A Study on the Assessment of Nutritional Status among Geriatric Population in Jamnagar City

Suraj Khandhedia[1], Sumit Unadkat[2], Dipesh Parmar[3]

[1]Tutor, Community Medicine Department, GMERS Medical College, Dharpur-Patan
[2]Associate Professor, [3] Professor and Head, Community Medicine Department, M. P. Shah Medical College, Jamnagar
Correspondence: Dr. Suraj Khandhedia, E mail:surajkhandhedia@gmail.com

Abstract :

   Introduction : Aging is a natural process. The effect of nutritional status on physical and psychological well being is especially high in elderly. The nutritional status and needs of elderly people are associated with age-related biological and often socioeconomic changes. A comprehensive tool specifically developed for use with elderly people is the Mini-Nutritional Assessment (MNA). **Objectives:** 1) To assess the nutritional status of elderly by use of MNA (Mini Nutritional Assessment) tool. 2) To compare the MNA score (Nutritional status) with different socio demographic variables. **Method :** This was a cross sectional descriptive study to assess the nutritional and status among geriatric population(Aged ≥ 60 years) in an urban area. The study was carried out from January 2012 to December 2012 with sample size of 400. **Results :** Out of total 400 elderly subjects, almost two-third had normal nutritional status while 30.25% were at risk of malnutrition and only 6.75% were malnourished according to MNA score. There was a significantly high proportion of elderly with chronic morbidity was malnourished (11.79%) and at risk of malnutrition (37.44%). **Conclusion :** Prevalence of malnutrition and at risk of malnutrition was significantly higher in retired, illiterate and economically dependent elderly. Management of malnutrition in the elderly population requires the involvement of multiple disciplines for its diagnosis and treatment.

Key Words : Nutritional status, MNA (Mini Nutritional Assessment) score, Geriatric population,

Introduction :

   Aging is a natural process. [1] Old age should be regarded as a normal, inevitable biological phenomenon. [2] The population over the age of 60 years has tripled in last 50 years in India and will relentlessly increase in near future. In 2001, the proportion of older people was 7.7% which will increase to 8.94% in 2016.[3] The effect of nutritional status on physical and psychological well being is especially high in elderly.[4] The nutritional status and needs of elderly people are associated with age-related biological and often socioeconomic changes.[5] Malnutrition leads to dependency; dependency interferes with the health and quality of life, not only for the elderly, but also for relatives and health-care providers.[6]

   A comprehensive tool specifically developed for use with elderly people is the Mini-Nutritional Assessment (MNA): this is a rapid and simple tool for evaluating the nutritional state of the frail elderly, which allows, if necessary, for nutritional intervention and/or diet modification. [7]Therefore, the present study was carried out to assess the nutritional status of elderly and to compare the MNA score (Nutritional status) with different socio demographic variables.

Method :

   This was a cross sectional descriptive study to assess the nutritional and status among geriatric population in an urban area (non-slum and slum). The study was carried out from January 2012 to December 2012. It is a cross sectional study so for estimating a population proportion with specified relation precision, [8] formula is

$$N = Z^2_{1-\alpha/2}P(1-P)/\varepsilon^2$$

In this,

N=Sample size

1-α = confidence level

$Z_{1-\alpha/2}$ = Represent the number of standard errors from the mean (Z_1-α/2 is function of confidence level).

P= anticipated population proportion

ε= Relating precision.

Since P value from previous studies on the topic of present study is not available an anticipated P value should be taken as 50%. At p= 0.50 (50%) & ε = 10%, a sample size of 384 would be needed.[8] To make a round figure sample size has been taken 400 instead of 384. There are 19 wards and 64 slum pockets in this Municipal Corporation area. By simple random sampling ward no. 3, 6, 9 and 13 were chosen for study. From each ward 100 subjects were studied by simple random sampling. Out of 100, 50 were taken from the non-slum areas and 50 were taken from the slum areas.

Pre-tested and semi-structured questionnaire was used for collecting data. The study subjects were interviewed through house to house visits. Informed consent was taken from the participants by initially explaining the purpose of the study and knowing their willingness to share the information. The data were entered in the computer, using the Microsoft office excel 2007. Analysis was also done using the epi-info software and chi-squaretest and logistic regression tests were applied. Ethical approval was taken before the commencement of the study from the ethical committee of the concerned institution.

