

## Research Article

### Nutritional Status and Dietary Habits of the Elderly Population in a Village in Punjab

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#### **Abstract:**

**Objectives:** To assess the nutritional status and dietary habits of the elderly population and their associations with socio-demographic factors in a rural area.

**Methodology:** The Design is an **analytical cross-sectional study**. The **Population** was elderly men or women with age 60 years or above. This study was conducted in a village named Jia Bagga, district of Lahore, Pakistan. The **sample size** was **100** elderly subjects.

**Results:** The mean age of the subjects was 69.08 and the mean BMI was 25.09. Out of 100 individuals that participated 22% were malnourished and 50% were at risk of malnourishment. Malnourishment was found to be significantly associated with age, financial dependency, physical activity, and overall eating habits. 18% of the subjects had fair, 81% had good and only 1% had excellent eating habits.

The study has proved to us that the nutritional status of the elderly population in Rural areas is not satisfactory as most of the individuals were either at risk of being malnourished or were malnourished. So keeping these findings in mind, future policies regarding the Health and Well being of the elderly population should be carved in such a way that puts in place some barriers that can prevent this from happening. These policies will help us decrease the burden on our healthcare system and decrease morbidity and mortality as well.

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## **INTRODUCTION:**

There is no standard age beyond which a person can be labeled old, however, according to the UN; the age hallmark of 60 years qualifies a person as elderly<sup>1</sup>. The population of older people in the world is rising and currently sits at 617 million (8.5% of the total)<sup>2</sup>. The elderly in Pakistan were 3.5% and 6.25% of the demographic in 1998 and 2012 respectively, with an expected rise up to 9.3% by 2030<sup>3</sup>. Malnutrition refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients<sup>4</sup>. Eating habits can be defined as how a person or a group eats, considering what types of food are eaten, in what quantities, and when they are eaten<sup>5</sup>. Pakistan relies heavily on the co-residence of the elderly with their families but their basic needs are often neglected<sup>6</sup> leading to nutritional and dietary problems.

The elderly often tend to suffer from poor eating habits due to decreased physical exertion. His overall nutritional status can be further impaired by metabolic stresses induced by insufficient protein intake. Protein malnutrition was found to be associated with an increased risk of injury in elderly patients<sup>7</sup> whereas administration of protein in the diet reduced injury and healing times in patients above 65<sup>8</sup>. Inadequate nutritional status was also found to be associated with cognitive impairment<sup>9</sup>. The fatal consequences of most common diseases of old age such as diabetes, hypertension, ischemic heart disease, gout, visual impairment, anemia, and decreased immunity can be prevented by adequate nutrition. A study in Manipur India presented 44.7% of the people with BMI less than 19 and 34.7% with BMI greater than 23<sup>11</sup>. Research

conducted in Islamabad indicated that among the chosen elderly, 8% were malnourished and 43.7% were at risk of malnourishment<sup>12</sup>. Similar research in Sargodha city concluded that 5.53% of the elderly were malnourished and 43.3% stood at risk of malnourishment<sup>13</sup>.

Life expectancies in countries such as the UK (80.96 years) and Japan (83.98 years) contrast greatly with the figures observed in developing nations like Pakistan, where the life expectancy rate hovers as low as 66.48 years<sup>14</sup>. Apart from other differences, a monumental culprit behind this vast difference is the neglect of the elderly. The dependent sector of any demographic is comprised of women, children, and the elderly. But where on one hand, the former two receive adequate tending to; the latter group often gets forsaken. A large chunk of our country's elderly resides within the rural lands, and our literature review returned us with no substantial studies having been previously conducted in these areas. The epicenter of our research is the elderly residing in rural areas of Pakistan will help us assess the gravity of this situation, as the outcomes of this research will add to the already published literature and would be beneficial in devising intervention methods.

## **METHODS AND METHOD:**

It was an analytical cross-sectional study that took place in a rural setting of Jia Bagga village (UC 271), Tehsil Raiwind, District Lahore for 9 months (January 2019 to September 2019). A sample size of 100 persons was taken by using a 95% confidence level and 8% absolute precision with the expected percentage of malnutrition as 20.8%.<sup>11</sup>

