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## Socio economic and dietary pattern assessment of Geriatric subjects residing in Oldage homes of Bangalore district

**Bhavana A, Jamuna KV and Lakshminarayan MT**

### Abstract

The study aimed at assessing the nutritional status of geriatric subjects living in Oldage institutions in the age group of 60-100 years (37 males and 63 females) who were selected from the three different old age institutions located in Bangalore. The results revealed that the majority of the geriatric subjects both females (79.36%) and males (54.05%) had no source of income. Educational status of geriatric subjects indicated majority of males were illiterate (37.83%) and 30.15 percent females of had middle and secondary school education and 10.81 percent of males had studied up to college followed by 23.80 percent of females had primary school education. Majority of the female and male geriatric subjects had no occupation (59.45% and 85.71% respectively) and both the genders males and females had part time employment in the old age institutions where they lived (24.32% and 12.69% respectively). Distribution of nutrients intake by percent RDA in the geriatric subjects indicates that majority of the geriatric subjects had 60-80 percent of nutrient intake compared to RDA and least was observed in intake of fat which is less than 40 percent. This was due to the menu followed by the old age homes where it had foods prepared with very less oil and mild and more of steamed, boiled and baked foods with minimum fat uptake is provided to avoid constipation and gastric discomfort in the geriatric subjects. Correlation coefficient analysed in male geriatric subjects between the age, monthly income, Educational status and among the nutrients had no significant difference. Therefore, the socio economic factors and nutrient intake correlation among the female geriatric subjects residing in old age institution found to have highly significant negative correlation because the female geriatric subjects of the study were aged more. Compared males and had monthly income high to pay for the assistance in the old age institutions. Though they paid high, it had no good impact on the food intake since due to progressive age complications the females geriatric subjects tend to consume very less quantity of food leading to poor nutrients intake.

**Keywords:** Geriatric subjects, old age institutions, socioeconomic status, dietary intake and nutritional status

### Introduction

Old age is also called as senescence in individuals. It is the very last stage in the life courses, of a human being and it is an age group or age band comprising a sector of the oldest members of a population. For statistical and public administrative point of view old age is more often defined as 60 or 65 years of age or older (Webster, 1980).

Ageing population is an unavoidable and irrevocable demographic actuality that is associated with improvements in health and medical concern. With prolonged existence and dwindling fertility rates, the population of older persons (60 years and above) is globally growing more rapidly than the ageing common population.

Globally, the 60 years and above population comprises about (11.5%) of the total population of 7 billion. By 2050, this fraction is projected to increase to about (22%). The part of the elderly in India has been growing at an increasing rate in current years and the trend is probably to continue in the coming decades. The share of population over the age of 60 years is projected to increase from 8 percent in 2015 to (19%) in 2050. By the end of the century, the elderly will compose virtually (34%) of the whole population in the country. The elderly residents of India stands uppermost in Himachal Pradesh (50%), it is followed by Uttar Pradesh and Chhattisgarh and Karnataka (33.7%). Whereas Goa comprises of least geriatric population estimated as 8.2 percent when measured up to all other states in our country. (India Aging Report, 2017)

The dwelling places or living conditions of geriatric population are of different kinds like they live in independent living homes along with their family, assisted living houses with assistant or a care person followed by senior citizen communities where they live along with the same group of aged. One among them is old age homes which are rising in digit day by day in our country; this is due to changing social scenario, incompatibility in living with the families or even by the destitution of geriatric subjects.

The Building of Knowledge Based on Population Aging in India (BKPAI., 2014) survey data signifies that (26%) of older men and approximately (60%) of elderly women do not encompass any personal income. In relation to it one third of the older men and women obtain income from employers or through pension. The chief source of income particularly for older men is still wages. This indicates that elder men work to sustain themselves even during old age.

Susceptibility among older persons intensifies with the flagging functional abilities. Activities of Daily Living (ADL) which are the fundamental tasks of everyday life such as dressing, mobility, bathing, feeding and toilet use. When elder persons are not able to execute these activities, they require support. ADL limitations are symptomatic due to the care burden in any society.

