

Research Article

# Assessment of Association between Health and Nutritional Status of Geriatric Population in the Rural Area of Western Maharashtra, India

*Badrinarayan Mishra<sup>1</sup>, Rohit Avinash Vadgaonkar<sup>2</sup>*

<sup>1</sup>Professor, Dept. of Community Medicine, Ruxmaniben Deepchand Gardi Medical College, Ujjain, Madhya Pradesh, India.

<sup>2</sup>Ex. Intern, Rural Medical College, PIMS, Maharashtra, India.

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## I N F O

### Corresponding Author:

Badrinarayan Mishra, Dept. of Community Medicine, Ruxmaniben Deepchand Gardi Medical College, Ujjain, Madhya Pradesh, India.

### E-mail Id:

[badrinmishra@gmail.com](mailto:badrinmishra@gmail.com)

### Orcid Id:

<https://orcid.org/0000-0001-6956-0469>

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## A B S T R A C T

**Background:** Many chronic diseases are considered age-related. The study reports the existing health conditions of the geriatric population from rural Maharashtra.

**Aims and Objectives:** This cross-sectional study assessed the health conditions of the geriatric population in a rural area of Western Maharashtra and associated them with their sociodemographic and nutritional parameters.

**Methodology:** 260 participants were assessed by Gerald Joglest 'Geriatric Health Questionnaire' and pertinent health issues were collected from the primary health centre and individual health records. Nutritional assessment was done by MNA (Mini Nutritional Assessment) questionnaire. SPSS version 20 software was used for data analysis.

**Result:** Out of 260, there were 148 (56.9%) male and 112 (43.1%) female participants and the mean age was 72.11 ( $\pm 6.59$ ). All forms of functional living status were significant associations ( $p < 0.001$ ) with nutritional status. Anaemia was found in 64.16%. Cataract, joint pain, chronic cough, tuberculosis, and varicose veins were prevalent in females, whereas toothache, impaired hearing, hypertension, skin diseases, diabetes, and bladder issues were dominant ones among males. BMI (Body Mass Index) was significantly associated with joint complaints, chronic cough, bowel and bladder problems, and diabetes ( $p < 0.05$ ).

**Conclusion:** The rural geriatric population faces the issue of a double dilemma. On one hand, there exists a significant nutritional vulnerability that impairs daily living, on the other hand, the association of BMI with select disease conditions highlights the emerging issue of obesity.

**Keywords:** Rural Geriatrics, Nutrition, Health Issues, ADL and IADL

## Introduction

Ageing is a universal process. While some consider it as an

incurable disease, others opine that "You do not heal old age, you protect it, you promote it and you extend it."<sup>1</sup> India

has made steady progress in the health care sector. From the time of independence to date we have improved our life expectancy from 32 to 69.73 years.<sup>2</sup> This encouraging achievement has brought along new challenges; the challenge to bring up a fit and healthy senior citizens. For this purpose, it is important that accurate information is available about their health conditions and nutritional status.

### Aim

The concluded study was designed to assess health status among the geriatric population in a rural area of western Maharashtra and associate them with their existing nutritional status.

### Objectives

- To estimate the health condition of the geriatric population in a rural area and find the common comorbidities affecting them
- To estimate any association of morbidity pattern and grade of nutrition among the participants.
- To suggest recommendations to improve the picture

### Methodology

A cross-sectional community-based study involving 260 participants over the age of 65 years was carried out to estimate the point prevalence of different study parameters. The select rural community comes under the field practice area of a rural medical college situated in western Maharashtra with an expected number of elderly at 197 i.e, 8.6% of the village that had a total population of 2472 with 1289 males and 1183 females, as per Census 2011.<sup>3</sup>

The sample size was calculated by the formula  $4pq/l^2$ , where; p, the prevalence of malnutrition in the elderly was taken at 20%, q was 100-p= 80 and l, the maximum allowable error was considered at 5%. This yielded a sample of 256 which was rounded up to the closest figure of 260.

### Inclusion Criteria

Participants were permanent residents of the village, aged  $\geq 65$  years, with the ability to understand and answer the questions and willing to give written consent were enrolled for the study.

### Exclusion Criteria

Participants with known malignancy and other severe illnesses were kept out.

EIC and ICMR Ethical approval were obtained by ICMR Reference Number: 2010-00995.