$$CI\ 95\% = \text{confidence level } 95\% = 1.96$$

$p = \text{prevalence} = 20.8\%$

$q = 1-p$

$d = \text{absolute precision} = 8\%$

The sampling technique used was simple random sampling. Subjects of age 60 or above were included in the study. Those who did not cooperate were excluded along with those suffering from severe cognitive impairment, and severely debilitated, those who were already on some dietary intervention, and those whose votes were not registered with the Election Commission of Pakistan were also not included in the sampling frame. A sampling frame consisting of all elderly people was devised using voter lists of the village for 2018 elections by the Election Commission of Pakistan (ECP). Randomly selected persons from the sampling frame were approached and after obtaining written consent; they were interviewed and their nutritional status, dietary habits, socio-demographic, and health status were assessed by using Urdu translations of the Mini Nutritional Assessment tool (Made by Nestle Nutrition Institute, based in Vevey, Switzerland), Healthy Eating Assessment tool (Government of North-west Territories, Canada) and a customized socio-demographic questionnaire. They were interviewed and the questionnaires were duly filled by the researchers as most of them were illiterate. Weight and height were calculated by a digital weighing machine and non-stretchable measuring tape. Only those subjects were interviewed who fulfilled the inclusion/exclusion criteria. If a person previously selected was not available or he/she did not consent to be part of the study then using simple random sampling another person was selected from the sampling frame.

Data were analyzed through SPSS version 26. Quantitative variables like age were presented as +/- standard deviation. Qualitative variables like gender were presented as frequency and percentages. The Association of different factors was calculated by chi-square test; taking a p-value less than 0.05 as significant.

### **RESULTS:**

Out of 100 subjects, 54 were males and 46 were females. As the sample size was 100 thus the frequencies and percentages are the same throughout. The mean age was found to be 69 with an SD of +/- 9.08 with 60 subjects falling in the 60-69 age group, 19 in the 70-79 age group, and 21 were 80 or above. About 13 percent of the sample population had BMI less than 19, 29% had a BMI between 19 and 23, and more than half (57%) of the sample population had BMI greater than 23; with the mean BMI calculated to be 25.09 with SD of +/- 6.27. Most of the subjects were illiterate (90%). The majority were poor socioeconomically with a monthly income of less than Rs.30, 000 (79%). Most of them were financially dependent on others (62%) while only 38% were independent. About half of the subjects did not have any diagnosed common chronic diseases (43%). On the other hand in those who were unhealthy; hypertension was found to be the most common disease (35%). The majority of the subjects were not addicted to anything (49%), followed by cigarette smoking (28%). Using MNA, out of these 100 subjects, 22 were malnourished, 50 were at risk of malnourishment, and only 28 had normal nutritional status. Malnourishment had a significant association with age, financial status, physical activity, and overall

eating habits ( $p < 0.05$ ) as shown in Table 2. The various MNA questions were answered as shown in Table 1. Using the Healthy Eating Assessment tool, 18 percent of the subjects were found to have fair eating habits and

81 percent had good while only 1 percent of the subjects had excellent eating habits. None of the subjects had poor eating habits. The various questions of HEA were answered as shown in Table 4.

<b>Table: 1 Mini Nutritional Assessment</b>		
<b>MNA questions</b>		<b>Count/Frequency</b>
Decrease in food intake due to loss of appetite, digestive problems, swallowing and chewing difficulties in the last 3 months	Severe decrease in food intake	17
	Moderate decrease in food intake	27
	No decrease in food intake	56
Weight loss in the last 3 months	Loss of more than 3kg weight	8
	Don't know	17
	Weight loss between 1 and 3 kg	34
	No weight loss	41
The level of mobility the subject has	Bed or chair bound	3
	Able to get out of bed/chair but does not go out	20
	Goes out	77
Psychological stress or acute disease in the past 3 months	Yes	39
	No	61
Presence or absence of dementia, depression	Severe dementia or depression	10
	Mild dementia	31
	No psychological problem	59
Calf circumference in cm*	Less than 31cm	2
	31cm or more	0

\*Calf circumference was measured only when BMI could not be calculated.

