	81 (39.5)		1.0(ref.)	-	1.0(ref.)	-
Functional		No. (%)	No. (%)	No. (%)	No. (%)	Unadjusted p value				
ADL	Independent	76 (91.6)	74 (88.1)	32 (84.2)	182 (88.8)	0.476				
	Dependent	7 (8.4)	10 (11.9)	6 (15.8)	23 (11.2)					
IADL	Independent	27 (32.5)	23 (27.4)	20 (52.6)	70 (34.1)	0.023(s)	0.4	0.969	3.4	0.95
	Dependent	56 (67.5)	61 (72.6)	18 (47.4)	135 (65.9)		1.0(ref.)	-	1.0(ref.)	-

Table 3 shows the General Assessment of the study subjects.(N=205), on using chi-square test. There was a statistically significant association between malnutrition and Stress or Acute Diseases in The Past 3 Months (p< 0.001), Neuropsychological Problems(p< 0.001) and Mobility(p< 0.001). On applying multinomial logistic regression model, it was observed that presence of mild dementia among the Neuropsychological Problems was significantly associated, when comparing the Malnourished to normal individuals based on MNA scores. Similarly using the regression model when comparing At risk of malnutrition Vs Normal group, the presence of Stress or Acute Diseases in The Past 3 Months and Mild dementia among the Neuropsychological Problems had significantly higher Odds of At-risk of Malnutrition than normal nutrition. Considering the Dietary Assessment, on using chi-square test it was observed that All parameters considered in diet were significantly associated with the MNA Score. However, on applying multinomial logistic regression model, it was observed that 1 or 2 meals (lesser number of meals), presence of appetite loss, and less than 5 cups of fluid intake had significantly higher odds of malnutrition or at risk of malnutrition when compared to normal individuals based on MNA scores.

DISCUSSION

Sociodemo Graphic Factors

Divyae Kansal et al. and Anuj Bishnoi et al. reported the similar prevalence of malnutrition among females than males which is similar to the present study.7,8 This could be attributed to traditional habits of eating after children, practice of sharing among family members that could result in malnutrition. Surajit Lahiri et al.9 and Joymati O. et al.10 reported that Females were significantly more malnourished than males whereas no significant statistical association found between malnutrition and socio demographic characteristics in the present study.

Lifestyle Characteristics

Mathew A.C et al.11 reported no statistically significant association between smoking, current alcohol consumption but in the present study those who never had consumed alcohol were found to be malnourished. Renata DamiãoI et al.12 showed that smokers were also more likely to be at risk of malnutrition which is similar to the present study. Marian A.E. et al.13 reported that being IADL dependent was independently associated with an increased risk of malnutrition which is similar to present study.

General Assessment

There was significant statistical association between malnutrition and Neuropsychological factors and stress/ acute disease in past 3 months in the present study which is similar to study conducted by Santanu Saha et al.14 and Marian A.E et al.13

MNA Score

In the present study, according to MNA score, the prevalence of malnutrition among elderly was found to be 40.5% and those at risk of malnutrition were 41% which is similar to a study conducted by Son Nazan et al.15

Table No-3 General Assessment of the Study Participant (N=205)

General Assessment		Malnourished	At risk of malnutrition	Normal	Total	Unadjusted p value	Malnourished Vs Normal		At Risk of Malnutrition Vs Normal	
		No. (%)	No. (%)	No. (%)	No. (%)		Adjusted Odds ratio	p value	Adjusted Odds ratio	p value
Stress or Acute Diseases in The Past 3 Months	Yes	49 (59.0)	38 (42.9)	2 (5.3)	87 (42.4)	< 0.001	6.1	0.19	196	0.04
	No	34 (41.0)	48 (57.1)	36 (94.7)	118 (57.6)		1.0(ref.)	-	1.0(ref.)	-
Neuropsychological Problems	Severe Dementia	15 (18.1)	2 (2.4)	1 (2.6)	18 (8.8)	< 0.001	4.8	0.64	9	0.97
	Mild Dementia	44 (53.0)	39 (46.4)	3 (7.9)	86 (42.01)		4.9	0.01	3.6	0.04
	No Problems	24 (28.9)	43 (51.2)	34 (89.5)	101 (49.3)		1.0(ref.)	-	1.0(ref.)	
Mobility	Bed or Chair Bound	8 (9.6)	8 (9.5)	4 (10.5)	20 (9.8)	< 0.001	2.3	0.78	1.2	0.95
	Able to Get Out of Bed but Does Not Go Out	44 (53.0)	25 (29.8)	1 (2.6)	70 (34.1)		5.9	0.45	3.6	0.57
	Goes Out	31 (37.3)	52 (60.7)	33 (86.8)	115 (56.1)		1.0(ref.)	-	1.0(ref.)	
Dietary assessment		No. (%)	No. (%)	No. (%)	No. (%)	Unadjusted p value	Adjusted Odds ratio	p value	Adjusted Odds ratio	p value
No. of Meals	1or 2Meals	82 (98.8)	61 (72.6)	4 (10.5)	147 (71.7)	<0.001 (s)	8.2	<0.001(s)	4.9	0.001(s)
	3 Meals	1 (1.2)	23 (27.4)	34 (89.5)	58 (28.3)		1.0(ref.)	-	1.0(ref.)	-
Two or More Servings Fruits/Vegetables Per Day	No	12 (14.5)	8 (9.5)	0 (0.0)	20 (9.8)	0.045(s)				
	Yes	71 (85.5)	76 (90.5)	38 (100.0)	185 (90.2)					
Appetite Loss	Loss	79 (49.4)	69 (43.1)	12 (7.5)	160 (78)	<0.001 (s)	23	0.04(s)	21	0.03(s)
	No Loss	4 (8.9)	15 (33.3)	26 (57.8)	45 (22)		1.0(ref.)	-	1.0(ref.)	
Fluids Per Day (Water, Juice, Tea and Milk)	<5 cups	82 (98.8)	52 (61.9)	5 (13.2)	139 (67.8)	<0.001 (s)	8.3	<0.001(s)	4	<0.001(s)
	>5 cup	1 (1.2)	32 (38.1)	33 (86.8)	66 (32.2)		1.0(ref.)	-	1.0(ref.)	-
Mode of feeding	With some difficulty	45 (54.2)	31 (36.9)	1 (2.6)	77 (37.6)	<0.001 (s)				
	Without difficulty	38 (45.8)	53 (63.1)	37 (97.4)	128 (62.4)					

CONCLUSION

The present study showed that there was high prevalence of malnutrition among the study subjects and most subjects were at risk of malnutrition. The findings of the study indicate that malnutrition is a multifactorial condition and was associated with one or more of the following statuses- socio-demographic, somatic and the functional status. The subjects that were not exercising were more likely to be malnourished as compared to those who were regularly exercising at-least 3-4 days per week. Among functional factors, those who were ADL independent and IADL dependent were more malnourished.

The recommendations given at the end of the study included- Screening of elderly to be done with simple measures such as MNA (Mini Nutritional Assessment) questionnaire for early detection of malnutrition, similarly mid upper arm circumference, calf circumference can be used to detect malnutrition. Periodic health education is to be given to prevent Malnutrition. The study findings

suggests that the screening of elderly to be done with simple measures such as MNA (Mini Nutritional Assessment) questionnaire for early detection of malnutrition, similarly mid upper arm circumference, calf circumference can be used to detect malnutrition. Periodic health education is to be given to prevent Malnutrition

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