



Nutritional Assessment of Geriatric Population (65 - 75 Years)

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Abstract

Geriatric is a term used for elderly people or older adults. Aging is characterized by diminished organ system reserves, weakened homeostatic controls, increased heterogeneity among individuals influenced by genetic and environmental factors. Nutritional needs of the elderly are determined by multiple factors including specific health problems and related organ system compromise on individual's level of activity, energy expenditure, caloric requirements, the ability to access, prepare, ingest, digest food and personal food preferences. Factors that can affect individual aging rates include diverse occurrences as genetic profile, food supply, social circumstances, political events, exposure to disease, climate, natural disasters and other environmental events.

In India the demographic transition is attributed to the increasing fertility and decreasing mortality rates due to availability of better health care services. The objective of this study was to assess the nutritional status of urban geriatric population between the age group of 65-75 years. A purposive sampling technique was used to select the sample size of 60 elderly people to conduct the study. Anthropometric measurements, physical activity pattern, sleeping pattern and eating pattern were assessed by a structured questionnaire which included questions on background data, 24 hour diet recall and food frequency.

Analyses were performed by SPSS software and the data findings were considered to be significant. Of the total number of 60 participants 25% were men and 75% were female. The height and weight results indicated highly significant lower differences when compared with reference standards. Most of the subjects had BMI in the normal range of 18-23 kg/m². Along with height and weight, the hand grip strength was also measured. It was observed that most of the participants had poor hand grip strength. The consumption of macro and micronutrients was low when compared to the RDA's. The mean calorie, protein and fat intake was 1100 kcal, 31.7g and 34.08g for women and 1219 kcal, 37.7g and 35.08g for men respectively.

It was also observed that most of the subjects did not indulge in any kind of physical activity. Most of the participants slept for 8 hours on a daily basis. It was observed that all the subjects consumed cereals and dals on a regular basis but the consumption of fruits and leafy vegetables was comparatively low.

Hence it can be concluded that efforts need to be taken towards counselling for the elderly to encourage them to have optimum nutrition and maintain a healthy lifestyle.

Keywords: Geriatric Population; Nutritional Status; Anthropometry; Physical Activity; Food Frequency; Hand Grip Strength

Abbreviations

ICMR: Indian Council of Medical Research; BMI: Body Mass Index; HGS: Hand Grip Strength; WHR: Wait to Hip Ratio

Introduction

Geriatric is a term used for elderly people or older adults. Aging is characterized by diminished organ system reserves, weakened homeostatic controls, increased heterogeneity among individuals influenced by genetic and environmental factors. The impact of these factors and other life events is impossible to quantify and hard to interpret, especially because it is quite challenging and very expensive to conduct prospective studies on aging for entire life span. Nutritional needs of the elderly are determined by multiple factors including specific health problems and related organ system compromise on individual's level of activity, energy expenditure, caloric requirements, the ability to access, prepare, ingest, digest food and personal food preferences. Factors that can affect individual aging rates include diverse occurrences as genetic profile, food supply, social circumstances, political events, exposure to disease, climate, natural disasters and other environmental events.

According to recent statistics related to elderly people in India, there has been an increase in number of elderly people and it has been projected that in year 2050 the number of elderly people would rise about 324 million. India thus acquired the label of "An Aging Nation" with 7.7% of its population more than 60 years old. In India elderly people suffer from both communicable as well as non-communicable diseases. A decline in immunity as well as age related physiologic changes leads to an increased burden of communicable diseases.

ICMR reported on the chronic morbidity profile in the elderly, states that hearing impairment is most common morbidity followed by vision impairment. The health care services should be based on the "felt needs" of the elderly population. Felt needs may vary depending upon gender, socio-economic status, as well as differences would exist in the rural and urban areas. An ideal preventive health package should include various components such as knowledge and awareness about disease conditions and steps for their prevention and management, good nutrition, a balanced and healthy lifestyle. Global Journal of Medicine and public health stated the contextual factors affecting elderly care in India. Almost all the geriatric health care centers are based in tertiary hospitals in urban areas.

Hence more research needs to be done to find out the felt needs of the geriatric population both in urban as well as rural areas. Since not many studies are available, the present study has been designed to assess the nutritional status and other related parameters with the following objectives:

- To assess the nutrient intake of elderly.
- To assess the nutritional status using Anthropometric measurements along with Hand grip strength.
- To assess the physical activity pattern, sleep cycle and psychological health.

Materials and Methods

The target group was geriatric population between the age group of 65-75 years. Sample size: 60 subjects were selected. Subjects staying in suburban areas of Mumbai were selected. A questionnaire will be designed to collect the data for the samples wherein the following information will be collected. Assessment of nutritional status through a questionnaire.

