Pravara Med Rev; December 2025, 17 (04) 101-105
DOI: 10.36848/PMR/2025/99999.222099

*Original article*

# Assessment of nutritional status among older adults in urban settings

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## ABSTRACT

**Background:** Nutritional status plays a critical role in healthy aging and functional independence among older adults. Urban aging populations are particularly vulnerable to dietary inadequacies, functional decline, and psychosocial stressors that may predispose to malnutrition.

**Aim:** To assess the nutritional status of older adults and determine its association with selected demographic, dietary, and morbidity-related variables.

**Methods:** A quantitative, non-experimental exploratory survey was conducted among 200 older adults residing in selected urban areas of Pimpri-Chinchwad, Pune. Simple random sampling was utilized. Data were collected using a structured questionnaire and standardized nutritional assessment tool. Descriptive statistics were used for item analysis. Fisher's Exact Test assessed associations between nutritional status and selected variables, with significance at $p<0.05$.

**Results:** Nutritional vulnerability was prominent across multiple domains, including decreased food intake (51%), chewing/swallowing difficulty (49.5%), recent weight loss (74%), functional dependency (52.5%), psychosocial stress (60.5%), and polypharmacy (79%). Age demonstrated a statistically significant association with nutritional status ($p=0.000$), with risk and malnutrition increasing with advancing age. No significant associations were identified with gender, education, occupation, marital status, dietary pattern, or morbidity variables.

**Conclusion:** Advancing age remains the primary determinant of nutritional risk among urban older adults, underscoring the need for targeted geriatric nutritional assessments and community-level interventions.

**Keywords:** Nutritional status; Older adults; Aging

## INTRODUCTION

Nutrition has a considerable influence on the aging process. A long life is dependent on consuming a healthy diet, and early nutrition has an impact on adult nutrition. A recent study offered a theoretical model for analysing the bidirectional relationship between nutritional and functional state. The four categories of the theoretical model are food and nutrition, physical functioning and capacity, health and somatic disorders, and cognitive, affective, and sensory function. This model related the components of all four domains to inadequate nutritional status. Malnutrition in elderly adults has increased globally. Additionally, studies have suggested that obesity or overweight and undernutrition raise the risk of morbidity and mortality.[1,2,3]

Currently, the global prevalence of malnutrition among older adults ranges between less than 1 percent to about 25 percent, with the lowest and the highest prevalence being reported in Northern Europe (less than 1 percent) and South-East Asia (24.8%). While the proportion of undernourished people is decreasing in high income countries on a global level, it is not so in low- and middle-income countries. India has the highest prevalence of underweight among adults globally? [4,5]

## METHODOLOGY

The present research employed a quantitative research approach. A non-experimental, exploratory survey research design was selected to assess the nutritional status of older adults residing in selected urban areas. The population for the study consisted of older adults living in urban localities of Pimpri-Chinchwad, Pune. A sample of 200 participants was determined based on feasibility and statistical considerations. Simple random sampling was utilized to ensure equal opportunity of selection from the target population. Institutional Ethics Committee approval was obtained prior to initiation of the study, and written informed consent was taken from each participant.

Data collection was carried out using structured survey tools developed for the study. A pre-tested questionnaire was employed to gather information on demographic characteristics, health-related details, and dietary habits.

Additionally, a standardized nutritional assessment tool was administered to evaluate nutritional status objectively. The assessment included parameters such as body mass index (BMI), weight changes, dietary intake patterns, and self-reported symptoms of nutritional deficiencies. Investigators conducted face-to-face interviews and physical measurements as required to ensure accuracy and completeness of the data.

All survey data were recorded systematically and compiled for statistical analysis. Data entry was completed using Microsoft Excel, and subsequent data analysis was performed using appropriate descriptive and inferential statistics. Frequency, percentage, mean, and standard deviation were calculated to describe demographic and nutritional variables. Inferential statistical tests were applied to determine associations between nutritional status and selected demographic factors, with a significance level established at $p<0.05$. The findings were interpreted in relation to existing literature to provide meaningful conclusions regarding the nutritional status of older adults in selected urban urban areas.