Normally, our natural drive to eat and drink ensures a sufficient intake of food and beverages, allowing an adequate supply of energy and nutrients and resulting in a good nutritional status. With increasing age, this natural drive declines, resulting in anorexia of aging. A decline in the sensations of smell and taste, decreasing central orexigenic signals and increasing gastrointestinal satiety signals all contribute to a generally diminished desire to eat in older individuals. These physiological age-related changes are regarded, on the one hand, as a reasonable adaptation to the natural decrease in energy requirements. On the other hand, they increase the risk of an excessive reduction of food intake and predispose older people to malnutrition. If additional factors like health or social problems accrue, dietary intake is often no longer sufficient to meet nutritional requirements.

The multi-factorial origin of malnutrition is well documented and established. Compared to younger adults, where malnutrition is almost always disease-related, in the elderly, causes are more diverse. Besides the above-mentioned age-related physiological decrease in appetite, many common characteristics of old people including chewing and swallowing problems, physical and cognitive impairment, depression, loneliness and poverty which adversely affect their nutritional intake and have repeatedly been shown to be related to malnutrition (Volkert, 2013) <sup>[11]</sup>.

In addition to it, elderly health status is of dominant importance in the aetiology of malnutrition. Acute and chronic diseases and concomitant multi-medication may not only reduce appetite and food intake, but also increase energy and nutrient requirements, and impair the absorption and alter the metabolism, transport and utilization of nutrients.

Health is resolute by various factors like financial, social, psychosomatic and physiological to be in good condition. Poor health and morbidity reduce the excellence of life and interests of the elderly while mounting psychological suffering and discernment of vulnerability. With advancing natural life, the incidence of acute and chronic morbidities enhances. The pervasiveness of acute morbidity increased from (30%) in the age group 60 to 69 years to (37%) for the

80 and above age group, which is slightly more among women than men.

All these factors in a long run leads to chronic diseases which are the chief causes of death among elderly in India, progressively more over the past 25 years. The section of elderly with any chronic conditions is estimated by BKPAI was (64.8%) in 2011. Chronic ailments are further prevalent among elderly women (674 per 1,000) than elderly men (619 per 1,000). Common chronic ailments such as arthritis, cataract, hypertension and diabetes are more common among women while ailments like asthma and heart disease are more ubiquitous in men.

Nutrition is a core aspect which contributes to the health and functional ability of the elderly. But malnutrition is most common in geriatric subjects due to weak immune system which increases the risk of infections, poor wound healing, muscle weakness, decreased bone mass and lack of appetite. Hence, more focus is needed to assess the dietary eminence and to develop a nutritional care plan.

## Materials and Methods

**Locale of the study:** The three different old age institutions were selected for the study based on the affirmative response from the authorities namely Gandhi Old age Home, Kadabagere, Sri Sai Old age Home and Parvathi Old age Home situated in the Bangalore city. First two institutes are Non-Government Organizations and the last one is a charitable trust. These old age institutions consisted of geriatric subjects from different socio-economic strata.

## Selection of the samples

One hundred geriatric subjects were selected from above mentioned old age institutions using simple random sampling technique, of which 63 were females and 37 were males. The respondents were selected based on their interest of participation in the study period. The one who were severely suffering from illness and bedridden were excluded from the study.

## Development of questionnaire

Based on the objectives of the study, a thorough questionnaire was developed. The developed questionnaire was pretested for its dependability and legitimacy. A pilot study was conducted to establish the viability of the study, after making required adaptations in the pretested questionnaire; the ultimate questionnaire was developed to gather information from geriatric subjects. A complete data schedule was formulated after the pilot study to draw out the information on various aspects related to the assessment pattern of socio-economic status and nutritional status of geriatric subjects. The tools were developed using following information of the study.

1. General information
2. Socio-economic status of the geriatric subjects
3. Dietary pattern and food habits of the geriatric subjects
4. Dietary pattern by 24-hr recall method

**General Information of the respondents:** The initial part of the questionnaire was on general information such age, gender, marital status, religion, family type, period of living in old age institution and reason for living in old age institution were collected using pretested structured questionnaire in the following way.

**Age**

Age was operationalized as the chronological age of the geriatric subjects in completed years at the time of investigation. The respondents were categorised into four age groups: 60-69 years, 70-79 years, 80-89 years and 90 years and above. The information was collected from the primary source the respondents itself.