Anthropometric data is the key to assess the malnutrition status. Height, weight will be measured and based on that BMI will be calculated and compared with Asian standards. Also Hand grip strength will be measured and compared with the standards. 24hr diet recall: A 24 hour diet recall method is quantitative method for nutritional assessment where the subjects will be asked to recall the food and beverages consumed in the past 24 hours. Medical history will give an idea about the medical conditions they suffered in the past. The data collected will be statistically analyzed and relevant statistical tests will be applied. The elderly may suffer from nutrient deficiencies and other comorbidities which will have an effect on nutrient intake.

Results and Discussion

The present study was done on 60 elderly participants living in urban area. This study was undertaken – to assess the nutritional status of elderly people between the ages of 65-75 years. General information was assessed using age and gender. The data collected showed the following results. Age: In the present study the participants ranged from ages 65-75 years with the mean age of 69.23 years. Gender: The study group consisted of 25% males and 75% females. Anthropometric measurements are useful criteria for assessing nutritional status and hence for the present study as per

the target population BMI was calculated to define the level of normalcy, underweight or overweight. In the present study the mean height was 159.20 with standard deviation 8.57 and the mean weight was recorded as 63.38 with standard deviation 10.753. The maximum weight recorded was 78kg and the minimum recorded was 45kg.

Hand grip strength and waist to hip ratio was also considered while taking anthropometry. Majority of the subjects had waist to hip ratio of 0.8. The normal waist to hip ratio for women is 0.7 and for men is 0.9. All the male subjects had a waist to hip ratio of 0.9.

Minimum hand grip strength recorded was 4 kg and maximum was 15 kg with a mean of 6.83 kgs for right hand. Hand grip strength for left hand was recorded as 2 kg minimum and 8kg maximum with a mean of 4.83 kgs. Hand grip strength has gained attention as a simple and non-invasive marker of muscle strength of upper extremities well suitable for clinical use. Poor hand grip strength is a predictor of disability in older people. This tool is useful to identify elderly people at risk of disability.

Medical history of participants was found out for any disorder occurrence. Many of the participants had a past medical history of Hypertension, Diabetes mellitus Type 2 and Asthma.

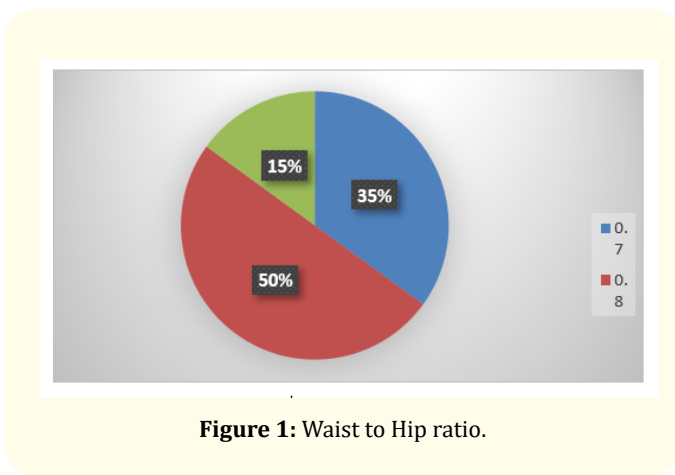


Figure 1: Waist to Hip ratio.

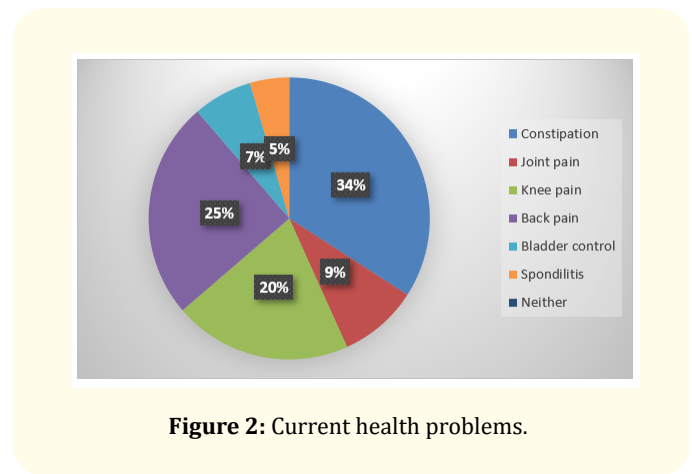


Figure 2: Current health problems.

