

NUTRITIONAL PROFILE AND PROBLEMS OF OLD AGE

By

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**A Thesis submitted to
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Doctor of Philosophy**

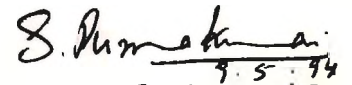
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**DEDICATED TO THE MEMORY
OF MY BELOVED
MOTHER**

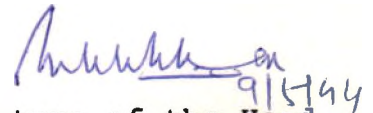


CERTIFICATE

This is to certify that this thesis entitled "Nutritional Profile and Problems of Old Age" submitted to the Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University) Coimbatore, for the award of the Degree of Doctor of Philosophy in Food Science and Nutrition, is a record of original research work done by Mrs. K.P.VASANTHA DEVI, M.Sc., M.Phil., during the period of her study in the Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University), Coimbatore, under my supervision and guidance and the thesis has not formed the basis of the award of any Degree/Diploma/ Associateship/Fellowship or similar title to any candidate of any University.


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DECLARATION

I hereby declare that the matter embodied in this thesis is the result of investigation carried out by me in the Department of Food Science and Nutrition, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University) Coimbatore, under the supervision and guidance of Dr. (Mrs.) S.PREMAKUMARI, M.Sc. M.Phil., Ph.D., Dip. Ed. (Madras), Reader in Food Science and Nutrition, Faculty of Home Science, Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University) Coimbatore, and it has not been submitted for award of any Degree/Diploma/Associateship/Fellowship or similar title of any other University or Institute.

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Introduction

I. INTRODUCTION

Ageing truly can be a jewel in the mosaic of life

- Robert Browning

Every human being passes through various stages in his life-time which comprises childhood, youth, maturity and old age. About one fourth of man's life is spent in growing up and preparing for active participation in society, one half in a variety of activities in an attempt to gain happiness and the final quarter in a progressive process of reduced activity leading to physical decline followed by inevitable death.

'Elderly' or 'old people' are generally the people above the age of 60 (Singh, 1992; Dhar, 1992; Goyal, 1992; Gore, 1992; Sinha, 1993; Ramana, 1993; Ranade, 1993; and Thimmayamma, 1993). It is estimated that there would be 620 million people over 60 years by 2000 A.D. in the world and 1.2 million would be added in another 25 years, with almost 58 per cent of the aged living in Asia and only 12 per cent in Europe. More than half of the world's elderly people are in the developing countries and India currently ranks fourth among the countries which have a large elderly population in absolute numbers (Davies, 1989 and Chopra, 1989).

There were 20 million people in India beyond 60 years of age in 1951; this figure rose to 43.2 million in 1981; and it is expected to touch 75 million by the turn of the century (Ghoshal, 1989). The number is bound to increase rapidly since life expectancy, which was 32 years in 1947 has gone up to 60.1 for males and 59.8 for females in 1991 (Goyal, 1992; Malayala Manorama Year Book, 1994).

The aged are the symbol of traditions, respect, wisdom and experience. They are considered to be the best source of social education, social service and social cohesion. Their experience and perceptive ideas are invaluable assets for the development of the community. The elderly are a prize asset to the country and their health is an important component of the nation (Sahni, 1987).

In India old age evoked deep respect and honour in the traditional society. The traditional Indian families were mostly joint, which was truly socialistic. The able-bodied adults earned the livelihood for all while the infirm and the aged were looked after within the joint family. However, it is a known fact that most of the aged suffer in the process of growing old and become overwhelmed by the unfavourable atmosphere when they are confronted with the problems of finance, physical security, loneliness and isolation. The old age ailments like failing eyesight and

hearing capacity, slow and faulty steps, declining energy and forgetfulness make their life more miserable with a feeling of being unwanted and a sense of neglect. With the advancing age, when they lose many things including friends, spouse, power, influence, income and health, they become intolerant, short-tempered and sentimental. The nature and severity of the problems of the aged may differ from family to family, group to group and area to area.

One of the major needs of old age is appropriate nutrition because good health in old age will be economically and socially advantageous to the society. In old age, consumption of good diet is the greatest single factor in preventing senility, increasing life span and the period of vigorous activity.

Malnutrition among the aged is caused by a number of factors such as condition of the family, poverty, ignorance, superstition, lack of food, poor environmental sanitation, undesirable social customs, traditional prejudices and frequent infections (Sharma, 1986 and Chopra, 1989). Nutritional deficiencies play an important role in the occurrence of and susceptibility to diseases. Some of the diseases of the aged tend to aggravate due to restricted choice of foods as a result of missing teeth, faulty dentures, slow digestion and diminished taste.

Reduced income limits the quantity and variety of foods purchased by the elderly. Many elderly people buy less expensive and high carbohydrate foods that are lacking in certain nutrients. When the foods tend to be monotonous elderly people start skipping their meals.

Deficiencies of vitamins B, C, and D and minerals like iron and calcium occur more often in the older people. Dietary surveys indicate that calcium is one of the nutrients most frequently lacking in the diets of older persons (Krishnaswamy, 1986).

Apart from nutritional deficiencies, major diseases like hypertension, diabetes mellitus, cardiac failure, arthritis and non-specific complaints like extreme weakness, debility, poor appetite, bone pains, generalised muscular pain, lack of energy and tiredness affect old people (Natarajan et al., 1987).

Nair (1989) and Umesh and Sood (1989) have stated that fever, cough, cold, high blood pressure, muscular and stomach pain, respiratory and eye defects are the problems among the rural aged. Reddi and Padmini (1989) have reported that men have more problems in almost all areas of life than women, as women socialise better than men and in the majority of cases, there is no occupational hazard since they are originally confined to the home.

Aged people in rural areas have less facilities than the aged of urban areas; the aged in rural areas are economically more vulnerable; and the majority of the elderly in rural areas are without any income (Goyal, 1992 and Ranade, 1993). Apart from the basic problems like food, housing and health, the aged people also face social, psychological, family, personal and occupational problems.

In India, where child population is to the extent of 40 per cent and malnutrition and under-nutrition among the vulnerable groups are high, attention has been all along focused on the promotion of health and nutrition of the younger age groups. A number of nutrition programmes have been initiated in India to improve the health and nutritional status of the vulnerable groups including pre-schoolers and expectant and nursing mothers. However, the aged have not been adequately brought under the welfare programmes. In Tamil Nadu, the Government provides free midday meals for the needy aged and also Rs. 50 per month as old age pension. The old age pensioners also receive a free saree/dhoti once a year (Sahni, 1987). The Welfare Ministry of Central Government has recommended a pension^S of Rs.100 per month to those over 60 and destitutes (Raj, 1992).

For initiating any type of developmental programmes for this group of population, the most essential requirement is

research evidences on the dimensions of the existing nutrition and health problems, the interacting factors and concrete suggestions and recommendations. However, the major part of nutritional research in the country hitherto had been focused on only children and pregnant and lactating mothers. Nutritional research relating to the aged population has been almost totally ignored. If this negligence continues further in the country, the Government will face an accumulated nutrition problems of the aged, as the aged population is increasing due to gradual increase in life expectancy.

In an effort to fill this existing lacuna in information on the aged, the present investigation was undertaken to study the nutritional profile and problems of the aged and the factors affecting the well-being of the aged in the selected rural and urban areas in Anna District of Tamil Nadu. Through the findings of this investigation concrete suggestions would emerge towards planning social security and health and nutrition measures for the aged. This study may pave the way for more voluntary organizations to come forward to help the aged towards improving their social and economic condition.

OBJECTIVES OF THE STUDY

The major objective of the study was to assess the nutritional status and the problems of the aged in selected areas of Dindigul - Anna District.

The related objectives were: To

1. assess the socio-economic background of the aged;
2. study the dietary and food consumption patterns of the selected aged;
3. determine the nutritional status of the selected aged; and
4. analyse the problems of the aged-social, economic, health, physiological and psychological.

THE VARIABLES TESTED WERE

1. Subject variables : age, sex, education, occupation and income and
2. Situational variables : Rural and Urban.

It is hoped that the finding of the study will pave the way for undertaking further investigations regarding the aged.

Review of Literature

II. REVIEW OF LITERATURE

The literature pertaining to the present study entitled "Nutritional Profile and Problems of Old Age" is reviewed under the following headings:

- A. Nutritional requirement and intake of the aged
- B. Nutritional and health disorders of the aged
- C. Factors affecting food consumption of the aged
- D. Problems faced by the aged and
- E. Assessment of nutritional status of the aged.

A. NUTRITIONAL REQUIREMENTS AND INTAKE OF THE AGED

1. Nutrient Requirements

In old age consumption of suitable diet is the greatest single factor in preventing senility, increasing life span and the period of vigorous activity (Kumar, 1985 and Noel and Ames, 1989). Hence, proteins, fats, carbohydrates, vitamins and minerals have their place in the diet of the aged as discussed below.

a. Energy

An important bodily change taking place with advancing age is a decrease in the number of functioning cells (Sehgal, 1981; Dutta and Paul, 1983 and Krishnaswamy, 1986). This results in a decrease in the metabolic processes of the body, including activities of the heart, respiratory and urinary system. Therefore, as age advances, energy needs of

the body are reduced. According to Gambert (1983) there is a mild but progressive reduction in physical activity from the age 20 to retirement. The reduction in lean body mass and increase in fat tissue results in decreasing caloric requirement with advancing age (Arora and Rudman, 1988; William and Rosenberg, 1991 and Johnston, 1992).

The Food and Nutrition Board proposes a five per cent reduction in energy allowance per decade between ages 35 and 55 years, eight per cent reduction per decade from age 55 to 76 years and further decrement of 10 per cent is recommended for age 75 years and beyond (Antia, 1984). As people grow older they tend to eat less and thus compensate to some extent for the reduced energy needs (Wilson, 1981). Generally 30 cal/kg body weight are needed but for an active older person the requirement may go beyond 2000 Kcal/day (Sehgal, 1981).

b. Protein

The recommended allowance for protein is one gram per kg body weight from young adults to old age - 18-75 years and protein should provide 10 per cent of the energy requirement (Dutta et al., 1983). As a result of decreased appetite and poor digestive capacity, old people are likely to consume less protein leading to protein deficiency, anaemia and lowered resistance to infection

(Vijayalakshmi, 1988). Food relatively higher in protein content is needed in old age because energy need decreases (Wilson et al., 1968). Older persons who live alone may eat carbohydrate foods in excess because they are easy to chew, require no preparation and are inexpensive. Milk intake is poor because it is considered to be constipating or gas producing food (Robinson and Lawler, 1982).

c. Fat

The diets should include atleast 50 g fat and half this quantity should be in the form of vegetable oil, rich in essential fatty acids (Swaminathan, 1974). Nutritional evidence points to a need for dietary fats being 15 to 20 per cent of total calories for the old people (Agarwal, 1987). In a study of Cohort of male executives 180 were assessed twice during 15 years and they showed a decline in energy intake, particularly of fat and also showed the changing trend in the intake from saturated to poly-unsaturated dietary fats (Flahi et al., 1983). Natarajan et al. (1989) reported a mean fat intake of 23.74g and 22.2 g per day for elderly females and males respectively.

d. Minerals

The requirement for minerals do not increase because of age and they remain the same as for the adult (Sehgal, 1981). Since demineralisation of bone is present among the

aged persons calcium intake should not be less than 500 mg (ICMR, 1989). Iron needs of women lessen after menopause but even mild anaemia affects the health of old people. The recommended allowance of iron is 20 mg for male and 30 mg for female (ICMR, 1989).

e. Vitamins

The requirement for vitamins is not markedly changed in old age, but apparently, greater attention must be paid to an adequate diet supply, since a diminished total food intake and poor selection of foods may lead to less efficiency absorption (Sehgal, 1981).

The Food and Nutrition Board makes no differentiation in the recommended allowances for vitamins A and ascorbic acid but recommends decreased need for thiamine, riboflavin and niacin with concomitant lower energy need. According to ICMR (1989) it is essential to have 400 I.U. of vitamin D in the diet as it will help in the absorption of calcium to prevent osteoporosis to some extent.

f. Water and Fibre

Water helps the skin from drying out and cracking. Water is also necessary for cooling the body. It is important to drink atleast six to eight glasses of water a day (Dutta et al., 1983; Shankar, 1987 and Street, 1990).

Adequate dietary fibre also is needed by older people to prevent constipation and diverticular disease (Seheider, 1982).

Daily allowance of food and nutrient intakes recommended for sedentary Indian elderly subjects (above 60 years) by Thimmayamma (1993) are given in Table I and II.

TABLE - I
FOOD REQUIREMENTS DURING OLD AGE

| Foods (gms) | Male | Female |
|------------------------|------|--------|
| Cereals | 325 | 270 |
| Pulses | 40 | 40 |
| Green leafy vegetables | 100 | 100 |
| Other vegetables | 50 | 50 |
| Fruits | 30 | 30 |
| Flesh foods | 30 | 30 |
| Fats and oils | 20 | 20 |
| Sugar and Jaggery | 20 | 20 |

TABLE - II
NUTRIENT REQUIREMENTS DURING OLD AGE

| Nutrients | Male | Female |
|-----------------|------|--------|
| Energy (Kcals) | 1973 | 1704 |
| Protein (g) | 55 | 45 |
| Calcium (mg) | 880 | 865 |
| Iron (mg) | 42 | 38 |
| Carotene (µg) | 998 | 996 |
| Thiamine (mg) | 1.2 | 1.2 |
| Riboflavin (mg) | 1.1 | 1.1 |
| Vitamin C (mg) | 40 | 40 |

2. Nutrient Intake of The Aged People

Natarajan (1987) and Street (1990) state that older persons tend to take insufficient interest in the food leading to multiple deficiencies. Energy intake and expenditure in elderly people are usually assumed to be much lower than in the young or middle aged. They are very much influenced by age, sex, health and body composition (Durnin, 1985 and Arora and Rudman, 1988). In one of the studies on the elderly in three age groups namely 55-64, 65-74 and 75 years and over, it was found that there was a progressive fall in intake with age especially after the age of 75 (US Department of Agriculture, 1972).

Dietary studies conducted in the United States indicate that in low-income areas, the diets of the elderly are far below the acceptable levels in iron, vitamin A, vitamin C and riboflavin intake (Franceschi, 1982). Similar findings were reported by Mehtra (1985) and Horwitz (1986).

