

# A Comparative Study on the Prevalence of Malnutrition and Dietary Assessment among Elderly Women in Residential Care Facilities and Independent Homes

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**Abstract:** *Elderly women's overall health, quality of life, and death rates are all impacted by malnutrition, which is a serious public health concern. The purpose of this study is to assess the prevalence of malnutrition among older women living in independent homes and residential care facilities. The quantitative research design is used in this study. Stratified sampling was used to choose the samples. Eighty participants in all were chosen for the study. Of these, forty were chosen from residential care facilities (Group II) and forty from independent households (Group I). The risk of malnutrition was assessed using malnutrition screening tools including the Mini Nutritional Assessment and Malnutrition Universal Screening. The 3-Day Dietary Recall was used to measure the macronutrient intake of both groups. The study's findings demonstrated that malnutrition was more prevalent among women residing in residential care facilities than among those living on their own. Dietary patterns in residential care facilities were less favourable compared to those in independent homes. Both Group I and Group II had low energy consumption when comparing macronutrient intake. Group II consumed less protein and carbohydrates, whereas Group I consumed more protein. Both groups consumed an excessive amount of fat. This emphasizes how critical it is to treat older women's nutritional status. Those who were found to be malnourished were consequently given nutrition education, highlighting the urgent need for targeted interventions to enhance their nutritional well-being.*

**Keywords:** Malnutrition, elderly women, residential care facilities, independent homes, dietary pattern

## 1. Introduction

The unavoidable process of aging starts at birth and continues throughout life. It can be controlled to support health and wellbeing in later years even though it cannot be stopped. People in their later years are referred to as older adults (Bukunmi & Jeremiah, 2018).

Due to longer life expectancies, the number of older adults worldwide is expected to increase from 1.049 billion in 2020 to 1.859 billion by 2050 (UN DESA/PD, 2019). Long life does not, however, equate to healthier years. Effective monitoring and management are crucial since malnutrition, chronic disease, and functional impairment are frequently associated with aging (Russell, 2001).

A key factor in good aging is nutritional status. Age-related declines in nutritional quality and intake increase the risk of malnutrition, illness, and a lower quality of life (Papadopoulou et al., 2023). The issue is especially serious in long-term care institutions, where older persons are extremely vulnerable due to physiological changes, decreased hunger, and delayed detection (Maria C. V. et al., 2020).

Undernutrition and overnutrition are major problems in India, with regional variations. Obesity is increasing in Southern India as a result of sedentary lifestyles, nutritional changes, and urbanization. Women report worse health and are more likely than men to experience disability, depression, cognitive

decline, and nutritional inadequacies despite having longer life expectancies (Akancha & Aparajita, 2022).

Currently, 7.7% of Indians are over 60, a percentage that is continuously rising. However, regulations continue to prioritize maternal, child, and communicable diseases over the health of the elderly. Because the Body Mass Index (BMI) does not account for changes in body composition with age, malnutrition in older persons is also underreported. Although its application in community settings is still restricted, the Mini Nutritional Assessment (MNA) offers a more sensitive and accurate instrument (Mathew, Das et al., 2016).

This current study uses MUST and MNA to compare elderly women in residential care facilities with those who live independently. It also evaluates dietary intake patterns to highlight the nutritional needs of this susceptible group.

## 2. Methodology

Data on a number of variables, such as demographics, anthropometric measurements (height, weight, body mass index, calf circumference, and mid-arm circumference), medical history, and eating habits, were gathered using a standardized questionnaire. A three-day dietary recall was used to document the subjects' food intake. Their nutritional status was evaluated using MUST (Malnutrition Universal Screening Tool) and MNA (Mini Nutrition Assessment).

The study was carried out in individual homes from Porur, Avadi, and Thiruninravur, Chennai neighborhoods as well as in a residential care facility. The study design used was quantitative research design. Eighty senior individuals over 60 were chosen using stratified sampling after the necessary sample size was determined. There were forty individuals from the residential care facility (Group II) and forty from independent residences (Group I).

Descriptive statistical techniques were used to analyze the gathered data. To summarize the results, the mean, standard deviation, and frequency distributions were computed. The distribution of variables across groups was shown using cross-tabulation. The prevalence of malnutrition was compared between elderly women living in independent homes and those in residential care facilities using the chi-square test.

### 3. Results and Discussion

#### Body Mass Index

**Table 1:** Distribution of BMI

BMI	Group I (n)	Group II (n)	Total
Underweight	2	10	12
Normal	12	13	25
Overweight	17	11	28
Obese I	8	5	13
Obese II	1	1	2

Table 1 above demonstrates that of the 80 subjects, 2 were underweight, 12 were normal, 17 were overweight, eight were obese I, and 1 was in the obese II group in Group I, while 10 were underweight, 13 were normal, 11 were overweight, 5 were in the obese I category, and 1 was in the obese II category in Group II.