The table below describes the hand grip strength of the participants. It was observed that most of the participants have poor hand grip strength {Mean= 6.83 for men and 4.83 kg for women} (p < 0.01).

Category	Reference Standards (top end sports)	Minimum Maximum Values	Mean	Standard Deviation (SD)	p value
Men	21.3-44.0	Min- 4 kg Max-15 kg	6.83	2.14	0.000**
Women	14.7-24.5	Min- 2 kg Max- 8 kg	4.83	1.37	0.000**

Table 1: Hand grip strength.

Figure 2 describes the problems which are currently faced by the participants. Participants also had family history of Diabetes mellitus type 2, CVD, Hypertension and some Allergies. The subjects were currently on medication for the above mentioned diseases. As the subjects were ranging in the age group of 65 - 75 years of age, 40% of the subjects also had denture. There were different questions formatted to understand the participant’s diet habits and lifestyle pattern. These questions were related to regular eating habits.

In this table various food groups are included to evaluate participants eating habit and how frequently they consume those food items.

Majority of the subjects consumed rice and wheat on a daily basis. Other cereals like ragi, bajra were consumed very rarely. Oats

Category	Options	Percentage	Chi square	p value
Number of meals consumed per day	3	96	84.6	0.000*
	4	4		
	5	0		
Glasses of water consumed everyday	5	18	12.2	0.001
	6	31		
	7	36		
	8	15		

Table 2: Eating pattern.

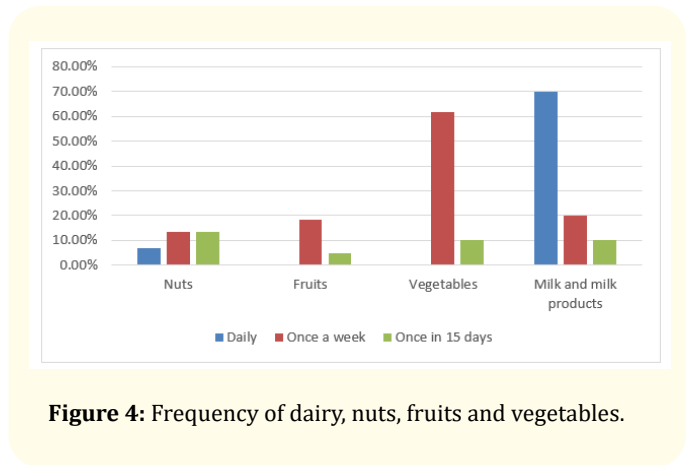


Figure 4: Frequency of dairy, nuts, fruits and vegetables.

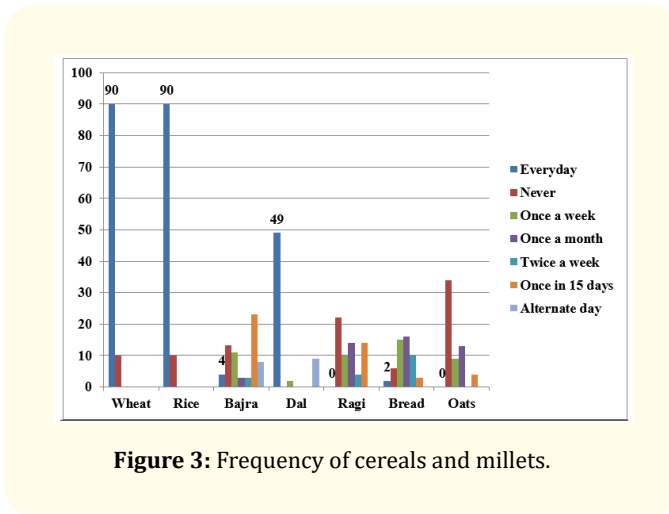


Figure 3: Frequency of cereals and millets.

Nutrient	RDA (ICMR, 2017)	MEAN	p VALUE
Energy (kcal)	2320	1219.78 ± 1050.21	0.000**
Protein (gms)	60	37.7 ± 25.53	0.000**
Fat (gms)	25	35.08 ± 27.5	0.000**
Calcium (mg)	600	465.84 ± 285	0.000**
Iron (mg)	17	9.69 ± 4.60	0.000**

Table 3: Nutrient intake by study group (men).

were not consumed by 49% of the people and the rest only consumed once in a month or once in 15 days. Dal was also consumed daily or on an alternate day basis.

Milk and milk products were also consumed mostly on a daily basis. 70% subjects consumed milk on a daily basis while 23% consumed curd and 18% had buttermilk on a regular basis. 56% of subjects consumed paneer frequently. Some of the subjects were sensitive to dairy products, nuts or soya hence avoided eat in them.