Natarajan et al. (1987) studied the intake of 100 elderly people at Madras and found that the average calorie intake was 1256 and 86 per cent of them were on low protein intake. The calcium, iron, vitamin A and thiamine intake were less in 68, 58, 85, and 94 per cent of subjects respectively. Forty per cent of the subjects had low vitamin B1, B2 and Niacin intake.

Andres and Hall Frisch, (1989) found that the vegetarian elderly women had significantly greater intakes of carbohydrates, dietary fibre and several vitamins and minerals and lower intakes of saturated fatty acids, dietary cholesterol and caffeine than the non-vegetarians. Caloric intake of non-vegetarians exceeded that of the vegetarians by hardly 100 to 200 calories as they took meat, fish etc., only once or twice a week.

According to Gambert (1983), 67 per cent of the elderly appeared to have diets which met the vitamin A requirement. Over 75 years, especially women, had lower intake of

vitamin A. Studies conducted by Fletcher (1991) showed that those with higher blood and dietary levels of vitamins E, C and B and carotene had the lowest incidence of cataract. Amarjit (1988) states that the elderly people who do not eat green leafy vegetables and take laxatives too often may suffer from the deficiency of vitamin K.

According to Garry et al. (1982) over 30 per cent of the healthy free living, middle income elderly have vitamin B6 intake less than 3/4th of the recommended allowance. Vitamin B12 deficiency in the elderly is commonly occurring in three to ten per cent of patients, over the age of 65 and is associated with functional loss and neuro psychiatric sequelae (Carethers, 1988).

Poor calcium intake has been identified in a significantly greater percentage of patients with osteoporosis than in general population (Lane et al., 1984). Mc Candy (1985) states that upto 60 per cent of the males and 60 per cent of the females have a low intake of calcium and calcium absorption is decreased with age. According to Avioli (1984), on calcium intakes of 450 to 500 mg/day, normal, premenopausal and post-menopausal women develop a negative calcium balance.

Dudek (1987) states that the elderly population may be at risk of developing iron deficiency anaemia due to

decrease in meat intake, reliance on tea, decreased secretion of gastric hydrochloric acid and chronic blood loss. Gambert (1983) expresses that 30 to 50 per cent of elderly men and 70 to 100 per cent of elderly women have less than 10 mg of iron intake.

In the opinion of Linderman (1986) elderly people are more susceptible to the development of hyponatremia. It is due to decrease in the ability of the kidney to conserve sodium and reduced intake (Kohrs and Zjaka Narins, 1986).

According to Bhanu et al. (1986) and Johnston (1992) zinc levels in blood are lower in the elderly leading to delayed healing of wounds, reduced immunity and loss of taste acuity. Sandstead et al. (1982) state that daily intake of zinc in the elderly may be as low as 7 to 8 mg.

According to Prasad (1985) and Johnston (1992) blood glucose levels are often increased in older persons and an increase in the chromium intake may help to lower the blood glucose.

B. NUTRITIONAL AND HEALTH PROBLEMS OF THE AGED

1. Nutritional Problems

Malnutrition among the aged is caused by a number of factors namely poverty, ignorance, superstition, social customs, traditional prejudices, frequent infections, fixed

income, social, environmental, physical and mental disorders (Devadas and Jeya, 1984; Mouna, 1987; Natarajan, 1987 and Lehmann, 1989). Some of the common nutritional problems of the aged are discussed below:

a. Obesity

The ten state nutrition survey in India (CDC, 1968-70) showed that about 50 per cent of females and 18 per cent of males over 60 years are obese. For the over 80 years group about 25 per cent of females and 15 per cent of males are obese.

b. Anaemia

Anaemia is common in lower socio-economic groups and it is one of the most clinical problems seen in geriatric population of over 59 years (Khors and Ziaka-narins, 1986). It is present in as many as 7.5 per cent of men and 20 per cent of women. Iron deficiency is responsible for upto 45 per cent of anaemias in the elderly and 10 per cent being caused by the deficiency of vitamin B12 (Fletcher et al., 1989).

Important manifestations of anaemia in the old age are palpitation, breathlessness, postural hypotension, giddiness and the onset of congestive cardiac failure (Hodkinson, 1981). Iron deficiency can be caused by low dietary intake,

impaired absorption resulting from lack of iron, vitamin C or blood loss (Guthrie, 1986).

Anaemia is taken to be haemoglobin concentration of less than 12 g/100 ml in old age. The prevalence of pernicious anaemia increases with age and is common in female than males after the age of 60 years (Bradt, 1984). On clinical examination by Natarajan et al. (1987), 34 per cent of subjects were found to be anaemic, peripheral neuropathy was present in 14 per cent and low haemoglobin level (less than 65 %) was noted in 47 per cent of the elderly.

c. Osteoporosis

Osteoporosis is one of the most common and most serious nutrition related health problems affecting the elderly (Bidlack et al., 1986). Around 25 per cent of women over the age of 65 are said to have osteoporosis but only five per cent of men are obese (Coni et al., 1980). Nordin (1985) states that the entire female population is osteoporotic by the age of 80. Bone density diminishes more slowly with increasing age (Nikajima, 1991).

Diets of the elderly who do not drink milk may favour the development of osteoporosis. Smoking and alcohol use may play a role in the initiation of debilitating osteoporosis (Lane et al., 1984).

According to Quesada (1987), James et al. (1988) and Nagant and Devoselacr (1988) the decline of bone mineral content increases the risk of fractures in the elderly. In all countries vitamin D deficiency is more severe among elderly people with limited mobility due to chronic Institutionalisation or hospitalization after the winter months. Kaur and Mann (1990) state that lack of calcium is another major nutritional factor in senile osteoporosis.

d. Atherosclerosis and Hypertension

Natarajan (1990) and Diehl and Ludington (1991) point out that cardio vascular diseases and arthritis have become the major cause of death and morbidity in the elderly. In India around 6.5 per cent of population of 60 years age is suffering from hypertension (Mansharamani and Gupta, 1988).

According to Coni et al. (1980) complicated stroke is one of the commonest problems in geriatric practice. In these patients neurological damage reaches its peak within six hours and results in prolonged disability. According to Broadhurst (1990) angina occurring as back shoulder or epigastric pain may be misdiagnosed as related to other disorders and this silent myocardial infarction in males increases with age.

Lernfelt et al. (1990) in their study in a population of 70 years old people in Sweden, found out that the prevalence of coronary heart disease was about 30 per cent in both sexes. Myocardial infarction appeared twice as often in men as in women at age 70 but angina pectoris and ECG showed no sex difference. Myocardial infarction and probable ischaemia on ECG increased significantly between aged 70 and 79 in both sexes.

Autopsy studies have suggested that 60 per cent of the population over the age of 70 have significant coronary artery disease (Elveback and Lie, 1984). Hypertension leads to symptomatic atherosclerosis and cigarette smoking, stress and physical activity superimpose the disease. Natarajan et al. (1989) report that the mean serum cholesterol level decreases with increase in age in both sexes but the decline is significant in females at one per cent level.

According to Strasser (1983) and Sirsikar (1989), cardio vascular, cerebrovascular and malignant diseases are the leading causes of death accounting for 75 per cent of all mortality in the elderly.

Hyperlipidemia, hypertension and diabetes are closely related to atherosclerosis (Maggi et al., 1990). Balakrishna et al. (1980) conducted a study on cardiovascular disorders

in 100 persons aged 70 years and above and have revealed that half of the elderly people (57%) have symptoms specifically related to cardiovascular system. Hypertension (40%), ischemic heart disease (38%) and cardiac failure (27%) were the major disorders in the elderly. Wilber (1982) suggest that mild hypertension can be controlled by decreasing the salt intake and augment the intake of calcium or potassium ions or increasing the zinc or cadmium ratio.

e. Diabetes mellitus

Keen and Fuller (1980) express that the most obvious hormonal effect of ageing is an increased prevalence of diabetes. Bennett (1984) and Maggi et al. (1990) state that the prevalence of diabetes is 10 per cent among people aged over 60 years and between 16 to 20 per cent among those 80 years and older. About 75 per cent of diabetics are over 50 years of age (Natarajan et al., 1986; WHO, 1989 and Natarajan 1990). Davidson (1979) had proposed poor diet, physical inactivity, decreased lean body mass, decreased insulin secretion and insulin resistance to be the main causes for impairment in glucose tolerance.

Seltzer (1983) showed that 70 per cent of active elderly subjects and 53 per cent of inactive subjects had normal glucose tolerance. Glucose disposal in geriatric

subjects may be impaired by as much as 30 per cent when compared to younger controls (Drfronzo, 1979). According to Tattersall (1984), longevity may not be influenced by diabetes in the elderly.

There is evidence to suggest that, with ageing there is increased resistance to the action of insulin at the cellular level (Horwitz, 1986). Jackson et al. (1981) have demonstrated decreased peripheral glucose uptake in men aged 70 to 83 years compared to those of 30 to 45 years.

According to Natarajan and Balakrishnan (1979), 50 per cent of the patients with diabetes are first diagnosed over the age of 50 years. Davidson (1984) states that the hazards of hypoglycemia in the elderly are most serious than in the young and opportunities for delaying complications of diabetes are limited by advancing age.

2. Other Disorders Among The Aged

Disorders and malignancies of gastro intestinal system are responsible for significant morbidity and mortality in the elderly population. According to Sklar (1983) some of the more common organic diseases found in the elderly gastro intestinal patients include peptic ulcer, neoplasma, inflammatory bowel disease, diverticular disease, cancer, hiatal hernia, diverticulosis of the colon, gallstones and

ischemic diseases. Gastrointestinal disease was found to be responsible for 27 per cent of acute medical admissions in patients over 65 yrs (Vierling and Reichen, 1982) and 50 per cent of geriatric deaths are associated with gastrointestinal illness.

Constipation due to poorly mastigated food and reduced muscle force is the most common disorder of gastrointestinal tract in the aged. Pennington (1985), Natarajan et al. (1990) and Johnston (1992) put forth the causes of constipation as transit atonic colon immobility, diets with low fibre content, hypothyroidism, starvation, laxative abuse, radiation, damage to the intestinal wall and chronic intestinal obstruction. Straining at stool can be potentially serious and may result in decreased coronary and cerebral arterial flow.

The incidence of gastric ulcer increases between 40 and 65 years (Grossman, 1981). The ratio of duodenal ulcer to gastr^culcer in the old is 2:1. The average mortality for complicated peptic ulcer in the elderly population is around 30 per cent (Effenberger et al., 1986).

In the elderly bleeding is the most common complication of gastric ulcers. The second most common complication is gastric outlet obstruction in 10 to 15 per cent of patients. Nearly 50 per cent of the elderly have serious course of the

disease and account for about 80 per cent of all ulcer deaths (Narayanan and Steinberher, 1976). Winower (1982) and Lamy (1989) report that malignant neoplasms and cancer rank as the second leading cause of death for those of 65 years of age and older.

Pain, stiffness or loss of movement starts between the age of 25 and 50 years. Rheumatoid arthritis and osteoarthritis have a tremendous impact on the disability status of the elderly population (Yelin, 1989). Rheumatoid arthritis is more in females and may result in considerable crippling (Ketharpal, 1988). Gilbert and Warfield (1987) have shown that disk degeneration and cervical spondulosis are common causes of neck pain in the elderly.

Vascular diseases of the brain and nervous system represent the third leading cause of death in the United States and a majorcrippler of middle aged and old people. Decline in hand function occur with increasing age (Baron, 1989 and Weinstock, 1989).

Muscular skeletal disorders are the greatest cause of disability in the elderly. Coicon et al. (1988) state that half of all persons over age of 60 complain memory dysfunction with dementia. Hyath et al. (1990) studied the muscle strength in a sample of 92 elderly subjects.

Anthropometric measurements and hand grip strength were measured in 39 young controls. Muscle area, muscle mass and strength were significantly greater in younger controls. Elderly men had significantly greater muscle area, mass and strength than elderly women.

The commonest manifestation of hypopituitarism in the elderly is a decrease of basal metabolism, with or without frank myxoedema (Shephard, 1986).

According to Kansal (1988) and Ramani et al. (1988) troublesome problem among the aged is loss of bladder control. Urine escapes involuntarily and the bladder feels full, not relieved by urination. Rodgers et al. (1990) recommended early referral of elderly patients with acute renal failure to a specialist unit, and a substantial proportion of survivors will regain normal renal function and quantity of life. A study of Ramani et al. (1988) revealed that 29 per cent of elderly had urinary infection which was found to be three times more frequent in males (73%) than in females (27%).

A micro study conducted by Kabir (1992) on the effect of social change on the health of the elderly revealed that more than half (57.2%) of the respondents were suffering from various diseases and 41.3 per cent had no complaints. The most common ailments were heart disease/blood

pressure/paralysis (23%), fever, cough and cold (11.5%) and gastric ulcers (10.1%). Attack rates for tuberculosis are several fold higher in old age than among the young (Chandra, 1990 and Gates, 1993).

Studies from Minnesota by Annegieras et al. (1980) showed a progressive increase in incidence of intracorneal tumour. Around 0.4 per cent of 1009 elderly patients who had stroke were subsequently found at autopsy to have a tumour (Godfrey, 1984).

A study conducted by Kabil and Sood (1989) at a rural health centre in Haryana among the aged revealed that chronic bronchitis (14.55%), followed by skin diseases (13.47%), arthritis (12.39%), accidental injuries (12.68%), acute respiratory infections (7.54%) and fever (6.19%), constituting about 70 per cent of total morbidity. The other conditions were diarrhoea (3.23%), hearing defects (3.23%), pulmonary tuberculosis (2.69%), cataract (2.15%), eye infection (2.15%) and constipation (1.88%). The maximum episodes of morbidity were found in winter seasons (36.92%) followed by summer (33.15%) and rainy season (29.19%).

Studies carried out in Chandigarh and the surrounding villages by Siriphanich (1986) and Nair (1989) in Karnataka have revealed the most frequently mentioned health problems

of the aged to be defective eye sight, general weakness, pain in joints, chronic cough and cold, defective hearing, high blood pressure, digestive complaints, breathing troubles, trembling of limbs and amoebiasis.

According to Garg et al. (1982) at Meerut males constituted 55.9 per cent of the aged population and 72.9 per cent were ill at the time of survey. Higher morbidity was noticed in those who had lost their spouse. The prevalence in general was found to be 2.5 illnesses per aged person (Urmil and Sirsikar, 1989).