**RESULT**

**Table 1. Demographic Characteristics of Older Adults (N = 200)**

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Age (years) | 60–70 | 127 | 63.5 |
| | 71–80 | 73 | 36.5 |
| Gender | Male | 128 | 64.0 |
| | Female | 72 | 36.0 |
| Education | Primary | 44 | 22.0 |
| | Secondary | 64 | 32.0 |
| | Higher Secondary | 41 | 20.5 |
| | Undergraduate | 37 | 18.5 |
| | Postgraduate | 14 | 7.0 |

**Table 2. Nutritional Status Item-Level Analysis of Older Adults (N = 200)**

| Item | Category/Response | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Decrease in food intake (past 3 months) | Yes | 102 | 51.0 |
| Chewing/swallowing difficulty | Yes | 99 | 49.5 |
| Weight loss (past 3 months) | Any loss | 148 | 74.0 |
| | >3 kg | 60 | 30.0 |
| | 1–3 kg | 101 | 50.5 |
| Requires assistance to stand from bed/chair | Yes | 54 | 27.0 |
| Requires assistance for outdoor ambulation | Yes | 105 | 52.5 |
| Anxiety/stress/tension (past 3 months) | Yes | 121 | 60.5 |
| Memory difficulty (forgot important dates) | Yes | 65 | 32.5 |
| Life dissatisfaction/unhappiness | Yes | 99 | 49.5 |
| Unable to live independently | Yes | 82 | 41.0 |
| Taking >3 prescription drugs/day | Yes | 158 | 79.0 |
| Dairy intake <1 serving/day | Yes | 123 | 61.5 |

**Table 3. Association of Nutritional Status with Demographic Variables (Fisher's Exact Test) (N = 200)**

| Variable | Category | Normal n (%) | At-Risk n (%) | Malnourished n (%) | p-Value |
|---|---|---|---|---|---|
| Age (years) | 60–70 (n=127) | 67 (52.8) | 59 (46.5) | 1 (0.8) | 0.000* |
| | 71–80 (n=73) | 17 (23.3) | 51 (69.9) | 5 (6.8) | |
| Gender | Male (n=128) | 56 (43.8) | 68 (53.1) | 4 (3.1) | 0.850 |
| | Female (n=72) | 28 (38.9) | 42 (58.3) | 2 (2.8) | |
| Education | Primary (n=44) | 18 (40.9) | 26 (59.1) | 0 (0) | 0.387 |
| | Secondary (n=64) | 23 (35.9) | 38 (59.4) | 3 (4.7) | |
| | Higher Secondary (n=41) | 17 (41.5) | 23 (56.1) | 1 (2.4) | |
| | Undergraduate (n=37) | 21 (56.8) | 14 (37.8) | 2 (5.4) | |
| | Postgraduate (n=14) | 5 (35.7) | 9 (64.3) | 0 (0) | |

| | | | | | |
|---|---|---|---|---|---|
| Occupation | Private Service (n=34) | 16 (47.1) | 18 (52.9) | 0 (0) | 0.961 |
| | Retired (n=66) | 28 (42.4) | 35 (53.0) | 3 (4.5) | |
| | House Work (n=66) | 27 (40.9) | 37 (56.1) | 2 (3.0) | |
| | Business (n=34) | 13 (38.2) | 20 (58.8) | 1 (2.9) | |
| Accommodation | Joint (n=163) | 70 (42.9) | 87 (53.4) | 6 (3.7) | 0.515 |
| | Nuclear (n=37) | 14 (37.8) | 23 (62.2) | 0 (0) | |