Economic dependent can be defined as, those who were economically dependent on others and they didn't have any personal income source. Chronic morbidity can be defined as, any deviation from normal health for long period of time.

MNA (Mini Nutritional Assessment)

The MNA is a very simple non-invasive, easy to administer, patient-friendly, non-expensive, very sensitive, highly specific, reliable and validated screening tool for malnutrition in the elderly.[9, 10]

Interpretation of scores is done as follows:

Score <17   :   Malnourished
Score 17-23.5   :   At risk of malnutrition
Score >23.5   :   Normal nutritional status

Exclusion criteria :

- Bed ridden elderly people

- Mentally unstable elderly people

Mini Nutritional Assessment

Screening	
A	Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties? 0 = severe decrease in food intake 1 = moderate decrease in food intake 2 = no decrease in food intake
B	Weight loss during the last 3 months 0 = weight loss greater than 3kg (6.6lbs) 1 = does not know 2 = weight loss between 1 and 3kg (2.2 and 6.6 lbs) 3 = no weight loss
C	Mobility 0 = bed or chair bound 1 = able to get out of bed / chair but does not go out 2 = goes out
D	Has suffered psychological stress or acute disease in the past 3 months? 0 = yes 2 = no
E	Neuropsychological problems 0 = severe dementia or depression 1 = mild dementia 2 = no psychological problems

J How many full meals does the patient eat daily?
0 = 1 meal
1 = 2 meals
2 = 3 meals □

K Selected consumption markers for protein intake
• At least one serving of dairy products (milk, cheese, yoghurt) per day   yes □   no □
• Two or more servings of legumes or eggs per week   yes □   no □
• Meat, fish or poultry every day   yes. □   no □
0.0 = if 0 or 1 yes
0.5 = if 2 yes
1.0 = if 3 yes   □ . □

L Consumes two or more servings of fruit or vegetables per day?
0 = no   1 = yes   □

M How much fluid (water, juice, coffee, tea, milk...) is consumed per day?
0.0 = less than 3 cups
0.5 = 3 to 5 cups
1.0 = more than 5 cups   □ . □

N Mode of feeding
0 = unable to eat without assistance
1 = self-fed with some difficulty
2 = self-fed without any problem   □

F Body Mass Index (BMI) (weight in kg) / (height in m²)
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater

Screening score
(subtotal max. 14 points)

12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished

For a more in-depth assessment, continue with questions G-R

Assessment

G Lives independently (not in nursing home or hospital)
1 = yes   0 = no
H Takes more than 3 prescription drugs per day
0 = yes   1 = no
I Pressure sores or skin ulcers
0 = yes   1 = no

O Self view of nutritional status
0 = views self as being malnourished
1 = is uncertain of nutritional state
2 = views self as having no nutritional problem
P In comparison with other people of the same age, how does the patient consider his / her health status?
0.0 = not as good
0.5 = does not know
1.0 = as good
2.0 = better
Q Mid-arm circumference (MAC) in cm
0.0 = MAC less than 21
0.5 = MAC 21 to 22
1.0 = MAC 22 or greater
R Calf circumference (CC) in cm
0 = CC less than 31
1 = CC 31 or greater

Assessment (max. 16 points)

Screening score

Total Assessment (max. 30 points)

Results :

The study was conducted with 400 elderly people (Aged ≥ 60 years). Out of total 400 elderly subjects, almost two-third had normal nutritional status while 30.25% were at risk of malnutrition and only 6.75% were malnourished according to MNA score. The findings were comparable among urban non-slum area and urban slum area. (Table 1)

Table 1: Nutritional status of the study subjects according to Mini Nutritional Assessment (MNA) score

Nutritional status (Score)	Urban area				Total	
	Non-slum		Slum			
	No.	%	No.	%	No.	%
Well nourished (24-30)	123	61.5	129	64.5	252	63
At risk of malnutrition (17-23.5)	67	33.5	54	27	121	30.25
Malnourished (<17)	10	5	17	8.5	27	6.75
Total	200	100	200	100	400	100