C. FACTORS AFFECTING THE FOOD AND NUTRIENT CONSUMPTION OF THE AGED

In old age consumption of suitable diet is the greatest single factor in preventing senility, increasing life span and vigorous activity (Kumar, 1985). Scheider (1982) and Pasricha (1990) state that a variety of physiological, psychological, environmental and social factors may restrict food choices which interfere with the body's ability to utilise food.

1. Economic Factors

Economic pressure plays an important role in determining dietary adequacy (Scheider, 1982 and Guthrie, 1986) and insufficient income is probably the chief factor that limits dietary adequacy.

According to Exton-smith (1978) old people over 80's who are able to supplement their income from their savings have a better diet than those whose sole financial means is the old age pension. Park and Park (1986) report that reduced income leads to fall in the living style of the elderly.

2. Physiological Factors

Dutta et al. and Dudek (1987) report that tremors, slowed reaction time restricting the choice of foods. Missing teeth, faulty dentures, slow digestion and diminished taste contribute to change in the choice of foods in old age. Diarrhoea, dysenteries and inefficient intestinal absorption, reduce the actual nutrient supply to the tissues (Chandra, 1985).

According to Sankar (1987), Roy (1992) and Johnston (1992), the sense of taste and smell decreases with ageing and mental depression, insufficient exercise and poor acid secretion may cause poor appetite. This is due to atrophy and loss of taste buds in the tongue. Taste thresholds are higher among institutionalised than in healthy elderly men (Spitzer, 1988). The secondary causes impaired appetite is after associated with reduction in taste and smell which occur upto 50 per cent of healthy old people (Lehmann, 1989). With advancing age, there is an increasing use of

drugs for the treatment of chronic and acute diseases and they lead to inadequate intake of nutrients or loss of nutrients (Roe, 1984).

Gambert (1983) and Johnston (1992) report that two thirds of all Americans aged 75 years have lost more than half of their teeth. Nutritious, yet hard-to-chew foods are often replaced by soft refined foods resulting in lower fibre intake and gastrointestinal problems. The use of dentures is associated with lower intake of protein, calories, vitamin B6, zinc and folate (Sahyoun et al., 1988). Aged people with heavy responsibilities and considerable tension which culminate in physical problems such as ulcer necessitate dietary changes (John, 1977).

3. Psychological Factors

After retirement some elderly persons lose their sense of worth since, they are no longer consulted for advice or see their loved ones, live far away from their children or neglected by their relatives. They often have little desire to prepare meals and may eat only those foods that are conveniently available (Robinson and Lawler, 1982 and Guthrie, 1986). Roe (1983) states that psychological factors such as pressures of every day living, wants and needs seriously influence dietary intake of the aged leading to loss of weight.

Conditions of emotional stress or deprivation, hallucinations, extreme moodswings, and paranoid reactions often lead to attitude modification towards food habits as well as changes in utilisation of nutrients. People who are anxious may experience loss of appetite and result in undernutrition or may indulge in compulsive nibbling which leads to over nutrition (Hurlock, 1985 and Massino, 1988). According to Crapo (1982) over eating may be restored to as a means of dulling the senses and dealing with the psychic stresses.

4. Social Factors

Social factors can alter life style and ultimately dietary habits. According to Kabir (1992) the most crucial factors influencing the condition of elderly are culture, tradition and values. There are a host of erroneous beliefs and superstitions, particularly among the elderly with regard to miraculous properties of certain expensive food supplements in curing all kinds of diseases (Lowen Stein, 1986).

According to Robinson and Lawler (1982) milk is taken poorly by many elderly because of the erroneous ideas concerning its value for adults. It is considered to have constipating or gas producing effect. Fruits are often

thought to be "too acidic". Many older people are under the notion that their food needs are too small.

D. PROBLEMS OF THE AGED

In developed countries the problems of the aged are mainly psychological in nature. In developing countries like India the basic needs like food, clothing, shelter and health care are the major problems of the aged (Ramachandran and Ramamurthy, 1981; Park and Park, 1983; Abraham, 1989 and Natesan, 1991). Though the rush of industrialisation has weakened the family ties, still by the large, the old people are being taken care of by the family in India (Sarkar, 1989).

1. Physical Problems

As age advances the function of the body gets affected. Loss of eye sight loss of hearing capacities and loss of motor co-ordination are common to process of ageing. Physical diseases such as failing heart, chronic chest diseases, enlarged prostate, cancer, asthma, hypertension and anaemia are common. The most common are digestive disturbances of all kinds and circulatory, metabolic and mental disorders (Mosoro, 1990). Accidents and crippling diseases like stroke and paralysis make old people completely dependent on other family members (Kerigan, 1982; Apte, 1982; Banerji, 1982 and Ghosal, 1983).

Alcohol and drug induced seizures are common causes of epilepsy in the elderly. In old age, kidneys are said to lose upto 50 per cent of their efficiency. Lungs also lose on the average of 30 to 50 per cent of their maximum breathing capacity between ages 30 and 80 years. Blood vessels lose their elasticity and bone mass drops and aged women develop osteoporosis and fractures (Sing, 1991). Fletcher, (1991) states that those with higher blood and dietary level of vitamins E, C, D and carotene have the lowest incidence of cataract.

2. Economic Problems

Economic problems are mostly seen after the person retires because his retirement income may be low and the economic burden is felt more keenly in the urban than the rural areas (Desai, 1982). Research studies in Madras, Delhi and Lucknow reveal that majority of the elderly without any income are 52, 49 and 52 per cent respectively (Gupta, 1982).

The income received by the aged at the time of their retirement is exhausted within two or three years on daughter's marriage, son's education or acquiring some property. Also, retirement pension given to the old in India is meagre (Nair, 1987). Desai (1982) reveals that nearly

one-tenth of retired persons are in serious financial difficulties in Bombay.

Sooden and Souza (1982) state that about 70 per cent of pensioners in Uttar Pradesh have a monthly income Rs. 40/-, 54 per cent have no property and 73.6 per cent of the old age pensioners need additional money to maintain themselves. Naik and Desai (1982) reveal that 20 per cent of the aged prefer to live independently. Lonely pensioners are willing to stay together in a co-operative basis (Times of India, 1981).

Bose (1983) reveals that 44.58 per cent of elderly are totally dependent on others for their livelihood, 43.2 per cent and 41.7 per cent of the elderly are completely dependent on others in Rajasthan and Delhi respectively.

Nair (1989) reveals that in the rural areas of Karnataka a sizable proportion of the elderly do not have any independent source of income. The case of female is extremely worse and the elderly females are widows.

3. Psychological and Mental Problems

Some people become old gradually, for some it is sudden in the sense that they were not prepared psychologically for that. Loss of occupation creates psychological vacuum in the life of some people (Devadas and Jaya, 1984; Gopal Nac, 1987

and Ramani, 1989). Women have comparatively less problems in old age as they are originally confined to home. If both the spouses are living, they play supportive role for each other, but if one spouse is dead, the remaining person feels very lonely and desperate (Kumaraswami, 1984; Sahni, 1987 and Sankar, 1989).

A study conducted by Sharma and Usha (1975) shows that although 60 per cent of the public assumes that the elderly frequently feel lonely, only 12 per cent of older people view loneliness as a serious problem for them.

Psychological problems such as impaired memory, rigidity of outlook, adjustment due to cessation of reproduction by women and diminution of sexual activity on the part of men are present in old age. During this period irritability, jealousy and dependency are very frequently present (Chordia, 1982; Park and Park, 1983 and Samuel, 1985).

Epidemiological studies have estimated the prevalence of mental morbidity among the aged at 89/1000 indicating a figure of million aged persons in India to be severely mentally ill. Depression is the most frequent with the prevalence rate of 43/1000 and dementia formed 20 per cent of the total mental morbidity among the aged (Sayeekumar and Gopalakrishnan, 1992).

4. Social Problems

Elderly do not explore the range of interest which will sustain them throughout life. Some even refuse the opportunity to participate in social activities (Sarkar, 1989; Chopra, 1989 and Mansharamani, 1989). Gaya (1989) states that as a result of urbanisation, industrialisation and westernization the system of joint family is breaking down and posing many difficulties in taking care of the old people. Goyal (1992) has found that those who are living in joint families are better adjusted than men living in nuclear families and men who had lost their spouse.

One of the major problems the old people face is how to occupy their leisure time (Waston, 1978). At the same time with advancing age participation in social activities declines and its scope narrows because old people are less interested in having social contacts. However if the elderly is living in an institution there are greater opportunities for recreation with the older people.

5. Family and Personal Problems

Since the family has been the root of all traditions, support for the old should begin with an examination of the changes in structure and function that the family has undergone (Venkatesamurthy, 1980).

Often the aged develop their own personal problems in their relationship with sons, daughters, daughters-in-law and grand children (Murthy and Nayak, 1987). The family problems are more in cities which are congested and where the income is insufficient to accommodate the old parents. The non-availability of adequate living space in the house is a complementary cause (Sharma, 1980 and Rao, 1982). Instability during old age leads to problem in adjustments which in turn leads to emotional tension (Sharma, 1979). They tend to withdraw from society and society tends to withdraw from them.

In India vast proportion of the aged do not retire because, 70 per cent of the people are engaged in agriculture (Desai, 1982). Hence, for such persons the changes in their life style during old age would be gradual and not sudden. The sudden change would be experienced only by those individuals who are required to retire on reaching the age of retirement (Agarwal, 1987).

The old people who can and those who want to work should be helped to find odd jobs because employment of the older persons will not only provide necessary economic security but will also help them to keep themselves busy and alert (Comfort, 1980).

E. ASSESSMENT OF NUTRITIONAL STATUS

Nutritional status is the condition of health of the individual influenced by the utilization of the nutrients. The principal aim of nutritional assessment of a community is to map out the magnitude and geographical distribution of malnutrition as a public health problem, to disclose and analyse the ecological factors that are directly or indirectly responsible and where possible to suggest approximate corrective measures preferably capable of being applied with continuing community participation (Jelliffe, 1966).

The nutritional status of a community or group is the sum of the nutritional status of individuals who form that community or group (Park and Park, 1983).

It can be determined only by the correlation of information obtained through a careful medical and dietary history, a thorough physical examination and appropriate laboratory investigations (Robinson and Lawler, 1982).

Jelliffe (1966) and Swaminathan (1974) have listed anthropometry, biophysical and biochemical tests, diet surveys, clinical assessment and vital statistics as potent means of assessing the nutritional status of the community.

1. Anthropometric Measurements

Nutritional anthropometry is an indispensable method for evaluating the nutritional status of the populations (Frisanch, 1988). Body measurements such as height and weight and other measurements are important and inexpensive in evaluation of nutritional status of the individual (Mathews, 1985).

Anthropometric measurements, although genetically determined, are strongly influenced by nutrition. They reflect the pattern of growth and physical state of individuals deviating from the average at various ages in body size, build and nutritional status.

Height and weight are the anthropometric measurements most in use. Heights are most significant since height once gained cannot be lost. Height is relatively resistant to short episodes of malnutrition but is affected by chronic malnutrition of long duration (Waterlow, 1980). Height and weight are important as these indices are highly correlated with age and reflect body composition (Micozzi et al., 1988). Body Mass Index (BMI) is a recommended method of assessing nutritional status since it is highly correlated with fat and body weight over all ages (Binn, 1985).

2. Clinical Examination

Clinical examination is the most essential part of all nutritional surveys. Physical signs of nutrient deficiencies vary according to the nutrient which is deficient. Clinical examination serve as a very effective tool to evaluate the nutritional status (Jelliffe, 1966). The aims of the clinical assessment of nutritional status is to find whether the elderly has had symptoms or signs which explain an observed change in nutritional status. In the elderly, clinical assessment present special challenges because both symptoms and signs which may be indicative of nutritional diseases can also be due to non-nutritional causes (Roe, 1986).

3. Biochemical Assessment

Biochemical assessment may be employed to determine the level of recent intake of specific nutrients, to estimate nutrient stores in body fluids or in the tissues to obtain functional measures of nutritional adequacy and to determine nutritional risk. The need for biochemical assessment may be indicated by the discovery of health problems (Rojas, 1976 and Tansala, 1980).

Estimation of blood haemoglobin is a useful index to assess the overall nutritional status according to Park and Park (1983). Haemoglobin is widely used as an index for

assessing malnutrition since it can be easily determined on a small sample (0.02 ml) which can be obtained from the finger tip and partly because its synthesis is sensitive to a deficiency of several nutrients like protein, iron, vitamin B12 and folic acid.

The interpretation of biochemical test results is also made more difficult in the elderly by the problem of deciding whether a nutritional deficiency found is causing a particular functional deficit or vice versa (Roe, 1986).

In the elderly as in other age groups, hematological assessment can be used to screen malnutrition (Roe, 1986).

A study conducted in Coimbatore by Nirmala et al. (1986) showed that elevated serum cholesterol in old age might be related to accompanying diminution in physical activity. It also showed that there was significant increase in serum cholesterol levels both with increasing age as well as with the occurrence of cardio vascular dysfunctions.

4. Diet Survey

Dietary assessment is essential to determine the adequacy of nutrient intake, (Jelliffe, 1966).

According to Beaten and Dowdy (1982) food and nutrient intake is the independent variable and measurement of food

intake is therefore of particular importance. Swaminathan (1985) reports that diet surveys constitute an essential part of any complete study of nutritional status of individual and they can provide essential information on nutrient intake levels, sources of nutrients, food habits and attitudes.

According to Rao (1980) weighment method involves actual weighment of raw foods before and after cooking. Among the several methods of diet survey, weighment method is considered to be accurate for accessing food consumption but it is laborious.

Methodology

III. METHODOLOGY

The methodology pertaining to this investigation on "Nutritional Profile and Problems of Old Age" is discussed under the following headings :

- A. Title and statement of the problem;
- B. Locale of the study;
- C. Selection of sample;
- D. Methods and tools used for the study and
- E. Analysis and interpretation of data

A. TITLE AND STATEMENT OF THE PROBLEM

This investigation is an attempt to understand the nutritional profile and problems of the elderly with reference to their socio-economic background, nutritional knowledge, health condition, activities and social status so as to suggest practical measures for mitigating their stress and strain in both the family and the community. Nutritional profile indicates the nutritional status of the individuals. The problems envisaged are of various kinds, namely social, economic, nutritional, health, physiological, psychological and personal prevailing among the selected subjects. The term 'aged', denotes people, both male and female, above the age of 60 years (UNO, 1988; ICMR, 1991; Gore, 1992; Goyal, 1992 and Jayakumar, 1992).

