

Health Assessment and Development of a Nutritious Product to Combat Malnutrition in Elderly

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Abstract: Ageing is a natural phenomenon and is invariable. As people age bodily functions and physical capabilities become less efficient. Physiological aging is a continuous process and holds an implicit recognition of two elements i.e., disease and disability. Nutrition in aged is an outcome of the earlier food habits, food choices, food likes and dislikes and also consumption pattern within the family. It is also pertinent to note that diet during illness, food beliefs, food restrictions and digestion problems during old age are major influences for nutrition during old age. Developing countries like India and China will witness increase in the population of elderly by 2025. Three major factors on which ageing depends are heredity factors, lifestyle factors and environmental factors. While heredity factors cannot be modified, lifestyle and environmental factors can be modified. The objective of study was to assess the nutritional status of elderly using anthropometric measurements, find out socio economic profile, collect information on dietary preferences and daily habits, sense of satisfaction with the role and status in their family, compare nutritional status and sense of satisfaction of elderly male and female. The study was conducted via survey method where the pre-set questionnaire was used. Random sampling was done and 100 samples from families and old aged homes were selected Hyderabad city.

The product was developed for the health benefit of elders was well accepted and easily digestible and sensory evaluation was done and lab analysis was also done and it was qualitatively and qualitatively perfect for elderly.

Index Terms - Health assessment, old age homes, Homes, Malnutrition, and Nutritious product

I. INTRODUCTION

Ageing is not a disease but biological processes. Individuals are known to age at different rates. Genetics, race, gender, heredity and good nutrition

may slow ageing process. Successful ageing is defined not by life span alone but also by sufficient well being in multiple domains socially, physically and mentally. Three components for successful ageing are avoid disease, engagement with life, and maintain high cognitive and physical function.

Process of ageing brings about physiological, psychological and immunological changes which influence nutritional changes. Degenerative changes perhaps lead to cancer, cataract, atherosclerosis, arthritis, osteoporosis, Parkinson's disease ECT. Inability to prepare food decreased purchasing capacity and psychological problems adversely affect the health and nutritional status of elderly. Fatigue may be due to co-existing disease, blunting of taste may be due to degenerative changes in parietal lobe of brain. In old age due to consumption of less calories, DM, BP and anemia may result in giddiness. (Srilakshmi. B 7th edition, new age international publishers, chapter 9, page number 145-162)

1.1 Nutritional Requirements

Physiological changes associated with advancement in age have a potential impact on the diet and nutritional status of older persons. Elders are at risk of poor nutrition for number of reasons, like poor dentitions, economic pressure, depression, reduced mobility, loneliness ageing tissue, inadequate food consumption, poor quality of diet and ignorance. Nutritional requirements of older people are discussed below:

1.2 Energy:

In the elderly, energy expenditure may be affected in several ways, the important of which are: The basal metabolic rate, BMR, Changes in the amount of physical activity and alteration in the efficiency of

muscular activity, and movement. After 35 the basal metabolic rate decreases due to reduced muscle mass and other metabolically active tissue mass. The percentage of muscle tissue decreased, and fat tissue increased. As the age increases resting metabolic rate decreases approximately 15 - 20percent over the life span, primarily due to changes in body composition and physical activity. A reduction in BMR of about 10%probably occurs between the age of young adult hood and about 60 years and another 10% decline occur by the age of 75 years. Thus, caloric requirement decreases with increase in age, to about 25 % less than normal adults doing sedentary work. The caloric requirement for elderly male is 1800 k.cal and elderly female is 1400 k.cal. (ICMR- RDA 1995) the caloric intake should be adjusted to maintain constant body weight (normal BMI).Although energy requirements decrease the requirements for protein, vitamins and minerals do not diminish.