χ^2=3.35, df=2, p=0.187

Nearly one third of the elderly (29.51%) aged ≥ 75 years were found malnourished while more than half of them (57.38%) were at risk of malnutrition. In the age group of 60-74 years, only 2.65% elderly were malnourished. It is evident that as the age increases, malnutrition and risk of malnutrition increases. The statistical analysis did not show any significant difference between elderly males and females with respect to MNA scores. Out of the total illiterate elderly, 38.54% were well nourished and 37.5% were at risk of malnutrition according to MNA score. The statistically significant association was found between economic dependency status and nutritional status of elderly. Proportion of malnutrition was high among the elderly living in the three generation family where as high proportion of well nourished elderly was observed in those living in the joint family followed by those in nuclear family. Prevalence of malnutrition and at risk of malnutrition was significantly higher in retired elderly in comparison to persons who were working (Table 2).

Table 2: Association between nutritional status and socio demographic variables

Socio demographic variables		Nutritional Status						Total n=400		p value
		Malnourished n=27		At risk of malnutrition n=121		Well nourished n=252				
		No.	%	No.	%	No.	%	No.	%	
Age (years)	60-74	9	2.65	86	25.37	244	71.98	339	100	<0.001
	≥75	18	29.51	35	57.38	8	13.11	61	100	
Gender	Male	19	9.27	56	27.32	130	63.41	205	100	0.076
	Female	8	4.10	65	33.33	122	62.57	195	100	
Literacy-status	Illiterate	23	23.96	36	37.5	37	38.54	96	100	<0.001
	Literate	4	1.32	85	27.96	215	70.72	304	100	
Economic dependency status	Dependent	25	8.33	107	35.67	168	56	300	100	<0.001
	Independent	2	2	14	14	84	84	100	100	
Type of family	Nuclear	4	2.44	50	30.49	110	67.07	164	100	0.015
	Joint	0	0	13	13.54	83	86.46	96	100	
	Three generation	23	16.43	58	41.43	59	42.14	140	100	
Occupation	Retired	25	13.09	95	49.74	71	37.17	191	100	<0.001
	Working	2	0.96	26	12.44	181	86.60	209	100	

Table 3: Association between nutritional status and chronic morbidity status

Chronic morbidity	Nutritional Status						Total	
	Malnourished		At risk of malnutrition		Well nourished			
	No.	%	No.	%	No.	%	No.	%
Present	23	11.79	73	37.44	99	50.77	195	100
Absent	4	1.95	48	23.42	153	74.63	205	100
Total	27	6.75	121	30.25	252	63	400	100

χ^2=29.88, df=2, p<0.001

Table 4: Application of logistic regression between nutritional status (MNA score) and socio-demographic variables.

Term	Odds Ratio	95% Confidence interval	Coefficient	Standard Error	Z-Statistics	P-Value
Age	12.4511	5.5916 - 27.7255	2.5218	0.4084	6.1741	0.0001
Chronic morbidity	1.6889	1.0465 - 2.7256	0.5241	0.2442	2.1462	0.0319
Economic dependency status	3.5638	1.8102 - 7.0159	1.2708	0.3456	3.6771	0.0002
Gender	0.6773	0.4068 - 1.1276	-0.3897	0.2601	-1.4983	0.1340

Significantly higher proportions of elderly with chronic morbidity were malnourished (11.79%) and at risk of malnutrition (37.44%) as compared to those without chronic morbidity (1.95% and 23.42% respectively) (Table 3).

On applying logistic regression, there was significant association between nutritional status and age, chronic morbidity and economic dependency status while no association was found between nutritional status and gender (Table 4).

Discussion :

In the present study almost two-third had normal nutritional status while 30.25% were at risk of malnutrition and only 6.75% were malnourished according to MNA score. The findings of higher percentage of elderly population at risk of malnutrition corroborate with the study of Bewaja S et al [4] performed in Western Rajasthan and Yadav N et al [11] performed in urban area of Allahabad district while both study reported lower percentage of elderly with normal nutritional status. Bewaja S et al [4] found in their study that, 7.1% elderly were malnourished which is almost similar to the findings of the present study while higher percentage of malnourished (24.97%) was observed in the study done by Yadav N et al [11]. Sharma R [12] in her study found that age of elderly correlated significantly and negatively with the MNA scores which was similar to the findings of present study.