### Data Collection

260 Individuals were selected by simple random technique

from an available study population of 298 over a period of 3 months. The age of the participants was estimated preferably from the government-issued 'Ration card.' In case of its unavailability, the mean value of responses relating to the recalled age at marriage, age at vital events in the family was considered.<sup>4,5</sup>

The health status was assessed by the Geriatric Health Questionnaire: developed by Gerald Jogrest, the University of Iowa, consisting of 9 different questions regarding general health, Activities of Daily Living, Instrumental Activities of Daily Living, Medications, Sexual activity, Immunization, etc.<sup>6</sup>

Morbidity profile was collected from available patient records relating to tuberculosis, diabetes, hypertension, other cardiac illness and other past illnesses. In the case of nonavailability of records, information was collected by on spot clinical examination by the investigator and assigned interns. Participants were examined for Hypertension by measuring blood pressure at participants home on 3 different times of the day on three different days of the week by WHO recommended standardized standing mercury sphygmomanometer with ISI certification. Eye diseases were screened for the presence of cataract by torchlight examination and presence of lens opacity and different eye shadows were recorded, vision test was carried out by Snellen chart, surgical illnesses, Respiratory diseases, and other Medical illness that includes joint problems, toothache, impaired hearing, skin problems, bowel, and bladder problems were detected by history and relevant clinical examinations like spirometry, webbers tests, woods light, oral mirror and torch, etc. In addition to this information relating to general sociodemography was also gathered. Nutritional status was evaluated by MNA.<sup>7</sup>

### Data Analysis

Data was coded and descriptive, and inferential analysis carried out by SPSS version 20. 'Chi-Square' test of significance' with Yates correction' was used at relevant places. 'Z-test' of variation between two means was applied to compare various anthropometric measurements with various grades of nutrition. 'P' value of significance was set at  $<0.05$ .

### Result

There were 148 (56.9%) males and 112 (43.1%) females with the mean age of participants at 72.11 ( $\pm 6$ )59 years. General sociodemographic characteristics of the studied population described in Table 1.

Functional status assessment (ADL and IADL) were compared with different grades of nutrition. It was observed that there was a significant association between functional status with that of a grade of nutrition ( $p < 0.001$ ). The results are depicted in Table 2.

**Table 1. Sociodemographic characteristics of participants**

Age distribution			
Age (years)	Male	Female	Total
65-70	76 (51.35%)	48 (42.1%)	124 (47.69%)
71-75	39 (26.35%)	34 (30.36%)	73 (28.08%)
76-80	13 (8.78%)	20 (17.86%)	33 (12.69%)
81-90	17 (11.48%)	7 (6.25%)	24 (9.23%)
>90	3 (2.03%)	3 (2.68%)	6 (2.3%)
Total	148(100%)	112 (100%)	260 (100%)
Economic status_			
Per capita income (Rs.)#	Male	Female	Total
<350	2 (13%)	3 (2.6%)	5 (1.9%)
350-700	24 (16.2%)	26 (23.2%)	50 (19.2%)
700-1100	48 (32.4%)	40 (35.7%)	88 (33.8%)
1100-2200	46 (31%)	28 (25%)	74 (28.4%)
>2200	28 (18.9%)	15 (13.3%)	43 (16.5%)
Total	148 (100%)	112 (100%)	260 (100%)
#As per modified B.G.Prasad classification.			
Educational status			
Education	Male	Female	Total
Illiterate	95 (64.1%)	88 (78.5%)	183 (70.3%)
primary	26 (17.5%)	13 (11.6%)	39 (15.2%)
secondary and higher secondary	18 (12.1%)	10 (8.9%)	28 (10.7%)
10 <sup>th</sup> +	9 (6%)	1 (0.8%)	10 (3.8%)
Total	148 (100%)	112 (100%)	260 (100%)
Family support			
Living with	Male	Female	Total
Child and spouse	85 (57.4%)	58 (51.7%)	143 (55%)
Child only	28 (18.9%)	24 (21.4%)	52 (20%)
Spouse only	22 (14.8%)	17 (15.1%)	39 (15%)
Others	13 (8.78%)	13 (11.6%)	26 (10%)
Total	148 (100%)	112 (100%)	260 (100%)

**Table 2. Association between Functional Status of daily leaving and grade of nutrition**

ADL/ IADL	Response	Well-nourished	At the risk of malnutrition	Undernourished	Test of significance
Walking	I	96 (84.96)	88 (79.28)	13 (36.11)	p<0.001
	A	17 (15.04)	19 (17.12)	15 (41.67)	
	D	0 (0)	4 (3.6)	8 (22.22)	
Eating	I	106 (93.8)	94 (84.69)	16 (44.44)	p<0.001
	A	5 (4.43)	13 (11.71)	13 (36.11)	
	D	2 (1.77)	4 (3.6)	7 (19.44)	