1.3 Carbohydrates:

As impaired glucose intolerance in the elderly can lead to hypoglycemia, hyperglycemia, and type II diabetes mellitus. Insulin sensitivity can be enhanced by balanced energy intake, weight management and regular physical activity. Emphasis is placed on increasing the consumption of complex carbohydrates and controlling the intake of simple sugars. It is necessary that at least 50 % of caloric requirement is from carbohydrates. Since caloric requirement is reduced, carbohydrate intake is also reduced.

1.4 Protein:

There is a decrease in skeletal muscle mass as the age increases. This result in decrease in protein provided by skeletal muscle and may be inadequate to meet the needs of protein synthesis. Dietary protein is necessary, and the recommended allowance of protein is 60 gm /day for male and 50 gm /day for female(ICMR 1995).A protein intake of 1 gm/kg ,is safe during old age. The food should be rich in protein compared to normal adult. Protein foods such as milk and curd can be included.

1.5 Lipids:

The diet should contain 40 - 50 gm of fat, half should be in form of vegetable oil rich in omega -6 and omega- 3 fatty acids. High intake of fat is the risk factor for cardiovascular diseases and dementia.

1.6 Minerals:

Calcium absorption efficiency declines with age, calcium needs increase. Women over 50 years of age who are deficient in estrogen require more calcium as there is demineralization of bone and osteoporosis. Minimal or moderate deficiency of calcium intake may contribute to occurrence or accentuation of weakening of the bone. the recommended daily intake of calcium for elderly is 400 mg/day (ICMR 1995). Women need 800 mg/day to compensate age related bone loss and improve calcium balance. Food sources rich in calcium are milk, ragi, drumstick leaves, prawn, crab and small fish. To avoid iron deficiency anemia, older persons should include green leafy vegetables, wheat flour jaggery, honey or dates in their daily diet. The recommended intake of iron is 28 mg/day for male and 30 gm / day for female respectively. Trace elements like zinc, iodine, copper, chromium and magnesium are also required for wide range of functions in the body good source of these are fleshy foods, cereals, pulses, Brewer's yeast ,nuts and fruits.

1.7 Vitamins:

Elderly people are at a risk for vitamin- D deficiency due to decreased exposure to sunlight or decreased renal mass. Calcium and vitamin-D supplementation improves bone density and may prevent fractures in elderly people. the vitamins which are likely to be in inadequate amounts in the diets of elderly are some of B group vitamins, vitamin C, D and A. ICMR recommends a daily allowance of vitamin A and C as 2400 mg/day and 40 mg/day respectively. Stress, smoking and some medications can increase vitamin C requirements. The anti oxidant vitamins such as vitamin E, A and C are agents that enhance the health of elderly.200mg of vitamin E improves cellular immune system. Deficiency of vitamin B₆ causes immune dysfunction. Supplementation with vitamins and poly unsaturated fatty acids provides protection against UV light. Supplementation may boost cell mediated immunity.

1.8 Water:

It is essential for elderly person. The kidney can function more adequately when there is sufficient fluid (1.5l) to eliminate wastes from body. It stimulates peristalsis, it prevents constipation. Water can be

consumed as such or in the form of butter milk, fruit juices, porridge and soups.

1.9 Fiber:

It is the name given collectively to indigestible carbohydrates present in foods. It can absorb and hold water and thus act as a valuable bulking agent, increasing transit time in gut. Hence dietary fiber plays an important role in prevention of constipation and also lowers blood cholesterol level. High intake of fluids is essential with fiber food. Increase should be gradual otherwise bowel discomfort, suspension and flatulence will result. There is good deal of fibrous material in millets, ragi, horse gram, and rice bran. There is plenty of roughage in greens, plantain stem, cabbage, cauliflower, dates, mangoes, figs etc. Excess of fiber may reduce the absorption of iron and certain trace elements.

Diseases like diabetes, atherosclerosis, cataract formation, Parkinson's disease, cancer and strokes may affect nutrient intake, digestion, metabolism and excretion. (Srilakshmi. B Dietetics.)

II.REVIEW OF LITERATURE

2.1 Effectiveness of mealtime interventions on nutritional outcomes for the elderly living in residential care: a systematic review and meta-analysis.

