



# SARCOPENIA AND IT'S ASSOCIATION WITH DIFFERENT DEMOGRAPHIC VARIABLES

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## Abstract

Sarcopenia is a clinical condition in which skeletal muscle mass and strength gradually losses, leading to adverse outcomes including poor quality of life, disability, and death with advancing age. Sarcopenia has been found to be primarily due to aging or secondary due to reduced activity like bed rest, chronic disease, malignancy, poor nutrition or endocrinal disease. A cross-sectional study was chosen to assess the prevalence of sarcopenia among elderly people (above 60 years of age). The sample size for the study is 50. The data was collected by using questionnaires on the demographic variables, standard SARC-F Questionnaires. The association between the different demographic variables and the prevalence of Sarcopenia among old aged people in selected subjects were analyzed using Chi square (x2) tests. All statistical tests were considered as significant whose P-value is less than 0.05. Out of 50 samples 29(58%) members are sarcopenic, 4(8%) members are at risk for sarcopenia and 17(34%) members are non-sarcopenic. This study concludes that sarcopenia is prevalent in geriatric population, especially among women. The prevalence of sarcopenia is 58% of the total studied population and 24% in male and 34% in female. This study also shows that there is a significant association between the prevalence of sarcopenia and the qualification and non-significant association with age, gender, occupation, family type, marital status and food pattern.

## Keywords

Sarcopenia, SARC-F questionnaire, Demographic variables, Chi Square test

## Introduction

Ageing of population is a major health concern now a days. Quality of life is declining with increase in the life expectancy.<sup>1</sup>With aging, the skeletal muscles mass and strength are lost involuntarily. Several studies have shown that, from the 4th decade of life skeletal muscle mass and skeletal muscle strength started decreasing, it decreases up to 50%, and this continues until the 8th decade of life.<sup>2</sup>

Sarcopenia is a clinical condition in which skeletal muscle mass and muscle strength gradually losses, leading to adverse outcomes including poor quality of life, disability, and death with advancing age.<sup>3</sup> It is coined only a few decades ago in the field of nutrition and body composition, it was firstly used to describe the low muscle mass, until it became evident that muscle function was better predictor of outcomes. Around 2010, many definitions were proposed which involves muscle strength and physical performance to this concept.<sup>4</sup>

Rosenberg coined the term sarcopenia in 1989 as a progressive loss in the skeletal muscle mass with advancing age.<sup>5</sup>

Sarcopenia has been found to be primarily due to aging or secondary due to reduced activity like bed rest, chronic disease, malignancy, poor nutrition or endocrinal disease. For the management of secondary sarcopenia, identifying and treating the underlying cause is essential.<sup>6</sup> Sarcopenia is also associated with disease states which maybe acute or chronic, increased insulin resistance, fatigue, falls, and mortality. Sarcopenia of the chronic disease states has been especially associated with rheumatologic conditions, mainly rheumatoid arthritis (RA) in women.<sup>7</sup> The complications of sarcopenia are often severe, they can lead to several negative health conditions, including loss of function, disability and fragility.<sup>2</sup>

The cause of sarcopenia is generally multifactorial which includes environmental causes, disease triggers, inflammatory pathway activation, mitochondrial abnormalities, neuromuscular junctions' loss, reduced in the number of satellite cell, and hormonal changes.<sup>7</sup>

Currently, muscle strength and muscle mass has been recognized as the primary indicator of sarcopenia. In this context, resistance training and proper nutrient intake have shown to improve the conditions of sarcopenia with positive impact on decreasing the incidence of falls and fractures.<sup>8</sup>

The prevalence of sarcopenia differs from one study to another widely due to variations in diagnostic protocols, tools used for assessments, cutoffs used for the assessments, study population, and ethnicity.<sup>6</sup>

Despite the fact that many studies have checked the prevalence and risk factors of sarcopenia for older adults, there were no any study is conducted in Lucknow city of India to assess the prevalence of sarcopenia. Therefore, the purpose of the present study were to (i) estimate the prevalence of sarcopenia and (ii) to seen the association of sarcopenia with the different demographic variables.

## Materials and Methods

A cross-sectional study was chosen to assess the prevalence of sarcopenia among elderly people (above 60 years of age). The study was conducted in Luckow city of Uttar Predesh, India. The target subject of the study comprises of old aged people of both the genders residing in Lucknow city The sample size for the study is 50. The sampling technique used is quota sampling and convenience sampling technique. The inclusion criteria for selecting samples for study are elderly people from 60 and above years of age irrespective of gender, education and socioeconomic status, income, with decreased activity of daily living and inadequate nutritional intake. The data collection is done through conducting a cross sectional survey. The data was collected by using questionnaires on the demographic variables, standard SARC-F Questionnaires to assess the prevalence of Sarcopenia among the subjects. The study period was about four months from January 2023 to April 2023. The collected data were analyzed by using IBM SPSS Statistics 20. The association between the different demographic variables and the prevalence of Sarcopenia among old aged people in selected subjects were analyzed using Chi square ( $\chi^2$ ) tests. All statistical tests were considered as significant whose P-value is less than 0.05.