B. LOCALE OF THE STUDY

Both rural and urban areas were considered for this investigation. The study was carried out in Athoor Block of Dindigul Anna District of Tamil Nadu state as no investigation along this line has been carried out in this district so far. Also the choice of the locale was on the basis of the easy accessibility and familiarity of the investigator to the area. As a first step, the list of the villages in Athoor Block was obtained from the Block Development Office and seven villages, namely Chettiapatti, Chinnalapatti, Samiyarpatti, Perumal Koilpatti, Alamarathupatti, A.Ramanathapuram and Ambathurai, situated 10 to 12 km, from Dindigul town were randomly selected for conducting this study. Figure 1 indicates the distribution of villages selected in this study.

The urban areas selected were NGO Colony, Anna Nagar, Pandian Nagar, R.M.Colony, Begampur and Bhatrakaliammal Koil Street of Dindigul township.

C. SELECTION OF THE SAMPLE

The electoral rolls were used to get the list of the aged in every locality. Out of the 884 elderly identified in the ten villages and 1085 elderly identified in 10 urban areas, 600 subjects were included (300 rural + 300 urban) based on their availability at the time of this survey as well as their willingness to participate in the study. The details of the number of subjects so selected from different areas is presented in Table III.

TABLE - III

| SELECTION OF THE SAMPLE | | | |
|----------------------------------|--------------|--------------------------|--------------|
| Rural Areas | No. Selected | Urban Areas | No. Selected |
| Ambathurai | 31 | Anna Nagar | 20 |
| Alamarathupatti | 37 | Begampur | 37 |
| Chettiapatti/ Samiyarpatti | 40 | Bhatrakaliammal koil st, | 35 |
| Chinnalappatti | 48 | Mangalapuram | 30 |
| Gandhi gram/ Teacher's colony | 38 | Nehruji Nagar | 29 |
| | | NGO Colony | 30 |
| | | Pandian Nagar | 27 |
| Perumal Koil Patti | 39 | RM Colony | 36 |
| Poonchoolai | 40 | Pattai Road | 19 |
| Ramanatha Puram | 27 | RV Nagar | 37 |
| Total | 300 | | 300 |

It was found out that in the rural areas selected, 7.5 per cent of the total population constituted the aged population, while in the urban localities 8.5 per cent of the population was above 60 years of age. In the rural and urban areas 33.9 and 27.6 per cent of the available population were included in the study.

Table IV presents the distribution of subjects according to sex and the area.

TABLE - IV
SEX AND AREA WISE DISTRIBUTION OF THE SELECTED SAMPLE

| Sex | Rural | | Urban | | Total | |
|--------|-------|--------|-------|--------|-------|--------|
| | No. | % | No. | % | No. | % |
| Male | 92 | 30.70 | 118 | 39.30 | 210 | 35.00 |
| Female | 208 | 69.30 | 182 | 60.70 | 390 | 65.00 |
| Total | 300 | 100.00 | 300 | 100.00 | 600 | 100.00 |

In both the urban and rural areas, more than 60 per cent of the sample selected were females. Higher ratio of females in the population was observed in the studies conducted by Grandall (1980), Chandra (1987), Holdon (1988) and Nair (1989). The ratio of females to males in this age group is reported to be 51 : 49 (Nordia et al., 1992 and Christopher, 1992).

D. METHODS AND TOOLS USED FOR THE STUDY

The following methods were used to collect the data (Plates I to IV) :

1. Interview method
2. Anthropometric measurements-height and weight
3. Clinical examination
4. Bio-chemical and bio-physical tests and
5. Food weighment survey.

1. Interview Method

Interview is a two way method which permits an exchange of ideas and information. The information obtained by this method is accurate and effective (Gupta, 1991). Hence, interview method was used to elicit the required information from all the selected subjects.

An interview schedule was specially formulated to study the socio-economic background of the subjects and the schedule was pretested on a group of 10 aged subjects to confirm the validity and reliability of the instrument. In the light of the feedback, repetitive and less relevant questions were removed, supplementary questions were added wherever necessary and logical sequence of the questions was ensured. The schedule was thus finalised for the purpose of data collection (Appendix-I).



PLATE - 1

SUBJECTS WAITING FOR CLINICAL EXAMINATION



PLATE - 2

CLINICAL EXAMINATION IN PROGRESS



PLATE - 3



PLATE - 4

PLATES 3 & 4 BLOOD PRESSURE BEING MEASURED



PLATE - 5

DRAWING BLOOD FOR HAEMOGLOBIN ESTIMATION



PLATE - 6

FOOD WEIGHMENT SURVEY IN PROGRESS

The investigator first developed rapport with the aged respondents and the required information was then obtained from them through personal house visits. During the interview participatory observations were also made.

2. Anthropometric Measurements

Jelliffe (1966) viewed anthropometric measurements as a valuable technique in the assessment of nutritional status. Body measurements such as height and weight and other measurements are important and inexpensive in evaluation of nutritional status of the individual (Mathews, 1985). Height and weight were the indices used for health assessment.

Height and weight are highly correlated with age and reflect body composition (Micozzi et al., 1988). Height and weight measurements were recorded for the entire samples of 600 subjects. For determining body weight a portable balance was used and the recordings were made in kilograms with one decimal accuracy.

Height measurements were recorded in metric scale to the nearest 0.1 cm. Markings were made on the wall and the subjects were asked to stand barefooted with heels, buttocks, shoulders and back of the head touching the wall. Care was taken to ensure that the head of the aged person was kept erect with the arms hanging at the sides in a natural manner. A wooden scale was placed gently on the head

perpendicular to the wall and the height was recorded. Among the selected respondents for investigation none had a hunchback.

The Body Mass Index (BMI) of the respondents were calculated using the following formula :

$$\text{BMI} = \frac{\text{Weight (in kg)}}{\text{Height}^2 \text{ (in metre)}}$$

3. Clinical Examination

Clinical examination is the simplest and most practical method of ascertaining the nutritional status. Jelliffe (1966), regards clinical examination as an essential aspect of all nutritional surveys. Hence clinical examination was used to diagnose the various deficiency diseases and other disorders prevailing among the selected aged using a specially devised schedule (Appendix-II).

In the elderly, clinical assessment presents special challenges, because symptoms and signs which may be indicative of nutritional diseases can also occur due to non-nutritional causes (Roe, 1986). Out of 600 selected, 300 willing and available were considered for the clinical assessment. The clinical examination was done with the help of a practised physician.

4. Bio-chemical and Bio-physical Tests

The need for bio-chemical assessment may be indicated by the discovery of health problems (Tansala, 1980). All the 600 subjects were assessed for the presence of problems like, diabetes mellitus, anaemia and elevation of blood pressure. Urine sample was tested for the presence of sugar using Benedict's reagent (Appendix III). Finger prick blood sample was used for the estimation of haemoglobin through cyanmethaemoglobin method. Blood pressure was measured using a sphygmomanometer.

5. Food Weighment Survey

Diet survey provides information on the quantity type of foods consumed by the people and brings out dietary inadequacies as judged by available standards (Swaminathan, 1986). Food and nutrient intake is the independent variable and measurement of food intake is therefore of particular importance (Beaten and Dowdy, 1982).

Among the several methods of diet survey, food weighment method is considered to be accurate for assessing food consumption (Rao, 1980).

Food weighment method was adopted to measure the actual food consumption by the aged. Food weighment survey was carried out on 60 aged, 30 rural and 30 urban randomly

selected from the respective groups. From each of the three levels of income namely, low, middle and high, 10 subjects were selected with equal distribution among the sexes. All the subjects belonged to the age group of 60-69 years.

The investigator weighed the raw and cooked foods consumed by the families for three consecutive days. The cooked foods consumed by the selected subjects was also weighed and the values were converted into raw equivalents. The nutrients present in the diet were calculated (ICMR, 1989).

E. ANALYSIS AND INTERPRETATION OF THE DATA

The data were carefully edited and an appropriate coding plan was prepared. The relevant data were transferred to a coding sheet, fed into computer, consolidated and tabulated to furnish a comprehensive picture.

To present the data, both one-way and two-way tables with frequencies and percentages were used. Analysis of variance, 't' test, and chi-square tests were used for further analysis and statistical interpretation. The influence of independent variables, such as age, sex, educational status, occupational status and family income on the nutritional status and the social, health and the psychological problems of the aged were analysed.

Results and Discussion

IV. RESULTS AND DISCUSSION

The results of the present investigation entitled 'Nutritional Profile and Problems of Old Age' are discussed in this chapter.

This section examines information obtained on the socio-demographic characteristics, diet pattern, nutrition knowledge, nutrition, health and social problems and support available to the respondents who constituted study sample under the following headings :

- A. Socio demographic profile of the respondents;
- B. Dietary habits of the aged;
- C. Nutrition knowledge/practices of the aged;
- D. Nutritional and health problems of the aged;
- E. Nutritional status of the aged;
- F. Activities performed by the aged and
- G. Social and psychological problems of the aged.

A. SOCIO DEMOGRAPHIC PROFILE OF THE RESPONDENTS

1. Age and Sex of the Respondents

Table V furnishes the age and sex-wise distribution of the selected 600 respondents.

TABLE - V
PERCENTAGE DISTRIBUTION OF THE SAMPLE IN TERMS OF AGE AND SEX

| Age in years | Rural | | | | Urban | | | | Total | | |
|--------------|--------------|-----------------|----------------|--|---------------|-----------------|----------------|--|---------------|-----------------|----------------|
| | Male N:92 | Female N:208 | Total N:300 | | Male N:118 | Female N:182 | Total N:300 | | Male N:210 | Female N:390 | Total N:600 |
| 60-69 | 59.8 | 61.1 | 60.7 | | 58.5 | 60.4 | 59.7 | | 59.1 | 60.8 | 60.2 |
| 70-79 | 29.4 | 29.3 | 29.3 | | 28.8 | 27.5 | 28.0 | | 29.1 | 28.5 | 28.7 |
| 80-89 | 7.6 | 7.7 | 7.7 | | 12.7 | 11.0 | 11.7 | | 10.4 | 9.2 | 9.6 |
| > 90 | 3.3 | 1.9 | 2.3 | | - | 1.1 | 0.6 | | 1.4 | 1.5 | 1.5 |
| Total | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 | 100.0 | | 100.0 | 100.0 | 100.0 |

The above table indicates that the difference in the percentage distribution of the rural and urban subjects according to age and sex was very meagre.

Around 60.2 per cent of the total respondents were between 60 and 69 years, 28.7 per cent of the aged were between 70 and 79 years, 9.6 per cent of them were between 80 and 89 years and only 1.5 per cent of them were found to be more than 90 years old. The maximum percentage of the subjects were in the age group of 60 to 79 years. This is in accordance with the observation of Natarajan et al. (1987) and Goyal (1992) who state that the maximum number of elderly persons are in the age group of 60 to 69 years.

2. Marital Status

Table VI presents the marital, living and earning status of the subjects studied.

TABLE - VI

MARITAL, LIVING AND EARNING STATUS OF THE SELECTED AGED

| Characteristics | Percentage of respondents | | | | | | |
|--------------------------------------|---------------------------|------------------|------------------|---------------------|------------------------|-----------------------|-------------------------------|
| | Area | Sex | Age in years | Education | Occupation* | Income in Rs | |
| | Rural Urban | Male Female | 60-69 70-79 80 + | Illiterate Literate | NGE SE EP | <1000 1001-2000 >2000 | |
| | N=300 N=390 | N=361 N=172 N=67 | N=315 | N=285 | N=389 N=84 N=127 N=362 | N=109 N=129 | |
| 1. Marital status | | | | | | | |
| a. Spouse alive | 51.7 | 59.3 | 89.5 37.2 | 61.8 47.7 41.8 | 39.7 | 73.0 | 56.6 82.1 34.6 51.4 56.9 68.2 |
| b. Widowed | 46.3 | 39.7 | 8.6 61.5 | 36.3 51.7 56.7 | 58.4 | 26.0 | 42.7 16.7 61.4 47.0 41.3 31.0 |
| c. Single (unmarried) | 2.0 | 1.0 | 1.9 1.3 | 1.9 0.6 1.5 | 1.9 | 1.1 | 0.8 1.2 4.0 1.7 1.8 0.8 |
| 2. Living status | | | | | | | |
| a. Living with spouse | 26.0 | 35.0 | 50.5 19.7 | 33.2 27.9 22.4 | 19.4 | 42.8 | 25.7 45.2 35.4 26.5 31.2 41.1 |
| b. Living with unmarried children | 43.3 | 45.0 | 39.5 46.7 | 43.8 44.8 44.8 | 48.3 | 39.6 | 50.4 32.1 33.1 43.4 47.7 43.4 |
| c. Living with married children | 12.7 | 11.3 | 3.3 16.7 | 10.8 10.5 22.4 | 13.3 | 10.5 | 10.8 4.8 20.5 9.4 17.4 14.7 |
| d. Living alone | 18.0 | 8.0 | 6.7 16.4 | 11.9 16.3 10.4 | 18.7 | 6.7 | 12.9 17.9 10.2 20.7 1.8 0.8 |
| e. Living with relatives | - | 0.7 | - | 0.5 0.3 0.6 | - | 0.3 | 0.4 0.3 - 0.8 - 1.8 - |
| 3. Earning status of the aged | | | | | | | |
| a. Chief bread winner | 31.3 | 27.3 | 47.6 19.5 | 32.4 26.2 14.9 | 20.9 | 38.6 | 14.9 57.1 55.1 31.5 22.9 28.7 |
| b. Wholly dependent | 41.7 | 47.3 | 24.8 55.1 | 36.6 51.2 65.7 | 54.0 | 34.0 | 62.5 12.0 11.0 43.9 49.5 41.9 |
| c. Partially dependent | 27.0 | 25.3 | 27.6 25.4 | 31.0 22.7 19.4 | 25.1 | 27.4 | 22.6 31.0 33.9 24.6 27.5 29.5 |

* NGE - Not Gainfully Employed

SE - Self Employed

EP - Employed Privately

It was found out that more than half of the selected respondents in the rural as well as urban areas were in marital union at the time of survey and less than two per cent of the population were unmarried while the others had lost their spouse and lived alone. When the sex-wise distribution was analysed, the incidence of widowhood was found to be higher among females (61.5%) than males (8.6%).

According to 1981 census report, the ratio of female to males was 978 for 1000 in 60+ age group, while it was 934 for 1000 in general population in India. Large proportion of the widowed status of women in 60+ age group probably explains this trend in the sex ratio. More than 60 per cent females in 60+ age group were widows, whereas among the males this proportion was 25 per cent (1981 census) to some extent. This observation is in agreement with the findings of Desai (1988) and Gove (1992) that developing countries like India have more incidence of widowhood among females (61.54%) than males (8.57%). This difference could be attributed to the custom of women marrying men older than themselves.