A study was conducted by Abbot et al, in the year 2013 on the effectiveness of mealtime interventions for older people living in residential homes to identify which intervention will be more useful. The study showed that mealtime interventions could be one of the effective components to improve nutrition of elderly people living in long term care. The way in which the food was served to residents, the nature of room in which they eat, availability of food choices and meal assistances were the components which affected the nutrition of elderly. The study concluded that mealtime interventions are effective methods to improve nutrition of the elderly people living in a residential care home.

Key words: Mealtime, Residential homes, older people, Nutrition

2.2 Assessment of the nutritional status of the elderly and its correlates

A study was conducted by Anku moni saikia in the year 2013. The main aim of the study is to determine nutritional status of elderly in terms in terms of BMI. The objective of the study is to determine the anthropometric measurements and nutritional status. Cross sectional method of study was adopted. In conclusion a high prevalence of under nutrition was found in elderly living in urban slums. However, a significant observation was reasonably high prevalence of over nutrition in this unprivileged group. Further studies are needed in this field.

Key Words: Anthropometric, Nutritional status, Urban slums

2.3 Status dietary pattern and physical work capacity of geriatric population residing in homes and old age homes a comparative study

A study was conducted by Bhatnagar and Ruchi in 2019 on nutritional status, dietary pattern and physical work capacity of geriatric population residing in homes and old aged homes, a comparative study was conducted in Uttarakhand, multistage sampling technique was used for selection of sample (13 districts), 100 males and 108 females were selected for study from each district. The dietary intake of elderly subjects was assessed using 24 hours dietary recall method for 3 consecutive days, anthropometric measurements, clinical exams were conducted, the result of analysis showed (widows 41.5%, widower 27.27, and unmarried respondents) not everyone ages with same speed and in same manner. Physiological, psychological, socio economic, cultural, spiritual, educational factors influence the quality of ageing. Urbanization and modernization further worsen the condition of elderly people in the family. Elderly is considered as a burden; these forces them to refuge in institutions like old age homes.

Key Words: Geriatric, population, Anthropometric, Clinical

2.4 Overall support and support from colleagues and family members on old age people.

A study was conducted by Chaudhary in 1992 on overall support and support from colleagues and family members on old age people. The persons feel

neglected and humiliated. This may to the development of psychology of isolation the company of others. The older people begin to feel even his children do not looked upon him that degree of respect which he used to get some earlier. This may leads to loneliness and feel sick. The results showed that loneliness in turn may give rise to depression and may eventually lead to worsening of sickness.

Key Words: Psychology, Isolation, Loneliness, Depression.

2.5 Dietary patterns of elderly and nutritional status and lifestyle.

A study was carried by Ferraiar MPN in year 2017 in Brazil. The main aim of the study was to determine the dietary patterns and associated factors among elderly. The objectives of the study were to examine the dietary patterns of elderly and nutritional status and lifestyle. A descriptive cross sectional study method was used in the study. It was concluded that traditional dietary patterns of elderly and lifestyle affected the nutritional status municipal level studies identified the differences that could not be identified in national studies.

Key Words: Dietary pattern, Traditional, Nutritional status, National studies

III. METHODOLOGY

3.1 AIM:

To access nutritional status of elderly residing in residential homes and old age homes and develop nutritional product to combat malnutrition.

3.2 OBJECTIVES:

- To access nutritional status of the aged using anthropometric measurements
- To study health concerns of the aged
- To study psychological problems of aged
- To note the misconceptions about food among aged
- To study relation between economic status and nutrition
- To compare nutritional status of aged male and females
- To Prepare a nutritional supplement.