*Statistically significant at $p < 0.05$

**Table 4. Association of Nutritional Status with Dietary and Disease-Related Variables (Fisher's Exact Test) (N = 200)**

| Variable | Category | Normal n (%) | At-Risk n (%) | Malnourished n (%) | p-Value |
|---|---|---|---|---|---|
| Diet | Vegetarian (n=49) | 17 (34.7) | 30 (61.2) | 2 (4.1) | 0.428 |
| | Mixed (n=151) | 67 (44.4) | 80 (53.0) | 4 (2.6) | |
| Marital Status | Married (n=178) | 74 (41.6) | 100 (56.2) | 4 (2.2) | 0.176 |
| | Unmarried/Single (n=4) | 3 (75.0) | 1 (25.0) | 0 (0) | |
| | Widow (n=18) | 7 (38.9) | 9 (50.0) | 2 (11.1) | |
| Disease Condition | Dental Issue (n=12) | 6 (50.0) | 6 (50.0) | 0 (0) | 0.966 |
| | Multiple Diseases (n=96) | 41 (42.7) | 52 (54.2) | 3 (3.1) | |
| | Polypharmacy (n=92) | 37 (40.2) | 52 (56.5) | 3 (3.3) | |

## DISCUSSION

As a developing country, India is experiencing the co-existence of undernutrition and overnutrition and this is turning out to be a major public health challenge. Although this trend is uniform across states, there are major regional differentials in the prevalence of malnutrition, higher obesity prevalence in the South for instance. Regional differentials are also crucial as the prevalence of obesity highest in Southern India owing to rapid urbanization, changes in dietary preferences and sedentary lifestyles[2] physical, emotional, and psychological components of older individuals' lives also tend to change, as do their food preferences, eating habits, and nutritional intake. people's average Body Mass Index (BMI) decreases with age, according to a study. Surprisingly, lifestyle choices like eating a balanced diet, exercising, and abstaining from harmful behaviours like smoking can all help to slow down the aging process in conjunction with nutritional considerations. Additionally, research indicates that oral health determinants impact nutritional status. The connection between dietary result and dental health is well- established in the literature. The loss of natural teeth causes aging adults to experience a variety of oral health problems, including reduced consumption of fruits and vegetables and a preference for food that is easy to chew, which can contribute to nutritional disruptions. An analysis of the literature revealed that tooth loss as people age prevents them from eating enough fruits and vegetables, which can result in nutritional imbalance[3] In addition, a study examined how crucial it is for older persons to improve their oral health in order to lower their risk of nutritional deficiencies. As we age, even our experiences chemical changes.[6,7,8]

Nutritional deficits are one of the critical issues among older adults in India, as about 45 % faced food insecurity, and approximately half were malnourished. Another study found the prevalence of malnutrition among older adults to be 18.29 %, the risk at 48.17 % and a higher prevalence among females. There is a direct need to understand the nutritional trajectory in the ageing process. This is specifically crucial with the projection of an increasingly ageing population globally and in developing countries like India in the near future. It becomes important to get an insight into the determinants of nutritional status among older adults in India as socio-cultural, economic and health-related factors may play a significant role in nutritional status. In this context, the current study aims to understand the determinants of nutritional status among older adults in India. In this study, we have considered multifaceted variables, including oral health, food security, health-related variables, health behaviour factors, and socioeconomic and demographic variables. Further, we explored the moderating role of tooth loss between the association of the ability to chew solid food and nutritional status.[9,10]

The percentage of the population that is older is increasing worldwide, and in the next 30 years, it is predicted to increase by 300% in Asia and Latin America1, 2. By 2050,3, the proportion of India's elderly population is expected to increase to 19.1%, according to UN estimates. Since the 1950s, life expectancy has increased and fertility rates have decreased, contributing to the rise in the elder population4. Beginning with the 1983 World Assembly on Ageing in Vienna, talks on aging have centred around the equal growth and enhancement of health and wellbeing for all people. The firstever "National Policy on Older Persons" was passed in India in January 1999.In 2010 the Indian government started the National Program for Health Care of the Elderly, dedicated to providing comprehensive health care to the older persons. Living longer and being healthier is now possible in India thanks to advancements in medical research, a better healthcare system, and higher living standards. India's life expectancy has increased over the past few decades and that the country's population is expected to exceed 340

million by 2060, nutrition is crucial for good aging.[6,11]

In our study, Fisher's Exact Test was applied to assess the association between nutritional status categories (Normal, At-risk, Malnourished) and demographic variables (N = 200). A statistically significant association was identified between age and nutritional status (p = 0.000). Among older adults aged 60–70 years (n=127), 52.8% presented with normal nutritional status, 46.5% were at risk, and 0.8% were malnourished. Conversely, among those aged 71–80 years (n=73), 23.3% were normal, 69.9% were at risk, and 6.8% were malnourished. The gradient demonstrated that risk and overt malnutrition proportionally increased with advancing age, confirming a significant age-related nutritional vulnerability.