#### Description of Mid Arm Circumference (MAC) & Calf Circumference

**Table 2:** Distribution of mid upper arm circumference

Groups	Mid-arm circumference (cm)	Frequency (n)	Percentage
Group-I	less than 21	4	10.0
	21 to 22	6	15.0
	greater than 22	30	75.0
Group-II	less than 21	8	20.0
	21 to 22	10	25.0
	greater than 22	22	55.0

The mid-arm circumference (MAC) distribution of the study groups is shown in Table 2. 10.0% of participants in Group I had MAC less than 21 cm, 15.0% had MAC between 21 and 22 cm, and 75.0% had MAC greater than 22 cm. MAC was less than 21 cm for 20.0% of Group II, between 21 and 22 cm for 25.0%, and greater than 22 cm for 55.0%. According to a study by Bhagwasia M. et al., the ideal MAC cut-offs for females over 60 are 22.5 cm as the lower limit and >25 cm as the maximum limit.

**Table 3:** Distribution of Calf Circumference (CC)

Groups	Calf circumference (cm)	Frequency (n)	Percentage (%)
Group-I	less than 31	5	12.5
	31 or greater	35	87.5
Group-II	less than 31	11	27.5
	31 or greater	29	72.5

The distribution of calf circumference among the study groups is shown in Table 3. In Group I, 87.5% of patients had CC  $\geq$ 31 cm, whereas 12.5% had CC <31 cm. In Group II, 72.5% had CC  $\geq$ 31 cm and 27.5% had CC <31 cm.

#### Description of Mean Nutrient Intake (3 Day Dietary Recall) of the Selected Subjects

**Table 4:** Distribution of mean macronutrient intake

Nutrients	Group-I Mean	Group-II Mean	RDA
Energy (Kcals)	1476	1182	1500
Protein (g)	48.4	39.9	40
Fat(g)	44	34.4	44
Carbohydrate(g)	214	162	214

Table 4 compares the subjects' macronutrient consumption to the recommended daily allowance for older women, which is 1500 kcal, 40 g protein, 33.3–50 g fat, and 187–225 g carbs. Group II consumed 1182 kcal, 39.9 g protein, 34.4 g fat, and 162 g carbohydrates, whereas Group I reported mean intakes of 1476 kcal, 48.4 g protein, 44 g fat, and 214 g carbohydrates. While Group II consumed less energy, fat, and carbohydrates, Group I met the RDA needs.

#### Description of Prevalence of Malnutrition among Groups Using MNA

**Table 5:** Prevalence of Malnutrition Using MNA

Malnutrition indicator score	Groups		p value
	Group-I n (%)	Group-II n (%)	
Less than 17 points - Malnourished	0(0)	2(5)	0.025*
17 to 23.5 points - At risk of malnutrition	9(22.5)	18(45)	
24 to 30 points - Normal nutritional status	31(77.5)	20(50)	

\* Statistical significance with 95% CI

Table 5 illustrates that 77.5% of Group I had a normal nutritional status, 22.5% were at risk, and there were no incidents of malnutrition. In Group II, 5% were malnourished, 45% were at risk, and 50% had normal status. Group II had a higher risk of malnutrition, and the difference between the groups was statistically significant ( $p < 0.05$ ).

#### Description of Prevalence of Malnutrition among the Groups Using MUST

**Table 6:** Prevalence of Malnutrition Using MUST

Malnutrition risk according to MUST	Groups		p value
	Group-I n (%)	Group-II n (%)	
Low risk	36 (90)	26 (65)	0.022*
Medium risk	2 (5)	4 (10)	
High risk	2 (5)	10 (25)	

\* Statistical significance with 95% CI

As Table 6 illustrates, Ninety percent of the subjects in Group I were at low risk, 5% were at medium risk, and 5% were at high risk of malnutrition, according to MUST, 10 percent were at high danger, 4 percent were at medium risk, and 65 percent were at low risk in Group II. Group II had a higher

risk of malnutrition, and the difference between the groups was significant ( $p < 0.05$ ).

**Association of Malnutrition Score with their Dietary Intake among the Elderly Subjects**

**Table 7:** Association of Malnutrition score and frequency of energy intake

Groups	Malnutrition indicator score	Energy	
		Normal Intake (n)	Low Intake (n)
Group-I	17 to 23.5 points - At risk of malnutrition	1	8
	24 to 30 points - Normal nutritional status	19	12
Group-II	Less than 17 points - Malnourished	0	2
	17 to 23.5 points - At risk of malnutrition	0	18
	24 to 30 points - Normal nutritional status	0	20

The association between the frequency of energy intake and the malnutrition score was shown in Table 7 above. The recommended daily allowance of energy for older women was 1500 calories. Eight of the people in Group I who were at risk of malnutrition had low energy intake, and only one person had normal energy intake when compared to RDA.