**Marital status**

Marital status information of the geriatric subjects was investigated by categorising into five groups: Married, separated, divorced, widow/widower and single. The information was composed from the geriatric subjects.

**Religion**

Religion of the geriatric subjects was categorised into two groups as Hindu and others, which included Muslim, Christian, Jains and so on.

**Family Type:** Family type was taken as group of closely related persons living together in a single household with a common kitchen. The categories were nuclear family, joint family and extended family.

**Period of living in Oldage institution**

The geriatric subject's period of living in old age institution was categorized in to four groups based on number of years of living as 1-3 years, 4-6 years, 7-9 years and 10 years and above.

**Socio-Economic profile of the respondents**

Socioeconomic profile of the respondents included

$$\text{Individual intake in terms of raw amount preparation (g/ml)} = \frac{\text{Total raw amount of each ingredient used in the preparation (g/ml)}}{\text{Total cooked amount of each food ingredient}} \times \text{Individual intake of cooked amount (g/ml)}$$

Using the quantity of foods consumed in a day, the foods and beverages were premeditated in terms of calories, proteins, fats, carbohydrates and minerals (Gopalan *et al.*, 2007) [5]. These data were compared beside their RDA. The sufficiency of consumption of nutrients was intended using the formula.

$$\text{Percentage adequacy} = \frac{\text{Intake of each nutrient}}{\text{Recommended allowances}} \times 100$$

**Statistical Analysis**

Suitable the data was tabulated and analyzed by keeping in view of the objectives and parameters of the study. All the analyses were performed in triplicate and the data was analyzed using Excel.

**Results and Discussion****General information of the selected geriatric subjects**

Information on general attributes of the geriatric subjects such as age, marital status, family type, number of children, religion, community, education and occupational status was collected using questionnaire and the data has been depicted in Table 1. Out of 100 selected geriatric subjects in the age group of 60 to 90 years and above, 63 were females and 37 were males.

Age wise distribution of the subjects revealed that majority of males belonged to the age group of 60-69 years (54.05%)

information about the participant's educational status, occupational status, source of income and monthly income (Anon., 2009) [2].

**Educational Status**

The literacy or illiteracy status of the geriatric subjects living in old age institutions was collected from them by categorising into seven groups; illiterate, primary school (1st-4th), middle school (5th-7th), secondary school (8th-10th), PUC, under graduation and post-graduation.

**Monthly income**

Geriatric subjects of lesser age range from 60-75 years worked part time in the old age institution, few of them got income through their pension, some relied on monthly government old age pension and rest of their income was from their children or relatives during monthly visit.

**Twenty-four-hour Dietary Recall Method**

Dietary intake in terms of food and nutrients was assessed for 100 subjects. This includes the type of food eaten in breakfast, lunch and dinner, number of meals consumption. The weekly menu chart followed by three old age institutions. Twenty-four-hour Dietary Recall Method was utilized to assess their dietary pattern. By the use of standard measuring vessel set of 1, standard measuring spoon of 4, cardboard discs of rotis and chapathis and rubber balls for ragi dumplings. The consumption of meal pattern was recorded. The nutrient content of the foods consumed by each subject was recorded and was converted into raw quantity and calculated using the formula. (Thimamayamma, 1987) [10]

followed by females (38.09%) respectively and the least number of male geriatric subjects making up to 2.70 percent was observed under the age group of 90 years and above, the number of female geriatric subjects under the age range of 80-89 years and 90 and above were 19.04 percent and 17.46 percent respectively. Together were almost similar to the age range 60-69 years i.e., (34.09%). There was no significant difference observed between males and females with respect to age group. Pandve *et al.*, (2015) [9] studied age wise distribution of 250 elderly populations in old age home, Bangladesh indicating majority of them were in the age range of 60-75 years. As per the marital status of the geriatric subjects it was found that majority of the males and females were widower and widow (72.97% and 66.66% respectively) and 3.17 percent of females were separated followed by 5.40 percent of males were with their spouse and had no significant difference observed in the marital status. The joint family system in majority was followed by females (68.25%) than in males (40.54%). Family type of the male geriatric subjects was nuclear type that is (59.45%) followed by (31.74%) female geriatric subjects resided before coming old age home. There was a significant difference observed in the family type of selected geriatric subjects lived before joining old age institutions. Anitha *et al.*, (2014) [11] compared the socio demographic profile of elderly living in old age institutions depicting majority were widower and widow.