**Table: 2 Nutritional status of participants and associated factors**

Factors	Subgroups	Nutritional status				P value
		Well-nourished (n=28) n (%row wise)	At risk of malnutrition (n=50) n (%)	Malnourished (n=22) n(% row-wise)	Total n (%)	
Age groups (years)	60-65	17(60.7)	25(50.0)	8(36.4)	50(100)	0.032
	66-69	6(21.4)	3(6.0)	1(4.5)	10(100)	
	70-75	1(3.6)	9(18.0)	5(22.7)	15(100)	
	76-79	2(7.1)	2(4.0)	0(0.0)	4(100)	
	>80	2(7.1)	11(22.0)	8(36.4)	21(100)	
Gender	Females	8(17.4)	25(54.3)	13(28.3)	46(100)	0.072
	Males	20(37.0)	25(46.3)	9(16.7)	54(100)	
Financial status	Independent	17(4.7)	15(39.5)	6(15.8)	38(100)	0.014
	Dependent	11(17.7)	35(56.5)	16(25.8)	62(100)	
Physical activity	Bedridden	1(6.7)	5(33.3)	9(60.0)	15(100)	0.000
	Walking	11(21.2)	30(57.7)	11(21.2)	52(100)	
	Jogging	2(33.3)	4(66.7)	0(0.0)	6(100)	
	Heavy work	14(51.9)	11(40.7)	2(7.4)	27(100)	
Overall eating habits	Poor	0(0.0)	0(0.0)	2(100)	2(100)	0.004
	Fair	0(0.0)	8(57.1)	6(42.9)	14(100)	
	Good	10(25.0)	20(50.0)	10(25.0)	40(100)	
	Very good	14(36.8)	20(52.6)	4(10.5)	38(100)	
	Excellent	4(66.7)	2(33.3)	0(0.0)	5(100)	

**Table: 3 Healthy Eating Assessment**

Questions	Answers	Count
Overall eating habits according to him	Poor	2
	Fair	14
	Good	40
	Very Good	38
	Excellent	6
Number of times fried food or food high in fat/salt/sugar is eaten daily	6 times or more	0
	4 to 5 times	0
	2 to 3 times	12
	Once a day	22
	Less than once	66

Number of servings (1 serving= half cup) of fresh or dried fruits eaten daily	Less than 1	55
	1 time	32
	2 to 3 times	12
	4 to 5 times	1
	6 times or more	0
Number of servings (1 serving=half cup) of fresh or dried vegetables eaten daily	Less than once	26
	Once a day	33
	2 to 3 times a day	38
	4 to 5 times a day	3
	6 or more times a day	0
Number of times tea, cold drink, juice, or other sugary beverages are taken in a day	6 times or more	1
	4 to 5 times	8
	2 to 3 times	43
	Once a day	33
	Less than one per day	15
Number of times high-fat snacks, chips, or crackers are eaten daily	6 times or more	0
	4 to 5 times a day	0
	2 to 3 times a day	5
	Once a day	23
	Less than once a day	72
Number of times sweets, chocolate, or ice cream is eaten	6 times or more	0
	4 to 5 times a day	1
	2 to 3 times per day	11
	Once a day	31
	Less than once a day	57
Amount of butter/margarine you add to your daily food	Heaping amount	1
	A lot	4
	Some	19
	Very little	26
	None	50
Number of times dairy products such as milk, yogurt, or cheese is eaten	Less than once a day	40
	Once a day	40
	2 to 3 times a day	20
	4 to 5 times	0
	6 or more than 6 times	0
Number of times meat, fish, or beans are eaten daily	Less than once	78
	6 or more times	1
	4 to 5 times a day	0
	Once a day	20
	2 to 3 times a day	1

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## **DISCUSSION:**

Aging is a natural process that cannot be altered but can be monitored for better health outcomes since the elderly are a particularly vulnerable group in our society. Malnutrition is one of the many rising challenges being faced that adversely affect many of these health outcomes in this age group either directly or indirectly. Factors such as socioeconomic status, demographics, environment, and prevalent dietary patterns among population groups affect nutrition. Therefore, the elderly were particularly assessed in this study.

In the present study, 60% of the subjects fell in the age group of 60-69 years. A significant association was found between advanced age and MNA scores ( $p < 0.05$ ) similar to some previous studies conducted in the region<sup>11,12</sup>. These consistent findings can be attributed to age-related declining physiological functions of the body including changes in metabolism, and problems related to digestion, chewing, swallowing, and appetite<sup>16,17</sup>. These physiological issues coupled with psychological and social problems can adversely affect the nutritional status of elders. This implies that focus on nutritional status is required with advancing age for better health outcomes.

Malnutrition was found more among females as per MNA scores, but the association wasn't statistically significant ( $p > 0.05$ ). Similar results were also found in studies conducted by Kensal D et al. among the rural Belagavi population and also in a study of the elderly in old age homes in India (2017)<sup>18</sup>. However, a study in Sargodha City (2013) showed more

malnutrition prevalence in males (23.16%) than in females (18.95)<sup>13</sup>. This may be due to different social practices and gender-based attitudes towards the elderly in the two population setups. However, no major differences in eating habits were observed as far as gender is concerned. So further studies are required to assess factors that result in such differences.

In this study, a big majority (90%) of the study population was uneducated, so no association of literacy rate with nutritional status could be observed. However, many previous types of research had shown a significant association of educational status with MNA scores like the study in Puducherry 2016<sup>19</sup> mainly because better awareness about aging, nutrition, and health is seen among the educated population. There was a significant association between malnutrition ( $p < 0.05$ ) and financial dependency which is consistent with other studies done in the region<sup>11,20</sup>.