The widowhood number increased gradually as the age increased. The percentage of widows/widowers was 36.3 in the age group 60-69 years and the percentage was found to be 56.7 among the 80+ age group. Also it was found out that the

number of respondents living with the spouse was more among the literate group than the illiterate group. This might be due to the obvious reason that the literate subjects took better care of their health and more over the literate were residing in the urban area and made use of the health care facilities to live longer.

When the marital status of the aged was viewed in terms of their occupation more number of subjects who were employed privately were found to be widows/widowers and this group mainly consisted of labourers who worked hard. The group which was self employed was economically comfortable and the least number of widows/widowers were found in this group.

Family income also revealed a consistent pattern of distribution of the subjects. As the level of family income increased the number of widows/widowers decreased showing a relationship between the income and the life span.

3. Living Status

The living status of the members did not differ very much between the rural and the urban areas (Table VI). Around 45 per cent of the subjects were living with unmarried children and 12 per cent of the subjects were living with married children in both the areas. While 26 per cent of them were living with their spouse and 18 per cent

of them were living alone in the rural areas, 35 per cent of them were living with spouse and 8 per cent were living alone in the urban areas.

When a sex-wise analysis was made, it was found out that more male members (50.5%) were living with their spouse when compared with the female members (19.7%). Only 6.7 per cent of the male subjects were living alone, when compared with 16.4 per cent of the female members who lived alone. According to ICMR (1991), with socio-cultural and economic transformation the monolithic joint family has gradually fissured in India. The roles and status of the seniors in the family consequently became devalued and 12 per cent and 25 per cent of the aged males and females are living alone.

In general, subjects living with unmarried children were found to be more when compared with the subjects living with the married children. This pattern indicated the trend that the married members were more independent and lived separately, away from the parents. It was also found out that as the age increased the percentage of the subjects living with their spouse decreased and living with children increased, especially with married children. It might be due to the reason that in old age due to the deteriorating health they lack confidence and prefer to live with the children.

Among the aged who were literates, the percentage of them living with children was found to be reduced and more of them were living with their spouse. Similarly the self employed who were economically more comfortable were living with their spouse and less number of this group were living with their children. Similar finding was noted in the income wise distribution also.

4. Earning Status of the Aged

Of the rural population studied, 31.3 per cent and among the urban population 27.3 per cent were found to be the chief bread winners of the family (Table VI). Around 41.7 per cent of the rural and 47.3 per cent of the urban were wholly dependent on others while the rest of them were found to be partially dependent. This finding is in accordance with the study of Bose et al. (1983) wherein it was revealed that 44.8 per cent of the elderly were dependent on others for their livelihood.

Research studies in Madras, Delhi and Lucknow revealed that the percentage of elderly without any income was 52, 49 and 52 respectively (Gupta, 1982). This finding is also in line with the present study.

The fact is that in the rural areas, most of the people are self employed or working in the unorganised sector such

as agriculture based occupations, where age is not treated as bar on employability of a person and hence there is no retirement. The economic burden is felt more strongly in the urban than in the rural areas, where majority of the old are independent agriculturists (Desai, 1982). Ramana (1993) states that most of the aged in rural areas continue to work in their fields and participate in allied activities. Many are self employed. There may be a progressive reduction in the hours of work, type and quantum of work done. In the urban areas, the tendency is to retire between 55 and 50 years.

When the earning status of the subjects was analysed in terms of the sex of the aged, it was found out that the maximum percentage of the males (47.6%) and a minimum percentage (19.5%) of the females played the role of the chief bread winner in their families. Because of the lesser earning capacity of the females, 55.1 per cent were found to be wholly dependent on others for their income while only 24.8 per cent of males were wholly dependent on others. As the age of the subjects increased their role as the chief bread winner gradually decreased and at the same time their dependency gradually increased. According to Ranade (1993) only 14 to 17 per cent of women aged 60 to 64 are enjoying economic independence in rural and urban areas and only 3 per cent of them are aged to 70 or above.

From the above analysis it is evident that a sizable portion of males were not economically dependent on their children. However, the position of women was miserable in this regard. Very few of the old women remained active and had some means of income. In the absence of any economic independence and lack of emotional support (a large majority of them were widows) the women were more dependent on their sons or daughters for their upkeep.

It was observed that 38.6 per cent of the literates and 20.9 per cent of illiterates were the chief bread winners in the families. The dependency was less among the literates (34%) when compared to the illiterates (54%). It goes without saying that the earning capacity is more among the literates and even in the old age when they got the income in the form of pension they could be less dependent on others for their basic needs.

When the aged were not gainfully employed they could not be the chief bread winners, however more than 50 per cent of the aged who were self employed or employed privately were supporting their families as chief bread winners.

When the earning status of the aged in terms of family income was considered, it was inferred that among the low income families maximum number of the aged were playing the

role of chief bread winner and at the same time the percentage of the aged who were partially dependent increased when the income increased.

5. Educational Level of the Selected Aged

Table VII and Figure 2 present the educational level of the selected respondents. It was found out that 64.7 per cent of the rural and 40 per cent of the urban respondents were totally illiterate and in every level of education namely primary school, middle/high school/and college/university level more number of urban population were found to be educated than the rural subjects. The trend of having more literate members among the aged in the urban when compared to rural area might be due to the reason that all the members who got retired from different levels of service finally settle down in the urban areas in their old age. When the sex-wise distribution of the educational status was considered, 70 per cent of the females and 20 per cent of the males were found to be illiterate. This finding is in line with the observations of Kinsella (1988) and Devadas (1988) who state that the elderly people are often illiterate particularly women. Both in the rural and urban areas, the aged males enjoy a better level of education when compared with aged females.

It was interesting to note that as the age of the subjects increased the prevalence of literacy was found to

TABLE - VII

EDUCATIONAL LEVEL OF THE SELECTED AGED

| 5. Educational level | Percentage of respondents | | | | | | | | | | | | |
|-----------------------|---------------------------|-------|--------------|------------|---------------|-------|------|-------|------|-------|-------|-----------|-------|
| | Area | Sex | Age in years | Occupation | Income in Rs. | | | | | | | | |
| | Rural | Urban | Male | Female | 60-69 | 70-79 | 80 + | NGE | SE | EP | <1000 | 1001-2000 | >2000 |
| | N=300 | N=300 | N=210 | N=390 | N=361 | N=172 | N=67 | N=389 | N=84 | N=127 | N=362 | N=109 | N=129 |
| a. Illiterate | 64.7 | 40.0 | 20.0 | 70.0 | 47.4 | 59.9 | 61.2 | 59.1 | 33.3 | 44.9 | 61.9 | 46.8 | 31.0 |
| b. Primary | 24.0 | 28.0 | 41.4 | 17.7 | 28.3 | 22.1 | 23.9 | 24.7 | 19.0 | 34.6 | 25.1 | 25.7 | 28.7 |
| c. Middle/High School | 10.7 | 27.7 | 34.3 | 11.0 | 22.2 | 14.5 | 15.0 | 15.4 | 43.0 | 15.0 | 12.2 | 24.8 | 34.1 |
| d. College/University | 0.7 | 4.3 | 4.3 | 1.5 | 2.2 | 3.5 | - | 0.8 | 4.8 | 5.2 | 0.8 | 2.8 | 6.2 |

* NGE - Not Gainfully Employed

SE - Self Employed

EP - Employed Privately

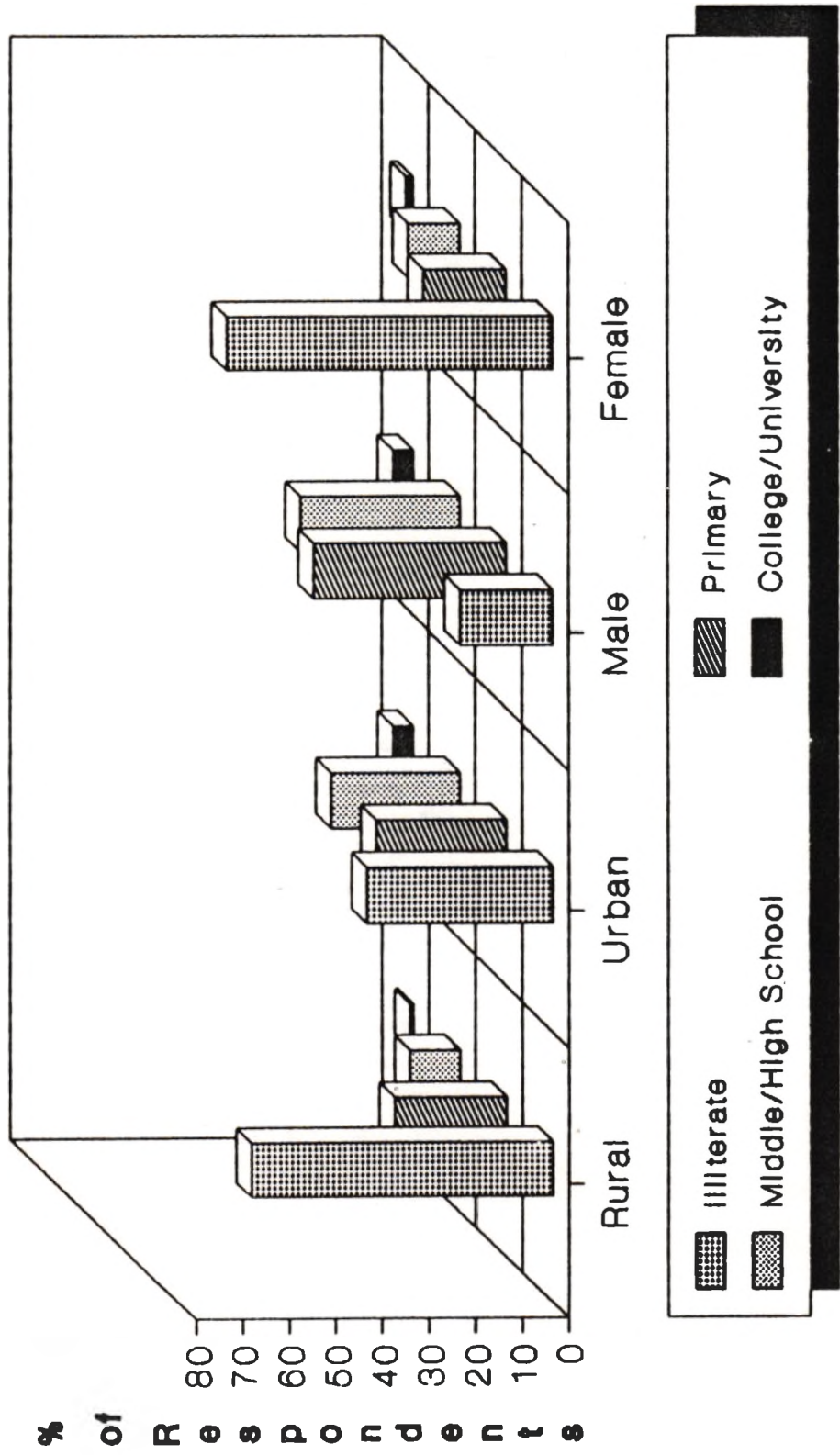


Fig. 2. EDUCATIONAL LEVEL OF THE SELECTED AGED

be more and the level of illiteracy ranged from 47.4 per cent among the 60-69 years group to 61.2 per cent among the 80+ age group. It reflects the changing trend of education at the national level indicating that more and more are being motivated to become literates in the society. Because of this reason, primary, middle and high school level of education was found to be more in the 60-69 years group when compared to the other two age groups.

When the subjects were grouped according to their occupation and their level of education was studied, it was revealing that among the self employed group the least number were illiterate and the highest percentage had education upto middle/high school level and also college/university level. Education had given them confidence to undertake self employment and run their business even in old age.

It was found that when the level of family income increased more number of the aged were found to be educated at every level. The highest percentage (61.9%) of the subjects were found to be illiterate in the group having the lowest income i.e., below Rs.1000/month.

6. Employment Pattern

Table VIII presents the employment pattern of the selected subjects studied.

TABLE - VIII
EMPLOYMENT PATTERN OF THE SELECTED SUBJECTS

| 6. Employment | Percentage of respondents | | | | | | |
|---------------------------|----------------------------|----------------------------|--------------------------------------|------------------------------------|--|------|----------------|
| | Area | Sex | Age in years | Education | Income in Rs. | | |
| | Rural Urban N=300 N=300 | Male Female N=210 N=390 | 60-69 70-79 80 + N=361 N=172 N=67 | Illiterate Literate N=315 N=285 | <1000 1001-2000 >2000 N=362 N=109 N=129 | | |
| Not Gainfully employed | 63.7 | 66.0 | 47.6 74.1 | 58.1 65.1 100.0 | 71.4 | 57.5 | 64.9 66.1 48.1 |
| Self employed | 15.0 | 13.0 | 20.0 10.8 | 15.0 17.4 - | 8.3 | 20.4 | 5.5 13.8 45.7 |
| Employed privately | 21.3 | 21.0 | 32.4 15.1 | 26.9 17.4 - | 20.3 | 22.1 | 29.6 20.2 6.2 |

The subjects were distributed into three types of work performed namely not gainfully employed and took care of the household demands, self employed which included undertaking business, professional work, skilled work etc., and the third group consisted of privately employed subjects in various concerns or worked as wage earners.

The distribution of the subjects in the three categories of employment did not show any marked difference between the rural and urban areas. The majority of them (63.7% in rural and 66.0% in urban) were not gainfully employed, 21 per cent were privately employed in both the groups and the rest were self employed.

It was found out that more of the aged females (74.1%) were not gainfully employed when compared to males (47.6%). Lesser number of females were found to be self employed (10.8%) than the males (20%). As the age advanced the number of subjects not gainfully employed gradually increased. Among the 60-69 years old subjects, 58.1 per cent were not employed and among the 80+ age group all the subjects were involved only in the household activities.

Education also seemed to have played a role in determining the employment pattern of the aged. The unemployed were found to be more among the illiterate subjects (71.4%) than among the literates (57.5%). Also

more of the literates seemed to have a confidence to be self employed (20.4%) than the illiterate (8.3%). Almost the same percentage of the subjects were privately employed among the illiterate and literate groups.