Similar to the present study, Yadav N et al [11] and Sharma R [12] also found that relationship of MNA score (nutritional status) with education was positive and significant. Contradictory to the findings of the present study, Sharma R[12] in her study noted that MNA scores correlated negatively and insignificantly with the type of family.

In the present study, it was found that prevalence of malnutrition and at risk of malnutrition was significantly higher in retired elderly in comparison to persons who were working. Aliabadi M et al [13] also found that the nutritional status was significantly associated with occupation. While Sharma R[12] in her study noted that MNA scores showed a positive but insignificant relationship with the employment status. In the study done by Pai M K[7], it was found that the nutritional status was independent of associated co-morbid illness. Study results showed that 28.6% elders with co morbid illness and 17% without co-morbid illness were malnourished and at risk of malnutrition while 71.4% elderly with co-morbid illness and 83% without co-morbid illness were well nourished.

Conclusion :

There is high proportion of elderly people who are malnourished or at risk of malnutrition. Management of malnutrition in the elderly population requires the involvement of multiple disciplines and regular follow up for its diagnosis and treatment. Nutritional assessment and screening of elderly people should be done periodically with simple measures such as, the MNA (Mini Nutritional Assessment) tool, for early detection of malnutrition and to implement an appropriate nutritional intervention.

References :

1. Global Health and Aging – WHO, National Institute on Aging, National Institute of Health, U.S.Department of Health and Services. NIH Publication. October 2011.

2. K.Park. Textbook of Preventive and Social Medicine, Jabalpur, Bhanot Publisher, 22nd edition. 2013.

3. Operational Guidelines - National Progamme For The Health Care Of The Elderly. Minstry Of Health and Family Welfare Department - Govt Of India.

4. Baweja S, Agarwal H,Mathur A, Haldiya K R. Assessment of nutritional status and related risk factors in the community dwelling elderly in western Rajasthan. Journal of Indian Academy of Geriatrics. 2008; 1.

5. Meydani M. Nutrition Interventions in Aging and Age-Associated Disease. Ann N Y Acad Sci. 2006.

6. Andre M B, Dumavibhat N, Ngatu N R, Eitoku M, Hirota R and Suganuma N. Mini Nutritional Assessment and functional capacity in community-dwelling elderly in Rural Luozi, Democratic Republic of Cong, Japan. Geriatrics & Gerontology International. 2013.

7. Pai M K. Comparative study of nutritional status of elderly population living in the home for aged vs those living in the community. Biomedical Research. 2011; 22 (1).

8. S.K.Lwanga, S.Lemeshow. Sample size determination in health studies, Practical manual. Geneva : World Health Organization. 1991.

9. Vellas B, Guigoz Y, Baumgartner R, Garry PJ, Lauque S, Albarede JL. Relationships between nutritional markers and the Mini-Nutritional-Assessment in 155 older persons. J Am Geriatr Soc. 2000; 48.

10. Van Nes MC, Herrmann FR, Gold G, Michel JP, Rizzoli R. Does the mini nutritional assessment predict hospitalization outcomes in older people? Age Ageing 2001; 30.

11. Yadav N, Ravindra R, Sharma S, Singh A, Mishra M, Dubey J, et al. Dietry habits and nutritional status of elderly living in urban areas of Allahabad district. Indian J.Prev.Soc.Med. 2012; 43 (1).

12. Sharma R. Relationship between Mini Nutritional Assessment Scores and Socioeconomic Status of the Elderly. Journal of Community Nutrition & Health. 2012; 1(2).

13. Aliabadi M, Kimiagar M, Ghayour-Mobarhan M, Shakeri MT, Nematy M, Ilaty AA, et al. Prevalence of malnutrition in free living elderly people in Iran: a cross-sectional study. Asia Pac J Clin Nutr. 2008; 17(2): 285-9.