## SARC-F Questionnaire

The SARC-F questionnaire is a self-reporting five-part survey to examine patients for sarcopenia. It is initially developed in 2012 by Malmstrom et al. as a rapid diagnostic test for sarcopenia. Although developed as a diagnostic tool, SARC-F questionnaire is currently the most validated, adapted, easy to use and less time-consuming screening

tool for sarcopenia. Its components comprise self-reporting of: strength, assistance with walking, rise from a chair, climb stairs and falls on a scale of 0 to 2 from “not at all” to “very difficult”, and the total score out of 10 is calculated. High scores are associated with decline in daily living activities, decreased muscle strength and physical performance.

## Score interpretation

The total score of SARC-F questionnaire ranges from 0 to 10 for each participant. The following score reflects:

- <4 – Non Sarcopenic
- 4 – Risk for Sarcopenia
- >4 – Sarcopenic

## Data collection procedure

A formal permission was obtained from the director of the old age homes in Lucknow city, and data collection was done using questionnaires on the different demographic standards of elderly people consisting of age, gender, educational status, type of family, marital status, food pattern, occupational status, income and SARC-F questionnaires consisting of strength, assistance in walking, rise from a chair, climb stairs and falls to assess the prevalence of sarcopenic state.

## Results and Discussion

The demographic variables of 50 old aged people show, 12(24%) belongs to 60-65 age group, 9(18%) belongs to 66-70 age group, 4(8%) belongs to 71-75 age group, 25(50%) belongs to 76 and above age group of which 27(54%) people were men; 23(46%) people were women. Of these 7(14%) people were illiterate and 43(86%) people were educated; nuclear family were 32(64%), joint family were 18(36%); 20(40%) were married, 25(50%) were widower and 5(10%) were unmarried. Of which 25(50%) are vegetarian, 20(40%) are nonvegetarian, 4(8%) is ovo-vegetarian and 1(2%) is lactovegetarian; 10(31.25%) were not employed, 22(68.75%) were retired.

Out of 50 samples 29(58%) members are sarcopenic, 4(8%) members are at risk for sarcopenia and 17(34%) members are non-sarcopenic. Fig 1 shows that 24 % of men are sarcopenic, 34% of women are sarcopenic; 6% of men are risk for sarcopenic, 2% of women are risk at sarcopenic; 24% of men are non-sarcopenic, 10% of women are non-sarcopenia.

The table-3 shows the association between the different demographic variables and the prevalence of sarcopenia among elderly people. There is non-significant association between sarcopenia and demographic variables such as age, gender, occupation, family type, marital status and food pattern. Whereas there is a significant association between the prevalence of sarcopenia and the qualification.

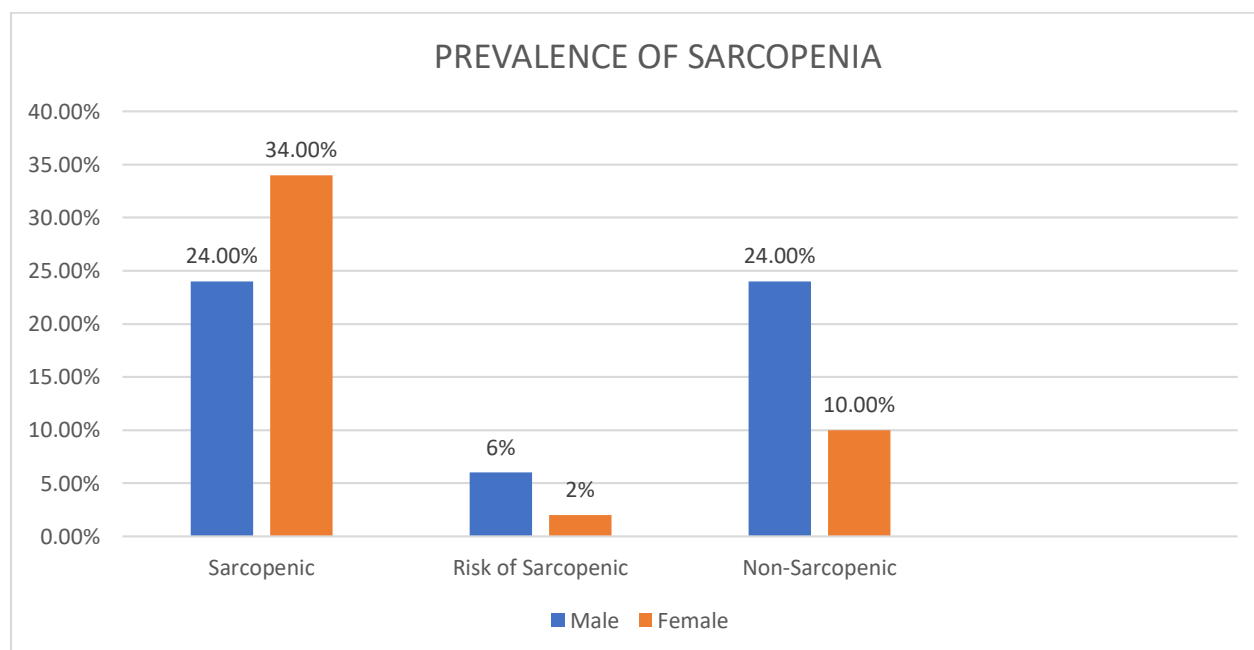
**Table 1: Demographic variables of elderly people (n=50)**