3.3 METHODOLOGY:

- Research design: Nonexperimental design of the study is in the following flow chart.
- Research approach: Comparative study
- Selection of area: A cross sectional study was performed from different old age homes of Hyderabad and also elders living with their families in Hyderabad.
- Selection of sample: Through random sampling, 100 samples for survey were elders living in old age homes and also living with their families.
- Duration of study: The study has been carried for a period of 3 months.
- Collection of data: Questionnaire - It contains general information, anthropometric information, nutritional assessment, financial assessment, medical assessment, and status in family. The questionnaire contains both open ended and close ended questions.
- General information: Personal information of respondent like name, gender, occupation was collected.
- Anthropometric measurements: Details of respondent like height, weight was measured, and BMI was calculated using formula
- $BMI = \text{weight (kg)}/\text{height (m}^2\text{)}$.
- Data analysis: The collected data was tabulated and analyzed using statistical formula, such as chi-square test and the result was significant, and hypothesis was proved

IV. RESULTS AND DISCUSSION

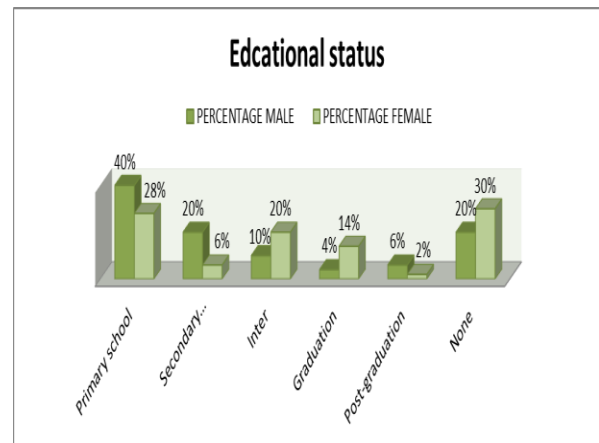


Figure 4.1 shows percentage of educational status of male and female elders

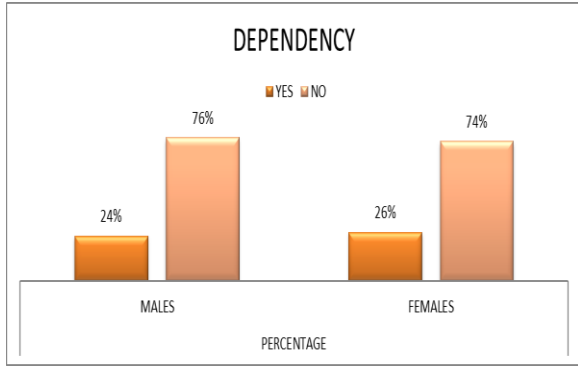


Figure 4.2 shows percentage of dependency of male and female elders.

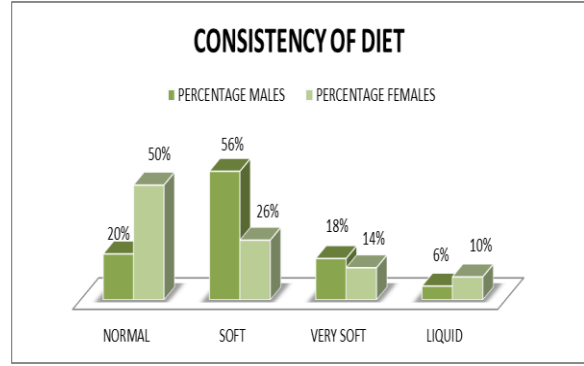


Figure 4.4 shows percentage of consistency of diet of male and female elders.

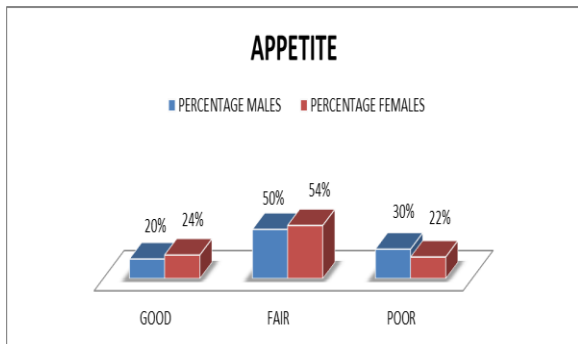


Figure 4.3 shows percentage of appetite of male and female elders.