Tests conducted to assess nutritional status showed quite unexpected results. About half (57%) of the respondents had a BMI > 23 while 30% had a BMI between 19 and 23. The remaining 13% were underweight with a BMI < 19. This was still higher than a similar study in West Bengal in 2014 in which only 9% of subjects were underweight. Using Mini Nutritional Assessment (MNA) as our tool, the prevalence of malnutrition in the elderly population in rural areas was found to be 22% while 50% were at risk. Quite similar results were seen in particular research done in Karachi<sup>12</sup> in 2014 where malnourished were 20% and 46% of subjects were at



risk of malnourishment. Similarly, research conducted in Manipur<sup>11</sup> in 2017 showed that 20.8% of subjects were malnourished and 49.2% were at risk of malnutrition. The figures were however considerably lower in a study of Sargodha city<sup>13</sup> in 2013 where malnourished was 5.53% and the subjects at risk of malnourishment were 42.1%. The difference could have been because the latter was conducted in an urban population with better health services.

On the assessment of their dietary patterns, about two-thirds (78%) of the sample population responded to having good to very good eating habits which showed very less association with their overall nutritional statuses in contrast to other studies. This could be because of bias in the self-reporting of the answers. The majority of respondents reported less intake of meat, cold drinks, and fried food while frequent use of pulses, beans, vegetables, and tea in a day was reported by the majority of the respondents.

A significant relationship was observed between nutritional status and different socio-demographic factors many of which adversely affect the health of the elderly. Further studies of these variables can give better guidelines for the interventional approach.

There are some limitations of the study. Data was collected from only a single village and its findings cannot be generalized to the entire country as different villages have different availability of food and different eating habits. The sample size should have been large. Those subjects who were not available at the time of the study were excluded and other subjects were selected in their place. No assessment of biochemical parameters of nutritional

status and hemoglobin was done because of constraints of resources. The questionnaires were filled as guided by the recall of the subjects which can be impaired in the older ages.

### **CONCLUSION:**

The findings revealed that the nutritional status of the elderly is not satisfactory, the majority of the elderly were either at risk or were malnourished. Therefore, interventions to improve the nutritional status of low-income old age individuals who mainly depend on others for their nutritional needs in rural segments are needed. The elderly population is especially vulnerable to nutritional deficiencies and improving dietary habits can yield better lifestyles, increased life expectancy, better immune functions, better healing time, and decrease morbidity from common co-morbid conditions like diabetes, hypertension, TB, and cardiovascular diseases. Also improved health status of the elderly can decrease the number of admissions in hospitals thus decreasing resource expenditures and also decreasing the workload on hospitals.

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### **LIMITATIONS:**

The sample size was small compared to other studies and only a specific region was investigated in this



study, a small village. The data derived might differ depending on different regions if a large-scale study was conducted. Also, the parameters of nutrition status were derived from a subjective questionnaire. The nutrition status could've been more accurately contemplated if Objectives measures were used such as Laboratory tests, Complete blood count, electrolyte levels, etc.