**Table 1:** General information of the geriatric subjects living in old age institutions

Characteristics	Respondents						χ <sup>2</sup> value
	Male (n=37)		Female (n=63)		Combined (n=100)		
	N	%	N	%	N	%	
<b>Age(years)</b>							
60-69	20	54.05	24	38.09	44	44	0.067
70-79	06	16.21	16	25.39	22	22	
80-89	10	27.02	12	19.04	22	22	
90 and above	01	2.70	11	17.46	12	12	
<b>Marital Status</b>							
With spouse	02	5.40	05	7.93	07	07	0.491
Separated	03	8.10	02	3.17	05	05	
Widower/widow	27	72.97	42	66.66	69	69	
Unmarried	05	13.51	14	22.22	19	19	
<b>Family type</b>							
Joint	15	40.54	43	68.25	58	58	0.006*
Nuclear	22	59.45	20	31.74	42	42	
<b>Number of children</b>							
0-2	19	51.35	23	36.50	42	42	0.330
3-4	10	27.02	20	31.74	30	30	
5-6	-	-	03	4.76	03	03	
No children	08	21.62	17	26.98	25	25	
<b>Religion</b>							
Hindu	33	89.18	56	88.88	89	89	0.963**
Others	04	10.8	07	11.11	11	11	
<b>Education</b>							
Illiterate	14	37.83	13	20.63	27	27	0.149
Primary	07	18.91	15	23.80	22	22	
Middle and secondary	12	32.43	19	30.15	31	31	
College	04	10.81	16	25.39	20	20	
<b>Occupational Status</b>							
No occupation	22	59.45	54	85.71	76	76	0.003*
Retired	06	16.21	01	1.58	07	07	
Employment	09	24.32	08	12.69	17	17	

\*Significant at 0.05%, \*\* Significant at 5%

The selected geriatric subjects both males and females had majority of 1-2 children (51.35% and 36.50% respectively) and (21.62%) males had no children followed by 4.76 percent of females had 3-4 children. But there was no significant difference found among the subjects. Majority of males and females followed Hindu religion (89.18% and 88.88% respectively) and geriatric subjects both males (10.8%) and females (11.11%) belonged to other religions. There was a significant difference observed ( $p < 0.01$  OR 0.05) both religion and community of the geriatric subjects. In educational status of geriatric subjects highest illiterates were males (37.83%) followed by females (30.15%) who had middle and secondary school education primary school education (23.80%) and only 10.81percent of males had studied in college.

Majority of the female and male geriatric subjects had no occupation (59.45% and 85.71% respectively) and both the gender males and females had part time employment in the old age institutions lived (24.32% and 12.69% respectively). Dawale *et al.*, (2010)<sup>[3]</sup> revealed that majority of elderly 179 (81%) were economically dependent, 164 (74.21%) of them belonged to Hindu religion, 147 (66.52%) were widow or widowers and 62 (28.05%) were falling in the age group of 80 years and above. About 34.84 percent of elderly expressed loneliness as the reason for admission.

**Socio-economic profile and mode of living of the selected geriatric subjects:**

Profile of socio economic status and mode of living included source of income, monthly income, type of old age institution, payment pattern of inmates and reason for living in old age institution was collected. Table 2 revealed that majority of the male and female geriatric subjects had no income facility (54.05% and 79.36% respectively) and very few of the geriatric subjects had access for facility of pension (18.91% and 9.52% respectively).

Majority of the selected geriatric subjects females and males had no monthly income (77.77% and 56.75% respectively) and (16.21%) of males and least of 1.58 percent of females had income range of 2000-10000 per month. The study subjects in majority lived in non-governmental organization (95%) followed by (5%) in charitable trust. In payment pattern, fully paid geriatric subjects were (86.48% and 79.36% respectively) and 5.40 percent followed by 4.76 percent had special assistance. There was significant difference observed on source of income, monthly income and type of living of the geriatric subjects.