Dressing	I	105 (92.92)	89 (80.18)	19 (52.78)	p<0.001
	A	8 (7.08)	15 (13.51)	11 (30.56)	
	D	0 (0)	7 (6.31)	6 (16.67)	
Toileting	I	109 (96.46)	94 (84.69)	17 (47.22)	p<0.001
	A	3 (2.65)	13 (11.71)	14 (38.89)	
	D	1 (0.89)	4 (3.6)	5 (13.89)	
Bathing	I	108 (95.57)	89 (80.18)	21 (58.33)	p<0.001
	A	5 (4.43)	15 (13.51)	9 (25)	
	D	0 (0)	7 (6.31)	6 (16.67)	
House-work	I	97 (85.84)	75 (67.57)	12 (33.33)	p<0.001
	A	15 (13.27)	22 (19.82)	11 (30.56)	
	D	1 (0.89)	14 (12.61)	13 (36.11)	
Shopping	I	97 (85.84)	82 (73.87)	15 (41.67)	p<0.001
	A	14 (12.39)	15 (13.51)	7 (19.44)	
	D	2 (1.77)	14 (12.61)	14 (38.89)	
Taking medications	I	106 (93.8)	83 (74.79)	9 (25)	p<0.001
	A	5 (4.43)	20 (18.01)	17 (47.22)	
	D	2 (1.77)	8 (7.2)	10 (27.78)	
Managing finances	I	102 (90.27)	86 (77.48)	9 (25)	p<0.001
	A	7 (6.19)	15 (13.52)	16 (44.44)	
	D	4 (3.57)	10 (9)	11 (30.55)	

I- Independent; A- Requires assistance; D- Dependency. Values in bracket indicate percentage.