## REFERENCES:

1. World Health Organization (2019). A proposed working definition of an older person in Africa for MDS project. [Online]. Available at <https://www.who.int/healthinfo/survey/agingdefnolder/en/> [accessed 16 march 2019]
2. World's older population grows dramatically [internet]. National Institute of Health(NIH).2019 [cited 16 march 2019]. Available from: <https://www.nih.gov/news-events/news-releases-worlds-older-population-grows-dramatically>
3. Ashiq U, Asad, AZ. The rising old age problem in Pakistan. *J Res Soc Pak.* 2016;54(2):325-33. Available from: [http://pu.edu.pk/images/journal-history/PDF-FILES/23-Paper\\_54\\_2\\_17.pdf](http://pu.edu.pk/images/journal-history/PDF-FILES/23-Paper_54_2_17.pdf)
4. Malnutrition [Internet]. Africa : World Health Organization ; 2016 [ cited 26 March 2019] Available from: <https://www.who.int/features/qa-malnutrition/en/#>
5. Eating habits [Internet]. [Place unknown] : Encyclopedia.com ; 2016 [ cited : 26 March 2019] Available from : <https://www.encyclopedia.com/food/news-wires-white-papers-and-books/eating-habits>
6. Cox, D. and E.Jimenez, 1990. Achieving Social Objectives through private transfer, *Oxford Journals: Econ. And soc. Sci.*, 5(2):205-218.
7. Mühlberg W, Weidemann G, Stedtfeld HW, Sieber C. Low total protein increases injury risk in the elderly. *Journal of the American Geriatrics Society.* 2004;52:324-5. Available from: <https://www.ncbi.nlm.nih.gov/m/pubmed/14728654/>
8. Collins JJ, Baase CM, Sharda CE, Ozminkowski RJ, Nicholson S, Billotti GM, et al. The assessment of chronic health conditions on work performance, absence, and total economic impact for employers. *J Occup Environ Med.* 2005;47(6):547-57. Available from: <https://www.ncbi.nlm.nih.gov/m/pubmed/15951714/>
9. Sanders C, Behrens S, Schwartz S, Wengreen H, Corcoran DC, Lyketsos CG, et al. Nutritional status is associated with faster cognitive decline and worse functional impairment in the progression of dementia: The Cache County Dementia Progression Study. *J Alzheimers Dis.* 2016;52(1):33–42. Available from: <https://www.ncbi.nlm.nih.gov/m/pubmed/26967207/>
10. Soini H, Routasalo P, Lagström H. Characteristics of the mini-nutritional assessment in elderly home-care patients. *Eur J Clin Nutr.* 2004;58:64-70. Available from: <https://www.ncbi.nlm.nih.gov/m/pubmed/14679369/>
11. Joymati O, Ningombam M, Rajkumari B, Gangmei A. Assessment of nutritional status among elderly population in a rural area in Manipur: community-based cross-sectional study. *Int J Community Med Public Health* 2018;5:3125-9. Available from :<https://www.researchgate.net/>

- publication/325948202\_Assessment\_of\_nutritional\_status\_among\_elderly\_population\_in\_a\_rural\_area\_in\_Manipur\_community-based\_cross-sectional\_study
12. Ahmad AMR, Ronis KA. Nutritional Status of Pakistan's Elderly Population: A Comparative Review with Low to Middle Income Countries. *Pak J Publ Health*, 2015. Available from: [https://www.researchgate.net/publication/282211617\\_Title\\_Nutritional\\_Status\\_of\\_Pakistan's\\_Elderly\\_Population\\_A\\_Comparative\\_Review\\_with\\_Low\\_to\\_Middle\\_Income\\_Countries](https://www.researchgate.net/publication/282211617_Title_Nutritional_Status_of_Pakistan's_Elderly_Population_A_Comparative_Review_with_Low_to_Middle_Income_Countries)
  13. Ghani A, Hussain S, Zubair M. Assessment of nutritional status of geriatric population in Sargodha City. *Int J Med Appl Health*. 2013;1(1):22-8. Available from: [https://www.researchgate.net/publication/320077591\\_ASSESSMENT\\_OF\\_NUTRITIONAL\\_STATUS\\_OF\\_GERIATRIC\\_POPULATION\\_IN\\_SARGODHA\\_CITY](https://www.researchgate.net/publication/320077591_ASSESSMENT_OF_NUTRITIONAL_STATUS_OF_GERIATRIC_POPULATION_IN_SARGODHA_CITY)
  14. Average life expectancy by country [internet]. World data.info.2019 [cited 16 march 2019] available from: <https://www.worlddata.info/life-expectancy.php>
  15. Adapted from: Paxton, et al. (2011). Starting the conversation: performance of a brief dietary assessment and intervention tool for health professionals. *American journal of preventive medicine*, 40(1), 67-71
  16. Goisser S, Guyonnet S, Volkert D. The role of nutrition in frailty: An overview. *J Frailty Aging*. 2016 Jan 1;5(2):74-7. Available at: <https://link.springer.com/article/10.1186/s12877-017-0496-2>
  17. Bernstein M, Munoz N. Nutrition for the older adult. Jones & Bartlett Learning; 2019 Jan 2.
  18. Santosh A, Srinivas N, Varadaraja Rao BA. Geriatric Nutrition: Elderly at Risk of Malnutrition in Old Age Homes. *Natl J Community Med* 2017; 8(8):447-450
  19. Kalaiselvi S, Arjumand Y, Jayalakshmy R, Gomathi R, Pruthu T, Palanivel C. Prevalence of under-nutrition, associated factors and perceived nutritional status among elderly in a rural area of Puducherry, South India. *Archives of gerontology and geriatrics*. 2016 Jul 1;65:156-60. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5749086/>
  20. De Silva K, Liyanage C, Wijesinghe C, Perera B. Nutritional status of elders in Galle district, Sri Lanka. *Galle Medical Journal*. 2017 Mar 28;22(1). Available from: <https://gmj.sljol.info/articles/abstract/10.4038/gmj.v22i1.7958/>