Demographic variables	Frequency	Percentage
<b>Age</b>		
A) 60-65	12	24%
B) 66-70	9	18%
C) 71-75	4	8%
D) 76 and above	25	50%
<b>Sex</b>		
A) Male	27	54%
B) Female	23	46%
<b>Educational status</b>		
A) Secondary	10	20%

B) Senior secondary	13	26%
C) Graduate	15	30%
D) Post graduate	5	10%
E) Illiterate	7	14%
<b>Occupation</b>		
A) Non employed	10	31.25%
B) Retired	22	68.75%
<b>Type of Family</b>		
A) Nuclear family	32	64%
B) Joint family	18	36%
<b>Marital status</b>		
A) Married	20	40%
B) Unmarried	5	10%
C) Widow/Widower	25	50%
<b>Food Pattern</b>		
A) Vegetarian	25	50%
B) Non vegetarian	20	40%
C) Ovo vegetarian	4	8%
D) Lactovegetarian	1	2%

**Table 2: Distribution of prevalence of sarcopenia among old aged people (n=50)**

	Prevalence	Sample Number	Percentage
1.	Sarcopenic	29	58%
2.	Risk for Sarcopenic	4	8%
3	Non-sarcopenic	17	34%



**Fig 1: Prevalence of Sarcopenic State**

**Table 3: Association between the demographic variables and the prevalence of sarcopenia**

<b>Demographic variables</b>	<b>Frequency</b>	<b>Sarcopenic</b>	<b>Risk</b>	<b>Non-sarcopenic</b>	<b>Chi Square</b>
<b>Age</b>					
A) 60-65	12	6	0	6	$X^2 = 5.518$
B) 66-70	9	4	0	5	$F = 6$
C) 71-75	4	2	0	2	$p = 0.479$
D) 76 and above	25	17	2	6	Non-Significant
<b>Gender</b>					$X^2 = 4.453$
A) Male	27	12	3	12	$F = 2$
B) Female	23	17	1	5	$p = 0.108$
					Non-Significant
<b>Qualification</b>					
A) Secondary	10	5	1	4	$X^2 = 14.031$
B) Senior secondary	13	9	3	1	$F = 8$
C) Graduate	15	7	0	8	$p = 0.044$
D) Post graduate	5	2	0	3	Significant
E) Illiterate	7	6	0	1	
<b>Occupation</b>					$X^2 = 1.745$
A) Non employed	10	6	1	3	$F = 2$
B) Retired	22	9	1	12	$p = 0.418$
					Non-Significant
<b>Type of Family</b>					$X^2 = 0.707$
A) Nuclear family	32	18	2	12	$F = 2$
B) Joint family	18	11	2	5	$p = 0.702$
					Non-Significant
<b>Marital status</b>					
A) Married	20	12	1	7	$X^2 = 3.803$
B) Unmarried	5	1	1	7	$F = 4$
C) Widow/Widower	25	16	2	7	$P = 0.433$
					Non-Significant

Food Pattern					
A) Vegetarian	25	16	1	18	$X^2 = 4.043$
B) Non vegetarian	20	19	3	8	F = 6
C) Ovo vegetarian	4	3	0	1	P = 0.671
D) Lactovegetarian	1	1	0	0	Non-Significant

## Conclusion

This study concludes that sarcopenia is prevalent in geriatric population, especially among women. The prevalence of sarcopenia is 58% of the total studied population and 24% in male and 34% in female. Whereas 6% male and 2 % female are at risk of sarcopenia, whom can be prevented from sarcopenia with proper exercise and nutritional intake. This study shows that there is a significant association between the prevalence of sarcopenia and the qualification and non-significant association with age, gender, occupation, family type, marital status and food pattern.

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