A 24 hour dietary recall of the elderly was assessed.

Table 3 describes the nutrient intake of macro and micronutrients of men. It is observed that the Macronutrient and Micronu-

trient intake by the study group (men) indicated highly significant lower differences when compared with reference RDA. The mean Energy intake was 1219kcal and the participants were deficient in calorie intake. ($p < 0.01$) When compared with the energy intake of RDA value. The mean Protein intake was 37.7g and the participants were deficient by -23.648g ($p < 0.01$) when compared with the protein intake of RDA value. The mean Fat intake was around 35.08g when compared with the fat intake of RDA value. The mean Calcium intake was 465.84mg and the participants were deficient by -140.509mg ($p < 0.01$) when compared with the calcium intake of RDA value. The mean Iron intake was 9.69mg ($p < 0.01$) when compared with the iron intake of RDA value. Thus for both macro and micro nutrient intake was significantly below reference standards.

Table 4 describes the nutrient intake of macro and micronutrients of women. It is observed that the Macronutrient and Micro-nutrient intake by the study group (women) indicated highly significant lower differences when compared with reference RDA. The

Nutrient	RDA (ICMR, 2017)	MEAN	p VALUE
Energy (kcal)	1900	1100.75 ± 950.21	0.000**
Protein (gms)	55	31.7 ± 25.53	0.000**
Fat (gms)	20	34.08 ± 27.5	0.000**
Calcium (mg)	600	375.84 ± 285	0.000**
Iron (mg)	21	10.69 ± 4.60	0.000**

Table 4: Nutrient intake by study group (women).

mean Energy intake was 1100kcal and the participants were deficient in calorie intake. ($p < 0.01$), when compared with the energy intake of RDA value. The mean Protein intake was 31.7g and the participants were deficient by -29.648g ($p < 0.01$) when compared with the protein intake of RDA value. The mean Fat intake was around 34.08g when compared with the fat intake of RDA value. The mean Calcium intake was 375.84mg and the participants were deficient by 220mg ($p < 0.01$) when compared with the calcium intake of RDA value. The mean Iron intake was 10.69mg ($p < 0.01$) when compared with the iron intake of RDA value. Thus for both macro and micro nutrient intake was significantly below reference standards. Elderly consumed less calories, protein, iron and calcium when compared to the RDA. As elderly suffered from chewing problems, hearing disability or visual impairments, it affected their food intake as well.

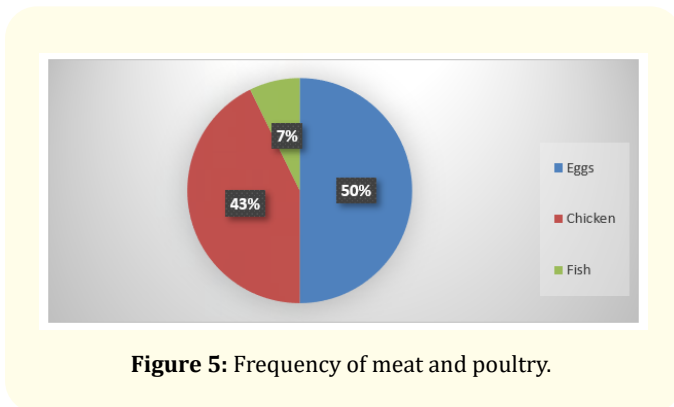


Figure 5: Frequency of meat and poultry.

80% of the participants were vegetarian and only 20% consumed eggs, chicken and fish. Above figure suggests percentage of people consuming meat and poultry once in a week.

Many of the subjects did not indulge in any kind of physical activity. 18% of the subjects indulged in walking while 12% indulged in yoga for 30-40 minutes. One of the most efficient methods of counter-act age related changes in muscle mass and function is physical exercise. Exercise is an efficient and cost effective way of preventing the decline of older people’s functional capacity. Sleeping pattern was also considered while doing the research. It was observed that 52% of the population slept for 7 hours while 20% slept for 8 hours and 28% slept for 6 hours at night [1-18].