It was interesting to find out that as the level of the family income increased the percentage of the aged not gainfully employed decreased. This might be due to the reason that the aged from the higher income families had some personal income in the form of pension, interest, rent etc., and also the family members could support them better. At the same time the percentage of the subjects who were self employed increased as the family income increased. It was also found out that the percentage of the subjects employed privately decreased as the income level of the families increased.

7. Monthly Percapita Income of the Aged Respondents

Table IX and Figure 3 present the monthly percapita income of the selected respondents.

TABLE - IX
MONTHLY PER CAPITA INCOME OF THE SELECTED RESPONDENTS

| 7. Income range in Rs. | Percentage of respondents | | | | | | | | | | | |
|------------------------|---------------------------|-------------|--------------|--------------|-------------|-------------|------------|------------------|----------------|-----------|---------|----------|
| | Area | Sex | Age in years | | | Education | Occupation | | | | | |
| | Rural N=300 | Urban N=300 | Male N=210 | Female N=390 | 60-69 N=361 | 70-79 N=172 | 80 + N=67 | Illiterate N=315 | Literate N=285 | NGE N=389 | SE N=84 | EP N=127 |
| < 500 | 86.3 | 67.7 | 68.1 | 81.8 | 74.8 | 80.8 | 79.1 | 89.8 | 62.8 | 78.7 | 70.2 | 76.4 |
| 501-1000 | 11.7 | 16.7 | 19.1 | 11.5 | 15.2 | 11.0 | 16.4 | 6.7 | 22.5 | 13.1 | 17.9 | 15.0 |
| 1001-1500 | 1.3 | 5.0 | 4.8 | 2.3 | 3.3 | 3.5 | 1.5 | 1.0 | 5.6 | 2.8 | 3.6 | 4.0 |
| 1501-2000 | 0.7 | 5.0 | 4.3 | 2.0 | 4.2 | 1.2 | - | 1.0 | 5.0 | 2.3 | 1.2 | 5.5 |
| 2001-2500 | - | 1.0 | 1.0 | 0.3 | - | 1.7 | - | 0.3 | 0.7 | 0.5 | 1.2 | - |
| 2501-3000 | - | 2.7 | 1.4 | 1.3 | 1.4 | 1.2 | 1.5 | 0.6 | 2.1 | 1.5 | 2.4 | - |
| > 3000 | - | 2.0 | 1.4 | 0.8 | 1.1 | 0.6 | 1.5 | 0.6 | 1.4 | 0.5 | 3.6 | 0.8 |

* NGE - Not Gainfully Employed
SE - Self Employed
EP - Employed Privately

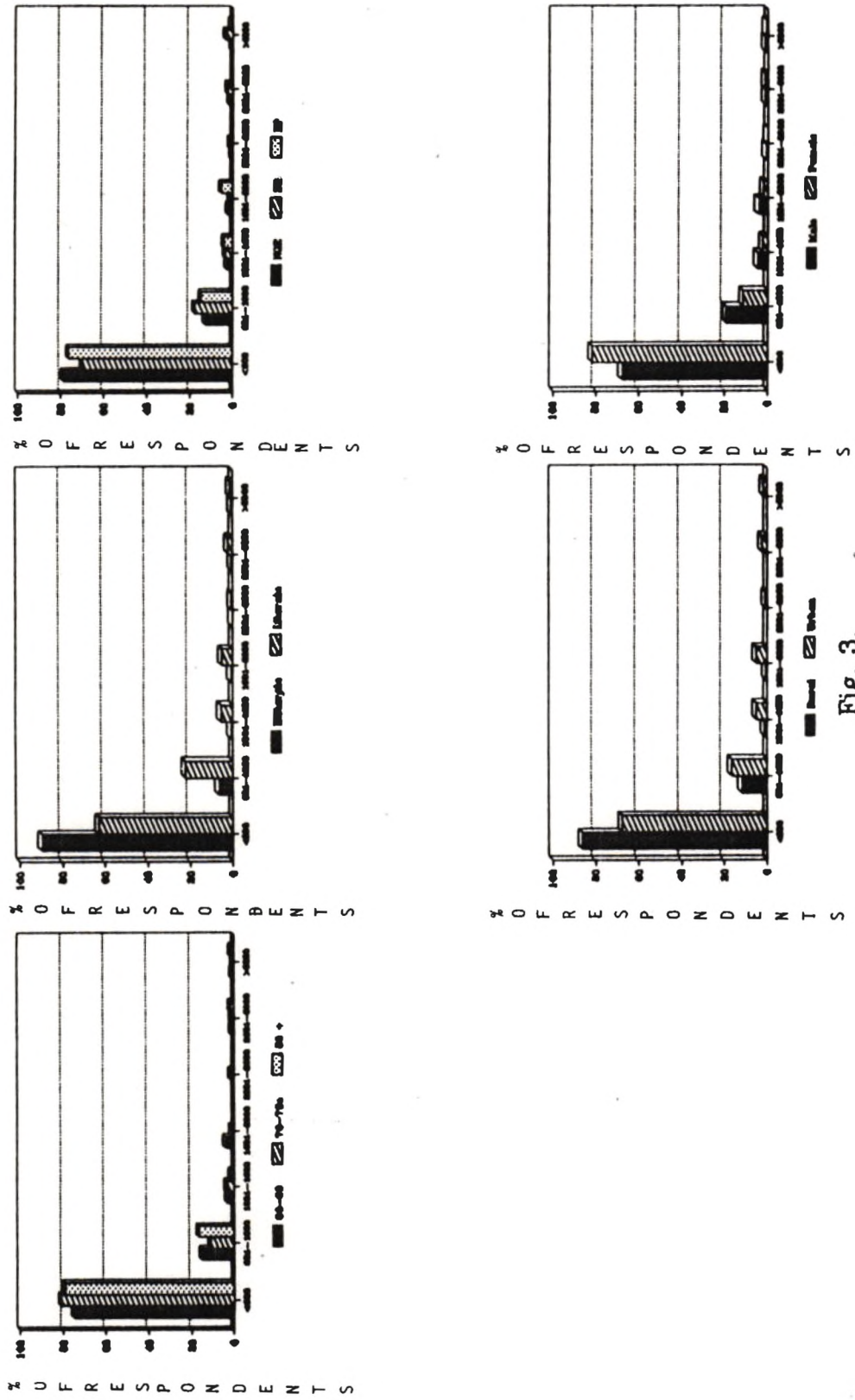


Fig. 3.
 PER CAPITA INCOME OF THE RESPONDENTS

The percapita income of the selected respondents ranged from < Rs.500 to > Rs.3000. It was found out that the majority of the subjects (86.3%) in rural and (67.7%) in urban were getting an income below Rs.500 per month. Nobody in the rural area had a per capita income above Rs.2000 per month while in the urban area 5.7 per cent of the subjects exceeded Rs.2000/- as per capita income.

Similarly more number of females (81.8%) and less number of males (68.1%) had an income level below Rs. 500 per month. In general, females had less income when compared to males.

The per capita income did not show any specific trend with the increase in age. However, the literacy status seemed to have an influence in such a way that all the literates had higher income when compared with the illiterate groups. Self employment was found to be more gainful when compared to being employed outside.

B. DIETARY HABITS OF THE AGED

1. Vegetarianism and Non-Vegetarianism

Table X presents the diet pattern followed and the number of meals consumed by the aged subjects.

TABLE - X
DIET PATTERN OF THE SELECTED RESPONDENTS

| Details | Percentage of respondents | | | | | | | | | | | | | | |
|-----------------------------------|---------------------------|-------------|------------------|---------------------|------------------------|-----------------------|------|------|------|------|------|------|------|------|------|
| | Area | Sex | Age in years | Education | Occupation | Income | | | | | | | | | |
| | Rural Urban | Male Female | 60-69 70-79 80 + | Illiterate Literate | NGE SE EP | <1000 1001-2000 >2000 | | | | | | | | | |
| | N=300 | N=210 N=390 | N=361 N=172 N=67 | N=315 N=285 | N=389 N=84 N=127 N=362 | N=109 N=129 | | | | | | | | | |
| 1. Diet Pattern | | | | | | | | | | | | | | | |
| a. Vegetarian | 9.3 | 13.7 | 9.0 | 12.8 | 11.1 | 11.6 | 13.4 | 8.6 | 14.7 | 7.7 | 31.0 | 10.2 | 8.6 | 16.5 | 15.5 |
| b. Non. Veg. | 82.0 | 86.3 | 89.5 | 81.3 | 84.2 | 83.2 | 86.6 | 89.8 | 84.9 | 88.9 | 54.8 | 89.0 | 84.8 | 82.6 | 83.7 |
| c. Ova. Veg. | 8.7 | - | 1.4 | - | 4.7 | 5.2 | 5.2 | 1.6 | 7.4 | 3.3 | 14.3 | 0.8 | 6.6 | 0.9 | 0.8 |
| 2. Number of meals per day | | | | | | | | | | | | | | | |
| a. One meal | 0.7 | 0.7 | 0.5 | 0.8 | - | 1.2 | 3.0 | 0.6 | 0.7 | 1.0 | - | - | 0.3 | 0.9 | 1.6 |
| b. Two meals | 20.0 | 3.0 | 10.0 | 12.3 | 8.9 | 18.6 | 7.5 | 15.9 | 6.7 | 12.3 | 21.4 | 2.4 | 13.8 | 14.7 | 2.3 |
| c. Three meals | 79.3 | 96.3 | 89.5 | 86.9 | 91.1 | 80.2 | 89.5 | 83.5 | 92.6 | 86.6 | 78.6 | 97.6 | 85.9 | 84.4 | 96.1 |

* NGE - Not Gainfully Employed
SE - Self Employed
EP - Employed Privately

The data indicates that the majority of the subjects in the rural and urban areas (82.0% and 86.3% respectively) were non vegetarians while 9.3 per cent of the rural and 13.7 per cent of the urban were found to be purely vegetarians. Only 8.7 per cent of the rural and none in the urban were found to be ovo - vegetarians. The number of males who were non-vegetarians were slightly greater (89.5%) than the females (81.3%). The age level, literacy level, employment and family income of the subjects did not have any influence over the diet pattern of the aged.

2. Number of Meals Consumed

When the number of meals consumed by the aged subjects was studied the least percentage of the subjects consumed only one meal a day while the majority of them consumed three meals a day.

When the subjects were distributed according to the age category it was noted that the highest percentage was consuming one meal per day among the 80+ age group. This finding supports the view that the older members consume less food because of their reduced physical activity and poor digestion capacity.

In the present investigation the percentage of the respondents taking three meals per day was more in the age

group of 60-69 years. Hence it is clear that as age advances the number of meals taken per day by the elderly decreases.

3. Taste Preference Among the Aged

Table XI presents the taste preferred and the changes introduced in the diet of the aged subjects.

TABLE - XI

TASTES PREFERENCES EXPRESSED AND THE MODIFICATIONS OF THE DIET FOLLOWED BY THE AGED

| Percentage of respondents | | | | | | | | | | | | | | | |
|---------------------------------|-------|-------|--------------|--------|-------|-----------|------------|---------------|----------|-------|-------|-------|-------|-----------|-------|
| Details | Area | Sex | Age in years | | | Education | Occupation | Income in Rs. | | | | | | | |
| | Rural | Urban | Male | Female | 60-69 | 70-79 | 80 + | Illiterate | Literate | NGE | SE | EP | <1000 | 1001-2000 | >2000 |
| | N=300 | N=390 | N=210 | N=390 | N=361 | N=172 | N=67 | N=315 | N=285 | N=389 | N=84 | N=127 | N=362 | N=109 | N=129 |
| Taste preferred | | | | | | | | | | | | | | | |
| 1. Sweet | 23.7 | 34.0 | 28.6 | 29.0 | 29.6 | 23.8 | 37.3 | 24.1 | 34.0 | 28.3 | 60.7 | 9.4 | 24.9 | 33.0 | 36.4 |
| 2. Salt | 13.7 | 6.0 | 11.0 | 9.2 | 7.5 | 12.8 | 15.0 | 12.4 | 7.0 | 10.3 | 16.7 | 4.0 | 10.8 | 9.2 | 7.8 |
| 3. Hot | 60.3 | 78.7 | 72.4 | 68.0 | 72.3 | 64.0 | 68.7 | 73.0 | 65.6 | 75.6 | 96.4 | 48.8 | 66.9 | 79.8 | 68.2 |
| 4. Spicy | 22.7 | 17.7 | 17.1 | 21.8 | 21.1 | 13.4 | 32.8 | 23.2 | 16.8 | 22.6 | 32.1 | 4.7 | 17.1 | 21.1 | 27.9 |
| 5. Bland | 16.0 | 7.3 | 14.3 | 10.3 | 13.6 | 7.6 | 12.0 | 11.1 | 12.3 | 12.9 | 19.0 | 3.1 | 13.8 | 9.2 | 7.8 |
| Changes in the diet | | | | | | | | | | | | | | | |
| 1. Reduced intake | 72.7 | 73.3 | 67.1 | 75.6 | 72.0 | 69.8 | 86.6 | 75.0 | 70.8 | 85.3 | 100.0 | 17.3 | 73.0 | 71.5 | 74.4 |
| 2. Reduced fibre Content | 8.7 | 12.3 | 8.6 | 11.5 | 8.9 | 11.0 | 17.9 | 11.1 | 9.8 | 12.3 | 10.7 | 4.7 | 7.4 | 14.6 | 15.5 |
| 3. Avoiding spices | 12.0 | 16.7 | 13.8 | 14.6 | 13.6 | 14.0 | 19.4 | 13.3 | 15.4 | 17.7 | 14.3 | 3.9 | 10.7 | 20.2 | 19.3 |
| 4. Additional of Non-veg. foods | 6.3 | 5.3 | 3.3 | 7.2 | 5.3 | 6.4 | 7.4 | 7.6 | 3.8 | 6.4 | 9.5 | 1.6 | 5.5 | 9.2 | 3.9 |
| 5. Avoiding Non-veg. items | 15.3 | 9.7 | 10.5 | 13.6 | 12.5 | 12.8 | 12.0 | 13.6 | 11.2 | 15.4 | 11.9 | 3.9 | 11.0 | 17.4 | 12.4 |
| 6. Reduced salt content | 13.3 | 18.0 | 12.9 | 17.2 | 14.4 | 15.7 | 22.4 | 12.7 | 18.9 | 19.3 | 14.7 | 2.4 | 15.7 | 14.6 | 16.3 |
| 7. Reduced sugar content | 12.7 | 17.7 | 15.7 | 14.9 | 16.0 | 12.2 | 17.9 | 12.0 | 18.5 | 17.0 | 20.2 | 6.2 | 14.1 | 13.8 | 19.3 |

* NGE - Not Gainfully Employed

SE - Self Employed

EP - Employed Privately

Maximum percentage of both the rural (60.3%) and urban (78.7%) subjects preferred hot foods first followed by sweet items. Spicy foods were preferred by 22.7 per cent of the rural and 17.7 per cent of the urban subjects respectively.