**Table 2:** Socio-economic profile and mode of living of the geriatric subjects

Characteristics	Respondents						χ <sup>2</sup> value
	Male (n=37)		Female (n=63)		Combined (n=100)		
	N	%	N	%	N	%	
<b>Source of income</b>							
No income	20	54.05	50	79.36	70	70	0.027*
Pension	07	18.91	06	9.52	13	13	
Salary	10	27.02	07	11.11	17	17	
<b>Monthly income</b>							
None	21	56.75	49	77.77	70	70	0.011*
<2000	10	27.02	13	20.63	23	23	
2000-10000	06	16.21	01	1.58	07	07	
<b>Type of old age home</b>							
Non-government organization	37	100	58	92.06	95	95	0.078
Charitable trust	-	-	05	7.93	05	05	
<b>Payment pattern by inmates</b>							
Fully paid (food + rent)	32	86.48	50	79.36	82	82	0.376
Only rent	03	8.10	05	7.93	08	08	
Special assistance	02	5.40	03	4.76	05	05	
Free	-	-	05	7.93	05	05	
<b>Reason for living in old age institution</b>							
Own desire	05	13.51	09	14.28	14	14	0.100
Problem with children	14	37.83	27	42.85	41	41	
Destituted	03	8.10	12	19.04	15	15	
Health problems	12	32.43	15	23.80	27	27	
Others	03	8.10	-	-	03	03	

\*Significant at 0.05%

Reason for living in old age institution in majority was due to problem with children (42.85% and 37.84% respectively) and 19.04 percent females followed by 8.10 percent of males were destituted and other reasons like depression and loneliness. The pay pattern was different because the lesser aged geriatric subjects in the age range 60-69 years who were destituted worked for part in the old age home itself as gardeners, gate keepers, helpers for the geriatric subjects to perform their day to day activities and assistants in cooking and earned money. For them food was made free and only rent was made to pay through their income.

The geriatric subjects had very low income as few were dependent on retirement pension, old age pension from the government and rest from children or relatives. The special assistance charges were collected for the geriatric subjects with the age range 90 and above and also who were severely ill needed assistance to perform daily activities. Hence, there was a significant difference observed in their source of income and monthly income.

**Dietary pattern and food habits of the selected geriatric subjects**

Dietary pattern of the geriatric subjects was collected using 24 hour recall method and through framed questionnaire, which included type food, frequency of non-vegetarian food consumption and number of meals per day, skipping of meals, allergic to any food and also their preferred food consistency. Majority of female and male geriatric subjects were non vegetarians (68.25% and 67.36% respectively) and (31.74%) and (32.43%) were vegetarians due to this reason the type of diet of the geriatric subjects had a significant difference. Non vegetarian food consumption frequency was not much among female and male geriatric subjects (79.36% and 75.67%

respectively) because the old age institution followed vegetarian menu pattern and allowance was provided to consume non vegetarian foods in the weekends or monthly when they go out with their children or relatives and 6.34 percent of females consumed non vegetarian foods once in 15 days regularly because these female geriatric subjects lived in charitable trust were provided with non-vegetarian foods. Majority of the male subjects had three meals per day followed by females (90.47%) and 9.52 percent of the females had two meals per day. There was a significant difference observed among the subjects in number of meal consumption. Allergic to food was least observed in the selected geriatric subjects 2.70 percent and 1.58 percent respectively. Soft food consistency and regular food consistency provided by the old age institutions was preferred in by the majority of the geriatric subjects (53.96% and 48.64% respectively). There was a significant difference observed in consistency preferred and allergic to food by the geriatric subjects because the food provided in institutions was very soft and completely mild in taste and flavour led to have low appetite by the geriatric subjects (Table 3).

**Table 3:** Dietary pattern and food habits of the geriatric subjects

Characteristics	Respondents						χ <sup>2</sup> value
	Male (n=37)		Female (n=63)		Combined (n=100)		
	N	%	N	%	N	%	
<b>Type of diet</b>							
Vegetarian	12	32.43	20	31.74	32	32	0.943**
Non vegetarian	25	67.56	43	68.25	68	68	
<b>Frequency of consumption of non-vegetarian foods</b>							
15 days once	-	-	04	6.34	04	04	0.157
Occasionally	09	24.32	09	14.28	18	18	
never	28	75.67	50	79.36	78	78	
<b>Number of meals per day</b>							
Two/ day	-	-	06	9.52	06	06	0.050*
Three/day	37	100	57	90.47	94	94	
<b>Skipping of meals</b>							
Breakfast	02	5.40	14	22.22	16	16	0.171
Lunch	02	5.40	03	4.76	05	05	
Dinner	01	2.70	02	3.17	03	03	
Never	32	86.48	44	69.84	76	76	
<b>Allergic to food</b>							
Yes	01	2.70	01	1.58	02	02	0.700**
No	36	97.29	62	98.41	98	98	
<b>Consistency of foods preferred</b>							
Soft foods	18	48.64	34	53.96	52	52	0.607**
Regular	19	51.35	29	46.03	48	48	