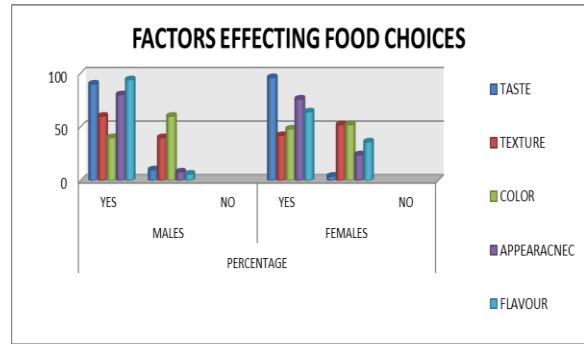


Figure 4.5 shows percentage factors effecting food choices of male and female elders.

Table 4.6: Distribution of subject based on body mass index

BMI	Males	Females	Percentage	
			Males	Females
Underweight	2	5	4%	10%
Normal	15	5	30%	10%
Overweight	23	20	46%	40%
Obese	10	20	20%	40%

Table 4.7: Distribution of subject based on special diets

Special Diet	Males		Females		Percentage			
	Yes	No	Yes	No	Males		Females	
					Yes	No	Yes	No
Renal	15	35	10	40	30%	70%	20%	80%
Diabetic	38	12	42	8	76%	24%	84%	16%
Cardiac	39	11	43	7	78%	22%	86%	14%

Table 4.8: Distribution of subject based on misconception of foods

Misconception of Foods	Males		Females		Percentage			
	Yes	No	Yes	No	Males		Females	
					Yes	No	Yes	No
Cereals	7	43	4	46	14%	86%	8%	92%
Pulses	13	27	25	25	26%	74%	50%	50%
Milk	13	37	8	42	26%	74%	16%	84%
Milk Products	20	30	15	35	40%	60%	30%	70%
Vegetables	3	47	5	45	6%	94%	10%	90%

Fruits	14	36	15	35	28%	72%	6%	94%
Egg	10	40	20	30	20%	80%	28%	72%
Poultry	13	37	18	32	26%	74%	20%	80%
Meat	7	43	7	43	14%	86%	36%	64%
Sea Foods	4	46	2	48	8%	92%	4%	96%

Table 4.9: Distribution of subject based on number of meals consumed

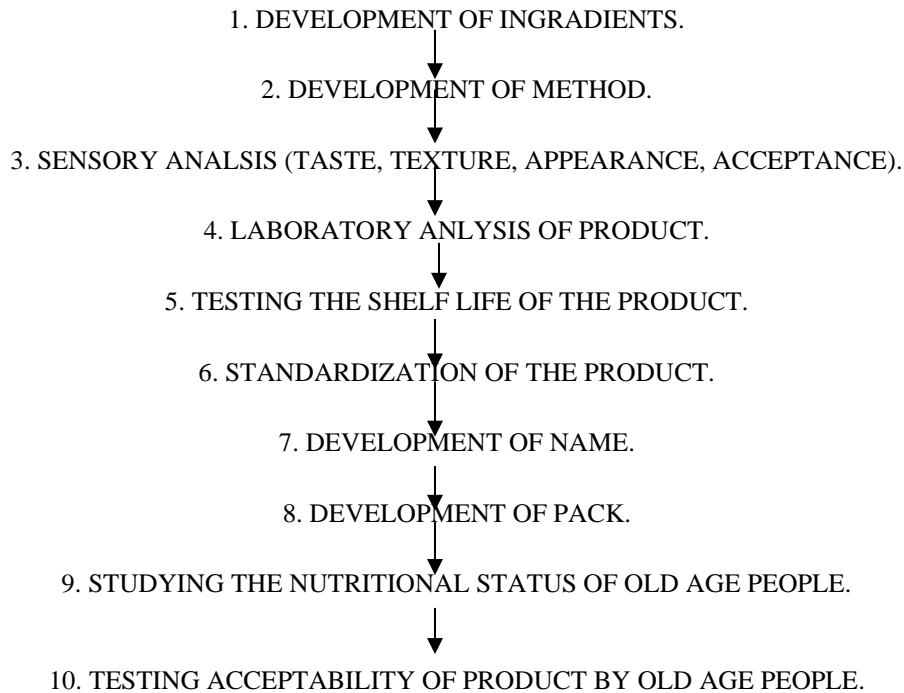
Number Of Meals	Males	Females	Percentage	
			Males	Females
One	1	3	2%	6%
Two	13	29	26%	58%
Three	27	11	54%	22%
> Three	10	7	20%	14%