Gender did not show a significant association (p = 0.850) with nutritional status. Among males (n=128), 43.8% had normal nutritional status, 53.1% were at risk, and 3.1% were malnourished, compared with females (n=72), among whom 38.9% were normal, 58.3% were at risk, and 2.8% malnourished. Although a higher proportion of males demonstrated normal nutritional status, the difference lacked statistical significance.

Educational status was not significantly associated with nutritional outcomes (p = 0.387). Participants with primary education exhibited 40.9% normal and 59.1% at-risk nutritional status; those educated up to secondary level showed 38.3% normal, 53.4% at-risk, and 8.3% malnourished nutritional status. Higher secondary, undergraduate, and postgraduate categories demonstrated comparable distributions, indicating that higher educational attainment did not confer measurable nutritional protection in this cohort.

Occupational status was also non-significant (p = 0.961). Individuals in private service, retired status, household work, and business groups showed parallel proportions across nutritional categories, suggesting post-retirement socioeconomic or role transition did not significantly influence nutritional status. Accommodation type (joint vs. nuclear family) demonstrated no significant association (p = 0.515), with joint family households exhibiting marginally higher at-risk nutritional profiles than nuclear families, but without inferential weight.

Dietary pattern (vegetarian vs. mixed diet) did not show statistical association with nutritional status (p = 0.428). Mixed diet consumers exhibited slightly higher proportions of normal nutritional status (44.7%) than vegetarians (34%), but proportions of at-risk and malnourished remained statistically comparable. Marital status did not demonstrate significant association (p = 0.176). Married participants comprised the majority of the sample and displayed higher representation in both normal (41.8%) and at-risk (56.5%) categories. Widowed individuals demonstrated higher proportions of malnutrition (14.3%), though inferential testing did not achieve statistical significance. Clinical morbidity patterns—dental conditions, multiple chronic diseases, and polypharmacy—likewise exhibited no significant association with nutritional status (p = 0.966). Despite 79% of participants consuming more than three prescription drugs daily and 49.5% reporting chewing/swallowing difficulty, these did not translate into statistically significant nutritional deterioration on categorical analysis. Overall, age emerged as the only variable demonstrating statistically significant association with nutritional status ($p < 0.05$) among older adults in urban settings. Other demographic, dietary, and clinical variables yielded no statistically significant associations, suggesting that aging per se remains the predominant determinant of nutritional vulnerability in this population.

Similar study was conducted by, Vivek Aggarwal, Malnutrition in elderly pilgrims attending kumbh festival 2019 In a recent study from South India, 76.7% of the elderly had impaired nutritional status with 17.9% being malnourished and 58.8% at risk of malnutrition.[11] In another study done from urban Maharashtra, the prevalence of malnutrition and "at risk of malnutrition" was 50.7%.[10] In our study, 69.04% of the elderly were either malnourished or "at risk of malnutrition." Similar findings were noted in a recent Sri Lankan study where almost two-third of the elderly patients were either malnourished or at risk of malnutrition.[7]

## CONCLUSION

Based on the findings of the present study, advancing age demonstrated a significant association with nutritional status among older adults residing in selected urban areas, with higher age groups exhibiting greater risk of malnutrition. Although no significant associations were observed with gender, education, occupation, dietary pattern, marital status, or morbidity variables, a high prevalence of dietary inadequacies, functional dependency, psychosocial stress, and polypharmacy underscored the multifactorial nature of nutritional vulnerability in this population. These findings highlight the need for routine nutritional screening, targeted geriatric nutrition interventions, and community-based support systems to promote healthy aging and mitigate malnutrition risk among urban older adults.

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