\*Significant at 0.05%, \*\* Significant at 5%

Table 4 determined that the mean score of nutrients intake in male and female geriatric subjects was similar in almost all the nutrients. Nutrients intake by the geriatric subjects indicated that it was not meeting the RDA prescribed by ICMR. Hence, the results revealed that there was poor dietary intake of the food components. The reason for this is due to lack of sensing ability, poor digestion, low appetite, having high satiety value by little consumption of food and even due to depression, stress, anxiety, low income and loneliness. A study was found similar which was carried on by Komal *et al.*, (2014) (7) revealed that the mean age and nutrient intake was not sufficient as per the RDA requirements in the geriatric subjects. The change in location, environment, activities, depression, lack of efficiency of sense organs and

low appetizing meal pattern led to poor nutrients intake.

**Table 4:** Mean score of nutrient intake by the geriatric subjects

Nutrients	RDA		Respondents			
	Males	Females	Male (n=37)		Female (n=63)	
			Mean	SD (±)	Mean	SD (±)
CHO(g)	389	371	169.15	7.395	172.37	13.333
Protein(g)	60	60	28.09	1.140	28.66	2.516
Fat(g)	25	25	17.37	0.533	17.49	0.904
Energy(Kcal)	1590	1477	905.16	15.667	938.22	109.83
Calcium (mg)	600	600	365.71	5.281	367.97	11.656
Iron(mg)	17	21	11.77	0.5991	11.96	0.742

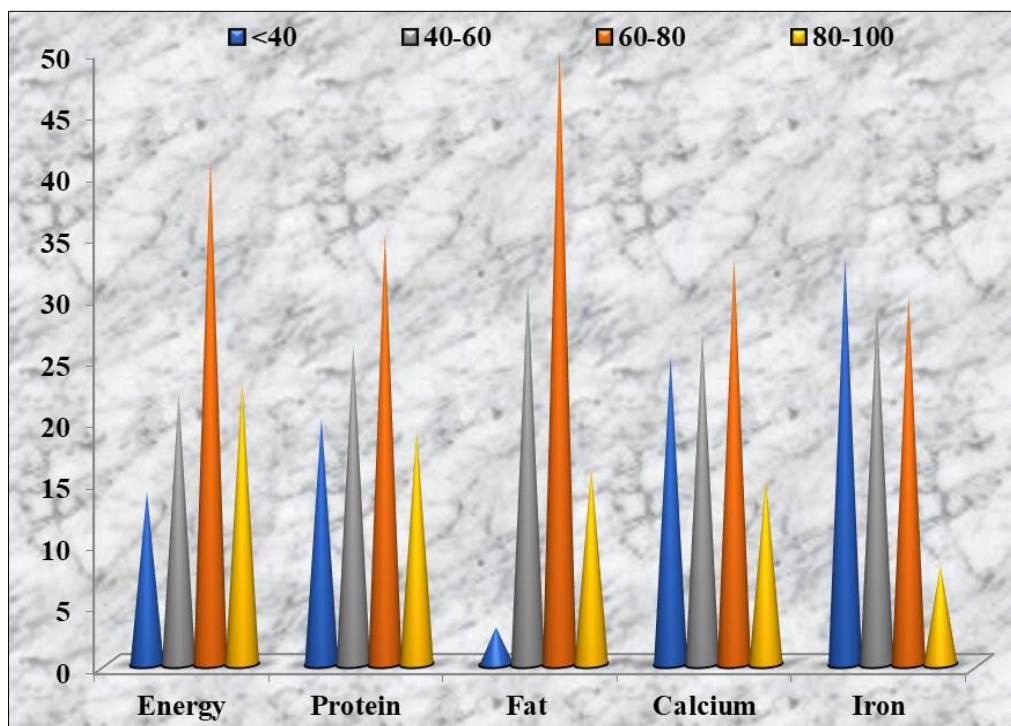
Distribution of nutrients intake by percent RDA in the