Table 4.10: Distribution of subject based on depression

Deprission	Males	Females	Percentage	
			Males	Females
Yes	23	37	46%	74%
No	27	13	54%	26%

METHODOLOGY

PRODOCT DEVELOPMENT



PRODUCT DEVELOPMENT

(REGEN- NUTRI-NOURISH)

TABLE 4.11 (INGRADIENTS FOR 20 SERVINGS)

S.No	Ingradient	Weight
1	Corn Flakes	100 gm

2	Rice Flakes	100 gm
3	Wheat Flakes	100 gm
4	Ragi Flakes	100gm
5	Bengal Gram Puffed	50 gm
6	Cashew Nut	25 gm
7	Almonds	25 gm

8	Resins	25 gm
9	Dates	25 gm
10	Dried Fig	25 gm
11	Flax Seeds	25 gm
Total (20 Servings)		600gm

**NUTRITIVE VALUE OF PRODUCT
CALCULATED (100 gm)**

Carbohydrates	358 gm
Proteins	59 gm
Fats	33 gm
Iron	4.2 mg
Calcium	61.8 mg
Fibre	15 mg

LAB ANALYSIS OF PRODUCT (100 gm)

Carbohydrates	298 gm
Proteins	42 gm
Fats	25gm
Iron	3.4mg
Calcium	51.1mg
Fibre	35mg

**SENSORY EVALUATION OF PRODUCT
(OUT OF 5 POINTS)**

Color	4.5
Texture	4.5
Flavor	5
Taste	5
Appearance	4.5

V. SUMMARY AND CONCLUSION:

Old age is best defined as the age of retirement that is 60 years and above. Successful ageing is defined not by life span alone but also by sufficient well-being in multiple domains- socially, physically and mentally. The three components of successful ageing are avoiding disease, engagement with life and maintaining high physical and cognitive functions.

The objectives of the study is to assess the nutritional status of elderly living with families and in old age homes using anthropometric measurements, find out socio economic profile, select information on dietary preferences and daily habits, sense of satisfaction with the role and status of elderly living with families and in old age homes.

Study was conducted on nutritional status of elderly and a nutritional product was developed for them, the sample size selected for this research is 100, 50

subjects from old age home and 50 subjects living with families. Samples were randomly selected. The study was conducted via survey and the questionnaire based on questions including anthropometric measurements, socioeconomic profile, dietary preferences and daily habits and sense of satisfaction with their role in their families.

5.1 General Information

Among the male elders 4% are under weight, 30% are in normal weight, 46% are over-weight and 40% are obese. Among the female elders 10% are under weight, 10% are in normal weight, 40% are over-weight and 40% are obese.

The educational status of male elderly showed that 40% are educated up to primary school, 20% up to secondary level 10% up to intermediate, 4% are graduates, 6% are post graduates and 20% are illiterate where as the educational status of female elderly showed that 28% are educated up to primary school, 6% up to secondary level, 20% up to intermediate, 14% are graduates, 2% are post graduates, 30% are illiterate. If we compare the educational status the male elderly are having better educational status than female elderly.