The bland and salty foods were least preferred by the subjects in this study. Preference of sweet was recorded among 28.6 per cent of males and 29.0 per cent female subjects. When the subjects were grouped according to their age it was found out that the highest percentage of subjects among the 80+ age group liked sweet items, spicy items and salty foods. The literate subjects, though preferred sweets very much than the illiterate group their intake of salty, hot and spicy foods were found to be lesser when compared against the illiterate subjects.

When the taste preferences of the aged subjects was studied in terms of their occupation, the maximum percentage of the self employed individuals preferred all the tastes followed by the not gainfully employed group. As the level of family income increased the percentage of the subjects preferring sweets as well as spicy foods increased and those preferring salt and bland foods decreased.

4. Modifications Introduced in the Diet of the Aged

The aged subjects introduced several modifications in their normally consumed diets (Table XI).

More than 70 per cent of the urban and rural subjects expressed that they had reduced the quantity of foods consumed in their old age. More number of females (75.6%) seemed to have reduced their intake, when compared to male (67.1%). Of the different age groups studied, the maximum percentage (86.6%) of the 80+ year group reduced their intake when compared to the other two groups. It was noted that almost all the subjects (100%) who were self employed reduced their food intake when compared to the members employed privately (17.3%). Income level of the families did not have any special influence on the quantity of foods consumed.

The other modifications namely, reduced fiber intake, avoiding spices in the diet, addition or avoiding non-vegetarian foods and avoiding salt or sugar were expressed by lesser percentage of the subjects. In conclusion greater percentage of the subjects in the urban areas, more number of males than females, those in 80+ age group, greater percentage of illiterates, those not gainfully employed and subjects from higher income group expressed that they consumed diets with fibre content.

Almost the above trend was observed in avoiding spices in the diets except in the case of more number of literates who avoided spices and also those belonging to the income range of Rs.1001-2000 avoided spices.

From the data it was inferred that some of the subjects added more of non-vegetarian foods in the diet while some avoided non-vegetarian foods because of ageing. Reduced intake of salt as well as sugar was followed by some of the subjects in all the groups. This was mainly towards the control of health problems as advised by the doctors.

5. Frequency of Consumption of Protective Foods

Table XIII presents the frequency of consumption of protective foods as stated by 600 aged respondents in this study.

TABLE - XII

FREQUENCY OF CONSUMPTION OF PROTECTIVE FOODS STATED BY THE
RESPONDENTS
No. Studied : 600

| Food Stuffs | Percentage of respondents | | |
|------------------------------|---------------------------|---------------------|--------------|
| | Daily | Weekly 2-3 times | Occasionally |
| 1. Pulses | 66.9 | 44.4 | 8.7 |
| 2. Green leafy vegetables | 47.3 | 45.9 | 6.5 |
| 3. Fruits | 63.1 | 20.0 | 16.9 |
| 4. Milk and milk products | 93.3 | 5.5 | 1.2 |
| 5. Non. vegetarian foods | 14.7 | 39.0 | 46.3 |

The protective foods consumed by the aged subjects included pulses, green leafy vegetables, fruits, milk and milk products and non-vegetarian foods. More than 90 per cent of the aged subjects consumed milk and milk products such as butter milk every day. Pulses by 66.9 per cent, fruits by 63.1 per cent, green leafy vegetables by 47.3 per cent and non-vegetarian foods mainly egg by 14.7 per cent were consumed every day. Less than 10 per cent of the subjects consumed pulses, milk and milk products and green leafy vegetables occasionally. Fruits were consumed by 16.9 per cent of the subjects occasionally and the maximum percentage of the aged (46.3%) consumed non-vegetarian foods occasionally. In general the consumption level of protective foods was not very discouraging though there was room for further improvement.

6. Foods Included and Avoided

Table XIII presents the list of foods included as well as avoided by the aged respondents.

TABLE - XIII

FOODS INCLUDED AND AVOIDED BY THE AGED. No. Studied : 600

| Foods included | Foods avoided |
|--|--|
| Grains: Rice, wheat, ragi bajra and pulses | Grains: Jowar, ragi and pulses |
| Vegetables and fruits: greens, other vegetables and banana | Vegetables and fruits: Greens, bitter gourd, brinjal, clusterbeans, potato and papaya |
| Flesh foods: All flesh foods | Flesh foods: Chicken, egg and dry fish |
| | Other foods: Spicy foods, fried foods, tamarind, coffee and tea |

In general the cereals, pulses, millets, vegetables, fruits and flesh foods were all included in the diet by the majority of the aged subjects. But no specific reason for including these foods could be stated by the subjects. At the same time, some of the respondents avoided jowar, ragi and grams because they were producing indigestion and gas trouble, vegetables and fruits namely green leafy vegetables, brinjal, bitter gourd, cluster beans, potato, raw plantain and papaya were avoided because they were heat producing or gas producing or allergic in reaction. Flesh food namely chicken, egg and dry fish were avoided since, they were not agreeable to their system. Spicy foods, fried foods, tamarind, coffee and tea were considered to cause indigestion by some of the subjects. Green leafy vegetables were avoided by some as they were causing diarrhoea. It was noted that ragi, pulses, green leafy vegetables, other vegetables and flesh foods were considered good for health by some of the subjects while the same foods were avoided by some of the respondents. This indicate lack of nutrition knowledge among the subjects studied.

7. Details of Fasting Observed in Old Age

Table XIV presents the details of fasting observed by the aged subjects in the study.

TABLE - XIV
DETAILS OF FASTING OBSERVED IN OLD AGE

| Number of meals missed | Rural | | Urban | |
|-----------------------------|--------------|-----------------|---------------|-----------------|
| | Male N:92 | Female N:208 | Male N:118 | Female N:182 |
| One | 5.4 | 13.7 | 13.6 | 23.1 |
| Two | 16.3 | 19.6 | - | 8.2 |
| Nil | 78.3 | 66.7 | 86.4 | 68.7 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |
| Frequency of fasting | | | | |
| Once in a week | 3.3 | 12.1 | 8.5 | 9.3 |
| Once in a month | 2.2 | 19.2 | 5.1 | 22.0 |
| Occasionally | 94.5 | 68.7 | 86.4 | 68.7 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |

It was observed that the habit of observing fasting by missing one or two regular meals of the day was prevailing both among the rural and the urban aged. More number of rural subjects missed the meals (21.7% males and 33.3% females) when compared against the urban members (13.6% male and 31.3% female). In general more of females than the males had the habit of observing fasting.

Majority of the aged missed their meals on specific days and festival days for religious reasons. More of females and less of males observed fasting on new moon days in memory of their departed spouse. Very few members were fasting once a week.

It was already discussed that many a number of aged in both the rural and urban areas had only two meals a day as a routine. Further reduction in the intake in the form of fasting was observed mainly for religious reasons and none of them fasted on health grounds.

8. Preparation and Consumption of Meals by the Aged

Table XV presents the details on the help received by the subjects towards the preparation of their meals and the satisfactions derived.

TABLE - XV
DETAILS ON THE PREPARATION AND CONSUMPTION OF MEALS BY THE
AGED

| Details | Rural (%) | Urban (%) |
|---|-----------|-----------|
| 1. Preparation of food (No. 208 females in rural and No.182 in urban) | | |
| a. Participating in food preparation | 68.3 | 76.0 |
| b. Food prepared by daughters/daughters-in-law etc. | 29.3 | 23.3 |
| c. Prepared by relatives/friends | 2.3 | 0.7 |
| Total | 99.9 | 100.0 |
| 2. Consumption of food (300 rural and No. 300 urban) | | |
| a. Taking food along with family members | 82.3 | 45.0 |
| b. Taking food alone | 17.3 | 55.0 |
| Total | 100.0 | 100.0 |
| 3. Satisfactions regarding food (No.300 rural and No.300 urban) | | |
| a. Satisfied | 77.7 | 91.0 |
| b. Not-satisfied | 22.3 | 9.0 |
| Total | 100.0 | 100.0 |

The results of the survey indicated that among the rural as well as the urban areas, only female subjects participated in the preparation of meals. Around 68.3 per cent of the rural and 76.0 per cent of the urban old women fully or partially took up the food preparation responsibility at home. Only 29.3 per cent of the rural and

23.3 per cent of the urban women stated that food was mainly prepared by the other members at home and they did not participate much in that work. The more participation of the urban women in cooking might be due to the family demands such as young women going out for work or cooking was easy in urban homes due to the use of labour saving devices. When the consumption of food was considered, 82.3 per cent of rural and 45.0 per cent of urban members consumed food along with the other family members. The remaining subjects stated that they always consumed food alone. Out of the total 600 subjects, 77.7 per cent of the rural and 91.0 per cent of the urban were not having any complaints about food while the rest were not satisfied with the food consumed because of inadequacies due to economic reasons.

C. NUTRITION KNOWLEDGE/PRACTICES OF THE AGED

1. Scores Received for Nutrition Knowledge

An effort was undertaken in this study to assess the nutrition knowledge of the aged individuals included in this study. The main aspects considered in the nutrition knowledge test were meaning of balanced diet, uses of papaya and green leafy vegetables, proper method of cooking cereals, pulses and vegetables and awareness about the need for safe drinking water. The responses given by the subjects were evaluated for a total score of 20. Table XVI and Figure 4 present the mean scores obtained by the subjects studied.

TABLE - XVI

MEAN SCORES OBTAINED FOR NUTRITION KNOWLEDGE BY THE AGED

| Aspects | Percentage of respondents | | | | | | | | | | | | | | | |
|--|---------------------------|--------|--------------|--------|-----------|------------|------|------------|----------|---------|------|-------|-------|-----------|--------|-------|
| | Area | Sex | Age in years | | Education | Occupation | | Income | | | | | | | | |
| Marks | Rural | Urban | Male | Female | 60-69 | 70-79 | 80 + | Illiterate | Literate | NGE | SE | EP | <1000 | 1001-2000 | >2000 | |
| | N=300 | N=300 | N=210 | N=390 | N=361 | N=172 | N=67 | N=315 | N=285 | N=389 | N=84 | N=127 | N=362 | N=109 | N=129 | |
| Knowledge | | | | | | | | | | | | | | | | |
| Knowledge on | | | | | | | | | | | | | | | | |
| Balanced diet Total | 5 | 3.2 | 3.4 | 3.24 | 2.74 | 3.64 | 3.81 | 2.8 | 2.64 | 4.11 | 1.63 | 3.92 | 3.46 | 1.26 | 3.44 | 3.82 |
| Uses of papaya Total | 3 | 1.14 | 1.25 | 1.25 | 1.25 | 1.34 | 1.02 | 1.23 | 1.23 | 1.4 | 1.13 | 1.6 | 1.56 | 0.32 | 1.8 | 0.2 |
| Uses of Green leafy vegetables total | 5 | 2.4 | 2.8 | 2.2 | 1.9 | 2.4 | 3.1 | 2.8 | 1.9 | 3.5 | 2.0 | 3.3 | 3.9 | 1.9 | 3.8 | 3.9 |
| Practices | | | | | | | | | | | | | | | | |
| Proper method of cooking cereals and pulses | | | | | | | | | | | | | | | | |
| Proper method of cooking vegetable | 1 | 0.2 | 0.3 | 0.3 | 0.2 | 0.3 | 0.1 | 0.1 | 0.2 | 0.4 | 0.1 | 0.6 | 0.4 | 0.03 | 0.3 | 0.8 |
| Washing vegetables before cutting | 1 | 0.42 | 0.65 | 0.57 | 0.51 | 0.44 | 0.43 | 0.52 | 0.46 | 0.61 | 0.14 | 0.21 | 0.78 | 0.50 | 1.0 | 0.64 |
| Cutting vegetables large/medium pieces | | | | | | | | | | | | | | | | |
| Cutting vegetables large/medium pieces | 2 | 0.63 | 0.66 | 0.71 | 0.61 | 0.60 | 0.55 | 0.26 | 0.60 | 0.73 | 0.21 | 0.32 | 1.88 | 0.70 | 0.95 | 0.65 |
| Boiling and filtering drinking water | | | | | | | | | | | | | | | | |
| Boiling and filtering drinking water | 2 | 0.46 | 1.13 | 0.79 | 0.52 | 0.55 | 0.38 | 0.78 | 0.39 | 0.88 | 0.17 | 1.21 | 1.14 | 0.55 | 1.33 | 0.92 |
| Total Scores | 20 | 8.60 | 10.69 | 9.36 | 8.08 | 9.67 | 9.59 | 8.74 | 7.62 | 12.13 | 5.48 | 11.41 | 13.82 | 5.41 | 13.02 | 11.68 |
| t/f value | | 1.8721 | | 1.1873 | | 1.5857 | | 1.782 | | 2.3026* | | | | | 1.3824 | |

* MGE - Not Gainfully Employed * Significant at five per cent level
 SE - Self Employed ** Significant at one per cent level
 EP - Employed Privately