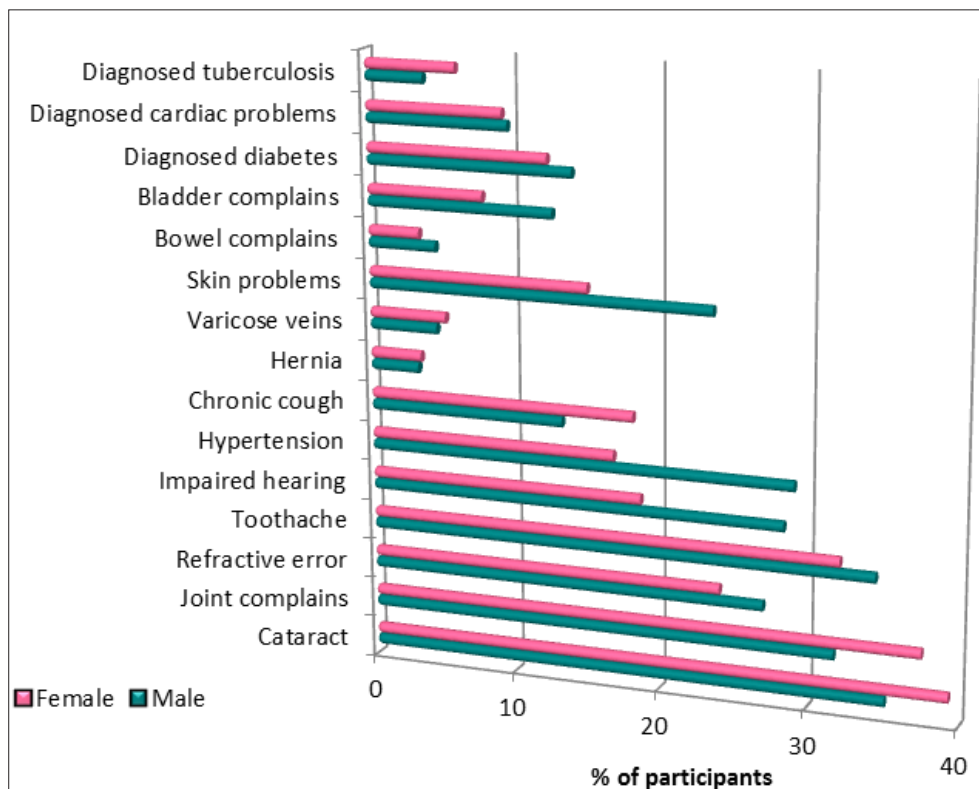


Figure I. Morbidities pattern reported in study participants

**Table 3. Association of morbid conditions with Body Mass Index in participants**

Morbidity	>23 kg/m <sup>2</sup>	≤23 kg/m <sup>2</sup>	Total	Test of significance (p-value)
Cataract	41 (42.71%)	55 (57.29%)	96 (100%)	p>0.05
Joint complains	47 (52.81%)	42 (47.19%)	89 (100%)	p<0.05
Refractive error	35 (52.24%)	32 (47.76%)	67 (100%)	p>0.05
Toothache	42 (48.28%)	45 (51.72%)	87 (100%)	p>0.05
Impaired hearing	26 (41.27%)	37 (58.73%)	63 (100%)	p>0.05
Hypertension	26 (41.94%)	36 (58.06%)	62 (100%)	p>0.05
Chronic cough	9 (21.42%)	33 (78.57%)	42 (100%)	p<0.001
Hernia	4 (44.44%)	5 (55.56%)	9 (100%)	p>0.05
Varicose veins	6 (46.15%)	7 (53.84%)	13 (100%)	p>0.05
Skin problems	22 (42.31%)	30 (57.69%)	52 (100%)	p>0.05
Bowel complains	1 (9.1%)	10 (90.9%)	11 (100%)	p<0.05
Bladder complains	2 (7.14%)	26 (92.86%)	28 (100%)	p<0.001
Diagnosed diabetes	23 (65.71%)	12 (34.28%)	35 (100%)	p<0.001
Diagnosed cardiac morbidity	13 (52%)	12 (48%)	25 (100%)	p>0.05
Diagnosed tuberculosis	4 (30.77%)	9 (69.23%)	13 (100%)	p>0.05

On clinical examination, pallor was found in 64.16% of which 54.8% was in males and 77.67% females. The compilation of data from medical records and clinical examinations brought forth the following morbidities. The mean number of morbidity conditions was 2.49; where it was 2.66 in males and 2.27 in females. Cataract, joint pain, chronic cough, tuberculosis, and various veins were more prevalent in females and toothache, impaired hearing, HTN, skin diseases, diabetes, and bladder issues were dominant ones among males. They are presented in Figure 1.

The South-East Asian BMI cutoff (23 kg/m<sup>2</sup>) was adopted for better accuracy. All morbidities were compared with B.M.I and their associations observed. Joint problems (pain and deformity), chronic cough, 'Bowel and Bladder' complaints, and diabetes were found to have a significant association (p< 0.05) with BMI. The detailed analysis is presented in Table 3.

## Discussion

Illiteracy, poor economic condition and deterioration of family support were evident among the studied subjects. N. Bayapa Reddy et al in their Chennai study opined that a majority of the subjects in old age were widows/widowers, illiterates, living with family, and showing economic dependency.<sup>8</sup> Prabha Adhikari in her special article on unmet need of Indian geriatrics also highlighted the issue of poverty, lack of income security and poor access to health care as a major determinant of disability and mortality in older persons.<sup>9</sup>

In this study, it was seen that 88.46% of geriatrics were affected by at least one medical condition. Srinivas K. et al.,<sup>10</sup> Bhatia et al.,<sup>11</sup> Niranjana et al.<sup>12</sup> found out the similar prevalence of medical problems in the range of 85%, 85%, and 82.9% of elderly Indian people respectively. In terms of mean morbid conditions per participants we found it to be at 2.49. A J Purity et al.<sup>13</sup> also reported similar figures ( mean morbidity at 2.77) in their study.

We observed pallor in 64.16% of participants. Prevalence of anaemia in the close range was reported in studies by Kamlesh Joshi et al (66.5%), and A J Purity et al. (52.5%).<sup>13,14</sup> The following proportion of participants in the concluded study reported with cataract (32.92%), Joint complaints (34.23%), and toothache (33.46%). This observation finds strength from researchers like Kamlesh Joshi et al where proportions of participants with cataract were 38.0%, and osteoarthritis 33.0%, and A J Purity et al who found out joint problems in 43.4%, dental and chewing problems in 42%, reduced visual acuity in 57% of elderly studied by them.<sup>13,14</sup>

All 9 variables under Functional status assessment (ADL and IADL) were compared with participants nutritional grades and all of them were found to be strongly associated with it. Participant's deteriorating nutrition had a deleterious effect on the functional status of the elderly (p<0.001). Studies by Yi Chia Huang et al and Maria R M Oliveira et al observed higher prevalence of malnutrition in the functionally dependent group than the non- functionally dependent group (44.7% v/s 25%) based on Nutrition Risk Index (NRI).<sup>15,16</sup>

## Strengths and limitations

Use of well-validated tools like 'MNA' and 'Geriatric Health Questionnaire' developed by Gerald Jogrest for nutritional and health status assessment were the strong points of the study. Selecting the population  $\geq 65$  years was planned to get a realistic picture of old age population.

Health status assessment on the basis of self-reporting and clinical examination, without investigatory supports were our main limitations.

## Conclusion

Though it is difficult to generalize the findings the application of the current methodology on diverse settings could be useful in reflection the true scenario. Old Age is also known as 'Second Childhood'.<sup>17</sup> With the changing scenario and demographic transition favouring geriatric population, the Government should have focus activities in the line of the RCH program. Though we have drafted 'National Programme for Health Care of the Elderly (NPHCE)' a comprehensive package, under Non-Communicable Division with the Validity of the Scheme till 2016-17, the deliverables were grossly unmet.<sup>18</sup>

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**Conflict of Interest:** None

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