70% of males and 60% females lived with spouse, 4% of males and 2% females were divorced, 6% males 4% females were single and 20% Of males and 34% females lost their spouse. 26% male and 34% female stay with family, 50% male and 40% female stay with spouse 4% male and 2% female stay alone, 14% male and 20% female stay in old age homes.

10% of males and 2% of females are government employees, 2% of males and 50% of females are not employed, 64% males and 40% females are retired, 24% males and 8% females are self employed. 60% of male and 36% get pension, 12% men and 6% women get money from rents, 8% males and 50% females receive money from children, 20% males and 8% females earn money from business. 90% of male and 50% of female have personal bank account, 10% of male and 50% of female did not have personal bank account. 24% of males and 26% of females feel dependent, 76% males and 74% females feel they are not dependent.

80% of male and 74% of female are socially active, 20% of male and 28% of female are socially inactive. 70% of males and 84% of females are physically active, 30% of males and 16% of females depend on others for their day to day works.

46 % of males and 74% of females are depressed, 54% male and 26% of females are not depressed. women are feeling sense of loneliness than men.

5.2 Nutritional Assessment

- The appetite of elders 20% of male 24% of female had good appetite, 50% male and 54% female had fair appetite, 30% male and 22% female had poor appetite.
- Type of diet preferred by elders: 6% males and 10 % females are vegetarians, 40% male and 26% female are non vegetarian, 34% male and 40% female are lacto vegetarian, 20% male and 24% female are ova vegetarian.
- The diet taken at regular time by elders: 14% of males and 10% females take meals at regular time, 40% and 20% female often take meals at regular time ,6% males and 20% females sometimes take meals at regular time,40% males and 50% females hardly take meals at regular time.
- The consistency of diet preferred by the elders: 20% males and 50% females liked normal diet, 56% males and 26% females liked soft diet, 18% males and 14% females liked very soft diet, 6% males and 10% females were on liquid diet.
- Dietary pattern of elders in a day: 2% males and 6% females had one meal in a day,26% males and 58% females had two meals in a day, 54% males and 22% females had three meals in a day,20% males and 14% females had more than three meals a day.
- The habit of skipping meals in elders: 26% of males and 64% of females skipped meals especially breakfast, 74% males and 36% females did not skip meals.
- Number of glasses of water consumed by elders daily: 20% males and 6% females consumed less than three glasses of water, 56% of males and 54% of females consumed 3 to 4 glasses of water,14% of males and 24% of females consumed 5 to 6 glasses of water, 6% males and 6% females consumed 7 to 8 glasses of water, 4% males and 6% females consumed more than 8 glasses water.
- The weekly food preferences of elderly: 90% males and 76% females preferred all types of vegetables, 68% of males and 58 % of females preferred all kinds of fruits,74% male and 40%

female consumed milk and its products, 60% males and 50% females consumed eggs, 40% males and 20% females preferred poultry, 34% males and 26% females preferred meat, 30% males and 20% females preferred sea foods .

- The factors influencing food choices of elders: 90% males and 96% females made choice on basis of taste, 60% males and 42% females food choice on basis of texture, 40% males and 48 % females made color choices of food, 80% males and 76% females made food choice on basis of appearance, 94% males and 64% females selected food on basis of flavor. Different types of misconceptions were found in both males and females.
- The percentages of elders on special diets: 30% of males and 20% of females are on renal diets, 76% of males and 84% of females are on diabetic diet, 78% of males and 86% if females are on diabetic diet.
- The change in percentage of food habits of elders: 80% of male and 50% of female have changed food habit.20% of male and 50% of female did not change their food habit.

5.3 Medical Assessment

The prevalence of general illness in elders: 40% of males and 76% of females suffer from headaches, 70% of males and 60% of females suffer from body pains, 60% of men and 50% of females suffer from reduced sleep, 50% Of males and 20% of females suffer from anorexia, 78% of male and 40% of female suffer from constipation, 74% of male and 64% of male suffer from acidity, 64% of male and 34% of female suffer from breathlessness, 50% of males and 40% of females have less immunity and are prone to recurring sickness.