Conclusion

It can be concluded from the above study that the energy, macronutrient and micronutrient consumption was low among the geriatric people. It was observed that cereals, dals were consumed by the participants mostly on daily basis. The foods such as vegetables, fruits, dairy products, processed foods, junk food, and bakery items were consumed moderately by the participants. Hence the elderly should be encouraged to eat healthy foods such as fruits, vegetables, and milk and dairy products on daily basis which will provide them with proteins, iron, and calcium and will ensure optimum nutrition. The elderly should be encouraged to have sufficient nutrient intake to avoid any nutrient deficiencies and maintain a healthy lifestyle. Majority of the subjects had BMI’s in the range of 18-23 kg/m². The mean height recorded was 159.2 cm and the mean weight recorded was 63.3 kg. The hand grip strength was found to be on the lower side between the ranges of 2 - 15 kg. The elderly people tend to lose muscle mass due to tissue breakdown. As the elderly consumed less protein, the hand grip strength was seen to be low due to poor muscle mass. It was observed that most of the participants have poor hand grip strength {Mean= 6.83 for men & 4.83 kg for women} ($p < 0.01$).

It was observed that the participants consumed sufficient amount of water per day, hence it was seen that the participants would be prevented from dehydration. Most of the participants said that they consumed 6 - 7 glasses of water daily {(36%) ($X^2 = 12.240, p = 0.001$)} The consumption of macro and micronutrients was low when compared to the reference values of RDA. The mean calorie, protein, fat, iron and calcium intake was 1100 kcal, 31.7g, 34.08g, 10.69 mg and 375.84 mg for women respectively ($p < 0.01$). And the mean intake of calorie, protein, fat, iron and calcium for men was 1219kcal, 37.7g, 35.08g, 9.69mg and 465.84mg for men respectively ($p < 0.01$).

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Bibliography

1. Age care statistics.
2. Irudaya Rajan S. Demography of ageing. In: Dey AB, editor. Ageing in India, Situational analysis and planning for the future. New Delhi: Rakmo Press (2003).
3. Sudha S and Irudaya Rajan S. "Female demographic disadvantage in India 1981-1991: Role of sex selective abortions and female infanticide". *Development Change* 30 (1999): 585-618.
4. Irudaya Rajan S. "Ageing and social security". In: Prakash BA, editor. Kerala's economic development: issues and problems. New Delhi: Sage publications (1999).
5. Arora VK and Bedi RS. "Geriatric Tuberculosis in Himachal Pradesh: A Clinical Radiological Profile". *Journal of the Association of Physicians of India* 37 (1989): 205-207.
6. NNMB National Nutrition Monitoring Bureau. 1979-2002. NNMB Reports: National Institute Of Nutrition, Hyderabad.
7. World Cancer Research Fund. "Food, Nutrition and the Prevention of Cancer: A Global Perspective". Washington, DC: World Cancer Research Fund, American Institute for Cancer Research (1997).
8. [http://www.clinicalnutritionjournal.com/article/s0261-5614\(14\)00111-3/abstract](http://www.clinicalnutritionjournal.com/article/s0261-5614(14)00111-3/abstract)
9. A study of morbidity pattern among geriatric population in an urban area of udaipur rajasthan. rahul prakash, s.k. Choudhary, uday shankar singh deptt. Of community medicine, r.n.t. Medical college, Udaipur.
10. Padda AS., *et al.* "Prevalence of Dementia in an Urban Indian Population". Health Profile of aged persons in urban and rural field practice areas of Medical College Amritsar. *Indian Journal of Community Medicine* 23 (1998): 72-76.
11. Singh C., *et al.* "Social Problems of Aged in a rural population". *Indian Journal of Community Medicine* 19 (1994): 23-25.
12. Martica H Hall, PhD Stephen F. Smagula, MS Robert M. Boudreau, PhD Hilda N. Ayonayon, PhD Suzanne E. Goldman, PhD Tamara B. Harris, MD Barbara L. Naydeck, MPH Susan M. Rubin, MPH Laura Samuelsson, BA Suzanne Satterfield, MD, DrPH.
13. Bret H Goodpaster., *et al.* "The Loss of Skeletal Muscle Strength, Mass, and Quality in Older Adults: The Health, Aging and Body Composition Study". *The Journals of Gerontology: Series A* 61.10 (2006): 1059-1064.
14. Denise K Houston., *et al.* "Dietary protein intake is associated with lean mass change in older, community-dwelling adults: the Health, Aging, and Body Composition (Health ABC) Study". *The American Journal of Clinical Nutrition* 87.1 (2008): 150-155.
15. Andrea Brose., *et al.* "Creatine Supplementation Enhances Isometric Strength and Body Composition Improvements Following Strength Exercise Training in Older Adults". *The Journals of Gerontology: Series A* 58.1 (2003): B11-B19.
16. *Medicine and Science in Sports and Exercise*® Volume 30, Position Stand Exercise and Physical Activity for Older Adults.
17. Sparling Phillip B., *et al.* *BMJ: British Medical Journal (Online)*. London 350 (2015).
18. Dorothy D Dunlop., *et al.*

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