geriatric subjects is indicated in Table 5 that the majority of the geriatric subjects have 60-80 percent of nutrient intake compared to RDA and least is observed in intake of fat which is less than 40 percent. This is due to the menu followed by the old age homes where they prepared foods with very less oil and mild and more of steamed, boiled foods with minimum fat used to avoid constipation and gastric discomfort in the geriatric subjects. Kalaiselvi *et al.*, (2016) [6] analysed the dietary intake of the geriatric subjects residing in families as well as in old age homes and showed very low variety of food pattern and much repeated food ingredients were used in old age homes compared with the family dwelling led to poor RDA maintained in the geriatric subjects residing in old age

institution. Percent RDA distribution in the geriatric subjects have also been indicated in the fig. 1.

**Table 5:** Nutrient intake distribution by percent RDA in the geriatric subjects (n=100)

Nutrients	<40	40-60	60-80	80-100
	Percent			
Energy	14	22	41	23
Protein	20	26	35	19
Fat	03	31	50	16
Calcium	25	27	33	15
Iron	33	29	30	08



**Fig 1:** Percent of RDA distribution in the geriatric subjects

**Correlation coefficient of socio economic factors and nutrient intake of the geriatric subject:** The correlation coefficient between socio economic factors: age, monthly income and educational status and nutrients: protein, fat, CHO, energy, iron and calcium intake of the geriatric subjects of both the genders was determined separately.

Correlation coefficient when analysed in male geriatric subjects in Table 6 (a) between the age, monthly income, educational status and among the nutrients no significant difference was observed. Though negative correlation coefficient was found which was not significant. This result was obtained because though the geriatric subjects had prolonged age and monthly income, either they are educated or uneducated made no difference in food intake since the old age institutions provided same pattern of food to each and every individual residing in the old age institutions.

The socio economic factors and nutrient intake correlation among the female geriatric subjects residing in old age institution as per the results of Table 6 (b) found to have highly significant negative correlation because the female geriatric subjects in the study were aged more compared to

males and had monthly income high to pay for the assistance in the old age institutions. Though they paid high, it made no good impact on the food intake due to progressive age complications, the females geriatric subjects tend to consume very less quantity of food leading to poor nutrients intake. Desai and Kambale (2013) studied the health and nutritional intake of the geriatric subjects both living in family setting and old age homes and revealed the similar results indicating that the geriatric subjects though paid high in old age homes for provision of facilities were found to have poor nutritional intake compared to the ones living with the families.

**Table 6(a):** Correlation coefficient between socio-economic factors and nutrient intake of male geriatric subjects

Nutrients	Correlation co-efficient (r)					
	Males (n=37)					
	Protein (g)	Fat (g)	CHO (g)	Energy (kcal)	Iron (mg)	Calcium (mg)
Age	0.154	0.033	0.220	0.244	-0.100	0.221
Monthly income	0.029	-0.157	0.065	-0.049	-0.05	-0.236
Educational status	0.148	-0.069	0.151	0.165	0.054	-0.044

**Table 6(b):** Correlation coefficient between socio-economic factors and nutrient intake of female geriatric subjects

Nutrients	Correlation co-efficient (r)					
	Females (n=63)					
	Protein (g)	Fat (g)	CHO (g)	Energy (kcal)	Iron (mg)	Calcium (mg)
Age	-0.143	-0.149	-0.127	-0.157	-0.232	-0.174
Monthly income	-0.484**	-0.369*	-0.474**	-0.539**	-0.277	-0.412**
Educational status	0.020	0.012	0.031	0.014	0.105	0.055

\*Significant at 0.05%, \*\*Significant at 0.01%

### Conclusion

The study on the geriatric subjects residing in old age institutions revealed that the socio economic factors and nutrient intake correlation among the female geriatric found to have highly significant negative correlation as females were aged more compared males and had monthly income high to pay for the assistance in the old age institutions. Though they paid high, it had no good impact on the food intake due to progressive age complications, the females geriatric subjects consumed very less quantity of food leading to poor nutrients intake.

### Competing Interests

Authors have declared no competing interests exists.

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