The medical conditions prevalent in elders: 92% males and 78% females suffer from blood pressure, 96% of male and 84% of female suffer from diabetes, 84% male and 80% female suffer from cardio vascular problems, 49% male and 30% female suffer from nervous problems, 30% male and 24% female suffer from renal problems, 54% male and 46% female suffer from respiratory problems, 76% males and 90% female suffer from joint pains especially knee pain, 80% male and 64% female suffer from vision

problems, 76% male and 36% female suffer from dental problems.

Assistance needed by elders for doing daily activities: 70% of male and 30% of female need help for taking medications, 32% men and 45% female need help during eating food, 38% male and 4% female need help while walking, 30% males and 4% females need help while using toilet, 20% male and 4% female need help while dressing, 10% men and 4% female need help while bathing, 20% men and 70% women need help while going out, 6% men and 4% female need oral care.

Percentage of elders who have regular health checkups, 80% males and 60% females have regular checkups, 20% male and 40% female do not have regular checkups.

The daily intake of medicines by elders, 90% males and 96% females take medicines regularly, 10% males and 4% females some times for get to take medicines.

5.4 Financial Assessment

The percentage of elders who need financial assistance, 16% males and 70% females need financial assistance, 84% males and 30% females do not need financial assistance.

The medical insurances of the elders, 40% males and 20% females had medical insurances, 60% males and 80% females did not have any medical insurances.

Food expenses of elders, 72% men and 24% females were able to expend money for food and 28% males and 76% females depended on others for food needs.

The ability to pay bills by elders, 64% of males and 30% of females were able to pay their medical bills, 36% males and 70% females found it difficult. 72% males and 24% females had ability to buy medicines, 28% males and 76% females found it difficult, 72% males and 20% females could pay transportation bills, 80% males and 30% females paid their telephone bills, 76% males and 26% females could pay rents, 80% males and 30% females could pay other types of bills.

5.5 Family Status

The percentages of elders living with family, 76% males and 74% females lived with family, 24% males and 26% females did not live with family.

The percentage of elders spending time with family members. 70% of males and 74% of females spend

time with family members, 30% males and 26% females do not spend time with family.

The percentage of elders taking meals with family, 74% males and 52% females take meals with family, 26% males and 48% females do not take meals with family.

The percentage of elders receiving respect from family members, 80% males and 74% of females receive respect from family members, 20% males and 26% females feel that they are not respected.

The percentage of elders involvement in the family decisions, 76% male and 66% female involve in decisions of family, 24% males and 34% females do not involve in family decisions.

The percentage of elders receiving health care from family members, 80% males and 68% females get health care from family, 20% males and 32% females do not get health care from family.

The percentage of elders experiencing a sense of losing authority on family, 40% of males and 80% females sense they are losing authority on family, 60% males and 20% females do not feel they are losing authority on family.

The percentage of elders needing help from family, 20% males and 16% females need physical help, 30% male and 76% female need financial help, 50% male's 60% females need nutritional help, 20% male and 30% female need emotional help from the family.

5.6 Product (Regen Nutri Nourish)

Viewing the data collected a product was developed using the cereal, pulse and dry fruit and nut based easy to eat product which could be eaten as a breakfast cereal or as an in between meal, it was assessed for its nutritional quality.

The nutritive values calculated using nutritive tables, 1 serving of 30 grams of product had 118.6 k.cal energy, 24.49 grams carbohydrates, 3.55 grams proteins, 1.98 grams fats, 37.08 mg calcium and 2.54 gm iron.

The product was assessed for sensory qualities and digestibility in various old age homes, and elders living in families, 95% people liked its appearance, taste and texture and rated it as 4.5 out of 5. 85% of elders said they had easily digested it.

The product is given with milk and it can also be made as laddu, the product can be used for children and adults also, it provides energy and proteins and can aid in malnutrition of children as well.

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