Twelve people had low energy intake and 19 had normal energy intake among those with a normal nutritional status. Group II consumed less energy than RDA, despite the fact that 20 of them had normal nutritional status and 18 were at risk of malnutrition.

**Table 8:** Association of Malnutrition score and frequency of Protein intake

Groups	Malnutrition indicator score	Protein	
		Normal intake (n)	Low Intake (n)
Group-I	17 to 23.5 points - At risk of malnutrition	1	8
	24 to 30 points - Normal nutritional status	21	10
Group-II	Less than 17 points - Malnourished	0	2
	17 to 23.5 points - At risk of malnutrition	0	18
	24 to 30 points - Normal nutritional status	0	20

The association between the frequency of protein consumption and the malnutrition score was displayed in Table 8 above. Elderly women had an RDA of 40 grams of protein. Eight of the people in Group I who were at risk of malnutrition had low protein intake, and only one person had a normal protein intake when compared to RDA. Among

those with a normal nutritional status, 21 of them had a normal protein intake and 10 had low protein intake. Group II consumed less protein than the recommended daily allowance, despite the fact that 20 of them had normal nutritional status and 18 were at risk of malnutrition.

**Table 9:** Association of Malnutrition score and frequency of Fat intake

Groups	Malnutrition indicator score	Fat		
		Low Intake (n)	Normal Intake (n)	High Intake (n)
Group-I	17 to 23.5 points - At risk of malnutrition	4	5	0
	24 to 30 points - Normal nutritional status	0	25	6
Group-II	Less than 17 points - Malnourished	0	2	0
	17 to 23.5 points - At risk of malnutrition	10	8	0
	24 to 30 points - Normal nutritional status	9	11	0

The association between the frequency of fat consumption and the malnutrition score was displayed in Table 9 above. For elderly women, the recommended daily allowance of fat was 33–50 grams. Of the people in Group I who were at risk of malnutrition, 4 had low fat intake and 5 had normal fat intake as compared to RDA. Of individuals with a normal

nutritional status, 6 had high fat intake and 25 had normal fat intake.

Group II consumed less fat than RDA, despite the fact that 20 of them had normal nutritional status and 18 were at risk of malnutrition.

**Table 10:** Association of Malnutrition score and frequency of carbohydrate intake

Groups	Malnutrition indicator score	Carbohydrate		
		Low Intake (n)	Normal Intake (n)	High Intake (n)
Group-I	17 to 23.5 points - At risk of malnutrition	8	0	1
	24 to 30 points - Normal nutritional status	5	9	17
Group-II	Less than 17 points - Malnourished	2	0	0
	17 to 23.5 points - At risk of malnutrition	18	0	0
	24 to 30 points - Normal nutritional status	20	0	0

Table 9 above illustrated the association between the frequency of carbohydrate intake and the malnutrition score.

The recommended daily allowance for carbohydrates was 187-225 grams. When compared to RDA, eight of the people

in Group I who were at risk of malnutrition had low carbohydrate intake, while just one person had high carbohydrate intake. Nine individuals with a normal nutritional status consumed normal amounts of carbohydrates, while 17 had excessive intakes and 5 had low intakes.

Group II consumed less carbohydrates than the RDA, even though 20 of them had normal nutritional status and 18 were at risk of malnutrition.

#### 4. Conclusion

The dietary differences between older women living in independent homes and those in residential care facilities are highlighted in this study. Elderly women in residential care facilities were more likely to be undernourished, according to anthropometric and nutritional data. The MNA and MUST instruments showed a significantly greater prevalence of malnutrition and risk of malnutrition ( $p < 0.05$ ). When compared to Group I (independent houses), Group II (residential care) showed significantly lower energy, protein, fat, and carbohydrate intake as well as lower mean height, weight, mid-arm, and calf circumferences. Inadequate nutrient intake may also result from the dietary pattern in residential care homes, which is restricted to vegetarian food with less variety. The significant correlation between food consumption and the risk of malnutrition highlights the significance of appropriate and balanced nutrition in this population.

The findings indicate that elderly women in residential care facilities are at a higher risk of malnutrition compared to their counterparts in independent homes. According to similar findings, older women who live in communities are less likely to suffer from malnutrition than those who live in assisted living facilities (Dijson D, et al., 2023). This highlights the necessity of routine nutritional evaluation, customized meal planning, and increased dietary diversity in residential settings to improve senior citizens' health and quality of life.

The study's focus on vegetarian residential facilities, small sample size, and inclusion of exclusively older women were its main limitations. Larger samples, both genders, a variety of dietary situations, and nutrition awareness, monitoring, and customized meal planning should all be included in future research.

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