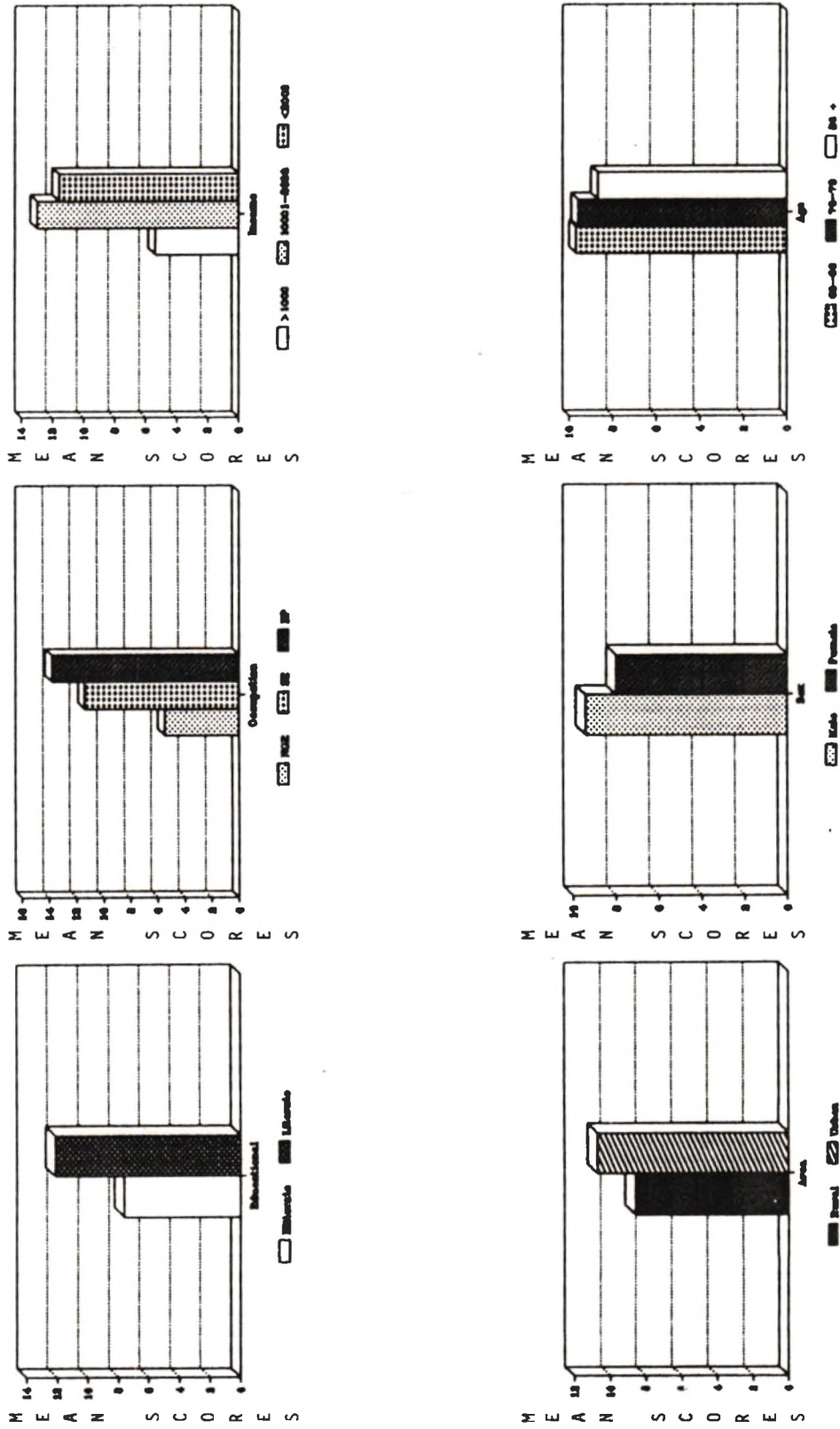


Fig. 4.
 SCORES OBTAINED FOR NUTRITION KNOWLEDGE BY THE
 AGED

The results indicated that among the rural and urban subjects more scores were obtained by the urban members (10.69) when compared to rural members (8.60). Of the different aspects tested the knowledge on proper methods of cooking were found to be weak both in the urban and rural samples studied. As a result, cooking the cereals and pulses through boiling, draining and throwing away the water were commonly followed in the families. As far as the safe drinking water was concerned the urban samples were found to be more aware of the need for boiling and filtering drinking water and they received the mean scores of 1.13 out of 2 as against the mean score of 0.46 obtained by the rural subjects. The difference in the scores obtained by the rural and urban subjects was found to be not significant ($t = 1.872$).

The mean scores received by the male subjects were 9.36 out of 20 while the female members received 8.08 scores. As seen for all other aspects studied, the male members were better off than the females in the nutrition knowledge also and the difference was not significant ($t = 1.1879$).

The knowledge scores obtained by 60-69 years old groups, 70-79 years old groups and 80+ age groups were found to be 9.67, 9.59 and 8.74 respectively. Though for all the

questions the marks obtained by the eldest group was less than the other two, this group scored the highest mark for using safe drinking water, i.e., boiling and filtering the water. This might be due to the fact that 80+ yrs. old members developed the habit of drinking boiled water for health reasons since they are more susceptible to infectious diseases. Scores obtained by the three age groups were not significantly different from each other (f value = 1.585).

Status of education also played a role in improving the nutrition knowledge and practices of the aged subjects. The mean scores obtained by the literates was 12.13 and the scores obtained by the illiterates was 7.62. For every aspect tested the literates received higher scores and this was mainly due to the habit of reading literature and gathering knowledge from different sources. The difference in the scores obtained by the two groups was not statistically significant (t value = 1.782).

Among the three level of occupation, those who remained indoors received the least scores and also the lowest income group received the least scores for knowledge on nutrition. The difference in scores obtained by the respondents having different occupations regarding nutrition knowledge was significant at five per cent level (f value = 2.30). The scores received by the subjects at

three different income levels did not show any significant difference (f value = 1.382).

2. Knowledge on Food Preservation

Table XVII presents the methods followed by the aged subjects for home scale preservation of foods.

TABLE - XVII

FOOD PRESERVATION METHODS FOLLOWED BY THE AGED

(No. Studied: 300 per group)

| Methods | Foods preserved | Rural % | Urban % |
|---------------------------------------|---------------------------------------|------------|------------|
| Sun-Drying | Cereals, pulses, vegetables | 51.3 | 47.7 |
| Storing in air tight containers | Cereals, pulses | 15.3 | 11.7 |
| Use of neem leaves | Rice | 2.7 | - |
| Preparation of jams and pickles | Lime, Mango, Gooseberry, Tomato | 33.0 | 44.0 |
| Not able to answer | | 37.7 | 25.6 |

The rural and the urban aged seemed to be familiar with the methods such as sun drying, storing the cereals and pulses in the air tight containers and preparation of pickles and jams. More of the rural subjects preserved the cereals, pulses and vegetables using the above methods than

the urban subjects. In case of jam making and pickling, 44 per cent of the urban and 33 per cent of the rural subjects were preserving lime, mango, gooseberry and tomatoes. Around 25.6 per cent of the urban, 37.7 per cent of the rural members were not able to answer this question on food preservation. It was revealed that both the urban and the rural subjects were aware of some simple techniques to preserve the foods.

Table XVIII presents the statements given by the respondents regarding the foods included and avoided during different conditions of illness.

3. Foods Included and Avoided During Illness

TABLE - XVIII
FOODS INCLUDED AND AVOIDED DURING ILLNESS

| No. Studied = 600 | | |
|--------------------------------|---|--|
| Conditions of illness/diseases | Foods included | Foods avoided |
| Cold | Hot drinks, spicy pepper water and juice. | Cold foods like curd, butter milk and lime |
| Fever | Porridge, milk, bread, rice with dhal soup and biscuits | All other foods |
| Diarrhoea | Curd rice and fenugreek seeds | Spicy and hot foods |
| Indigestion | Garlic, ginger drink, pepper-water | Oily foods and pulses |
| Peptic ulcer | Milk, banana, biscuits and curd | Spicy foods, coffee, tea and alcohol |
| Diabetes mellitus | Ragi, bajra, and bitter gourd | Sugar, rice, sweets and root vegetables |
| Jaundice | banana, butter milk, and pulses | curd and oily foods |
| Chickenpox | Porridge, tender coconut, banana, onion and curd | Salty and spicy foods and oily foods |

In general almost all the 600 respondents were found to be aware of the need for changing the diet during illness or disease conditions. During cold they were of the opinion that hot drinks and spicy pepper water could be given and at

the same time they avoided cold foods like curd, butter milk and lime juice. During fever the foods mainly given were porridge, milk, bread, rice with dhal soup and biscuits. All these foods were considered to be easily digestible for patients suffering from high temperature. To control diarrhoea, the majority of the subjects expressed that curd rice is the best and fenugreek seeds with curd should be consumed to stop loose motion. Spicy and hot foods were considered to aggravate diarrhoea. Persons suffering from indigestion were encouraged to take pepper water, garlic and ginger drink. Oily foods and pulses were avoided since, they were hard to digest and gas producing respectively. Many of the respondents were aware that milk, banana, biscuits and curd were the agreeable foods for the ulcer patients and spicy foods and coffee, tea and alcohol should be avoided in peptic ulcer. In diabetes mellitus many considered that millets and bitter gourd were good foods to bring down the blood sugar level and at the same time they avoided rice, sweets and root vegetables. The specific answers for peptic ulcer and diabetes mellitus were mainly obtained from those suffering from those conditions and they were advised by the physicians to follow the strict diet regime.

Almost all the aged individuals could answer that porridge, tender coconut, banana, onion and curd were the

ideal foods for those affected by chickenpox because these foods have cooling effect on the body. Salty and spicy foods as well as oily foods were strictly avoided during the viral diseases as these foods produce itching and aggravate the rashes.

The elder members in the families seemed to be aware of these kinds of dietary modifications both in the rural and urban areas. The daughters, daughters-in-law and all neighbourhood ladies used to take the advice of the elderly regarding the diet to be given to the suffering members in their families.

4. Sources of Nutrition Knowledge

Table XIX presents the sources through which nutrition knowledge was gained by the aged subjects.

TABLE - XIX
 SOURCES OF NUTRITIONAL KNOWLEDGE GAINED BY THE AGED SUBJECTS

| Source of nutritional knowledge | Percentage of respondents | | | | | | | | | | | | | | |
|---------------------------------|---------------------------|------------|--------------|-------------|-------------|--------------|------------------|----------------|-----------|---------|----------|-------------|-----------------|-------------|------|
| | Area | Sex | Age in years | Education | Occupation | Income in Rs | | | | | | | | | |
| | Rural N=300 | Male N=210 | Female N=390 | 60-69 N=361 | 70-79 N=172 | 80 + N=67 | Illiterate N=315 | Literate N=285 | NGE N=389 | SE N=84 | EP N=127 | <1000 N=362 | 1001-2000 N=109 | >2000 N=129 | |
| 1. Literature | 26.3 | 28.7 | 31.9 | 17.4 | 28.5 | 32.1 | 11.1 | 0 | 57.1 | 22.4 | 29.8 | 11.0 | 19.1 | 33.9 | 45.7 |
| 2. Radio | 47.0 | 78.7 | 84.3 | 51.5 | 65.0 | 41.3 | 20.0 | 45.1 | 82.8 | 54.8 | 84.5 | 74.8 | 52.2 | 59.6 | 73.6 |
| 3. Others | 67.7 | 84.7 | 48.6 | 71.0 | 77.0 | 73.7 | 20.0 | 98.1 | 52.3 | 87.1 | 90.5 | 33.1 | 82.0 | 78.0 | 58.9 |

* NGE - Not Gainfully Employed
 SE - Self Employed
 EP - Employed Privately

The main sources of nutrition knowledge for the aged individuals were reading literature, listening to radio and other sources such as advice from doctors, social workers, neighbours, friends and family members. In both the rural and urban areas the majority of the subjects received the knowledge from the members as stated above, listened to radio and read also the literature. However, when the sex wise distribution of the data was made, it was observed that the majority of the male and female subjects learned the nutritional facts mainly through radio followed by listening to others. It was found out that the least proportion of subjects in every age group was dependent on literature for gaining knowledge on nutrition. The illiterate members were mainly dependent on others to gain knowledge on nutrition and literature had no role to play in educating the illiterate respondents. Among the three types of occupation groups maximum number of self-employed subjects received nutrition knowledge through literature, radio as well as listening to others. Higher percentage of subjects who were not gainfully employed received nutrition information through reading literature, as well as listening to others compared to the group of employed individuals. It was mainly because they had no time at home to read and talk to others. As the income level of the subjects increased the percentage of aged gaining knowledge through reading literature as well

as listening to radio increased. At the same time the proportion of the subjects getting knowledge from others decreased as the family income decreased.

D. NUTRITIONAL AND HEALTH PROBLEMS OF THE AGED

For the 300 aged respondents (150 rural and 150 urban) clinical examination was carried out and the other health problems prevailing were noted down. The findings of the investigation are discussed in terms of

1. Nutritional problems
2. Physiological problems
3. General problems and
4. Prevalence of diseases

1. Nutritional Problems

Table XX and Figure 5 depict the nutritional problems of the subjects studied.

TABLE - XX
NUTRITIONAL PROBLEMS OF THE AGED

| Problems | Variables | | | | | | | | | | | | | | |
|---------------------------|-----------|---------|--------------|--------|--------|-----------|------|------------|----------|--------------|------|------|-------|-----------|-------|
| | Area | Sex | Age in years | | | Education | | Occupation | | Income in Rs | | | | | |
| | Rural | Urban | Male | Female | 60-69 | 70-79 | 80 + | Illiterate | Literate | NGE | SE | EP | <1000 | 1001-2000 | >2000 |
| | N=150 | N=150 | N=90 | N=210 | N=191 | N=81 | N=28 | N=168 | N=132 | N=223 | N=53 | N=19 | N=165 | N=60 | N=75 |
| Anaemia | 134 | 94 | 60 | 168 | 140 | 68 | 20 | 141 | 87 | 154 | 55 | 19 | 163 | 32 | 33 |
| Angular Stomatitis | 35 | 27 | 14 | 48 | 36 | 22 | 4 | 45 | 17 | 16 | 38 | 8 | 49 | 8 | 5 |
| Spongy and Bleeding gums | 22 | 49 | 16 | 55 | 45 | 20 | 6 | 46 | 25 | 60 | 6 | 5 | 48 | 10 | 13 |
| Phrynodema | 48 | 35 | 23 | 60 | 53 | 20 | 10 | 48 | 35 | 66 | 9 | 8 | 45 | 25 | 13 |
| Glossitis | 72 | 59 | 39 | 92 | 77 | 40 | 14 | 82 | 49 | 75 | 40 | 16 | 100 | 14 | 17 |
| Dry and Rough Skin | 25 | 9 | 30 | 14 | 18 | 9 | 7 | 27 | 7 | - | - | - | - | - | - |
| Loss of appetite | 32 | 46 | 18 | 60 | 44 | 22 | 12 | 50 | 28 | 42 | 22 | 14 | 58 | 10 | 10 |
| Mean No. of problems/head | 2.5 | 2.1 | 2.2 | 2.4 | 2.2 | 2.5 | 2.6 | 2.6 | 1.9 | 1.9 | 2.9 | 3.7 | 2.8 | 1.7 | 1.2 |
| Chi Square value | 28.34** | 37.93** | 9.82 | 7.44 | 78.2** | 22.24* | | | | | | | | | |

* NGE - Not Gainfully Employed

SE - Self Employed

EP - Employed Privately

* - Significant at five per cent level

** - Significant at one per cent level

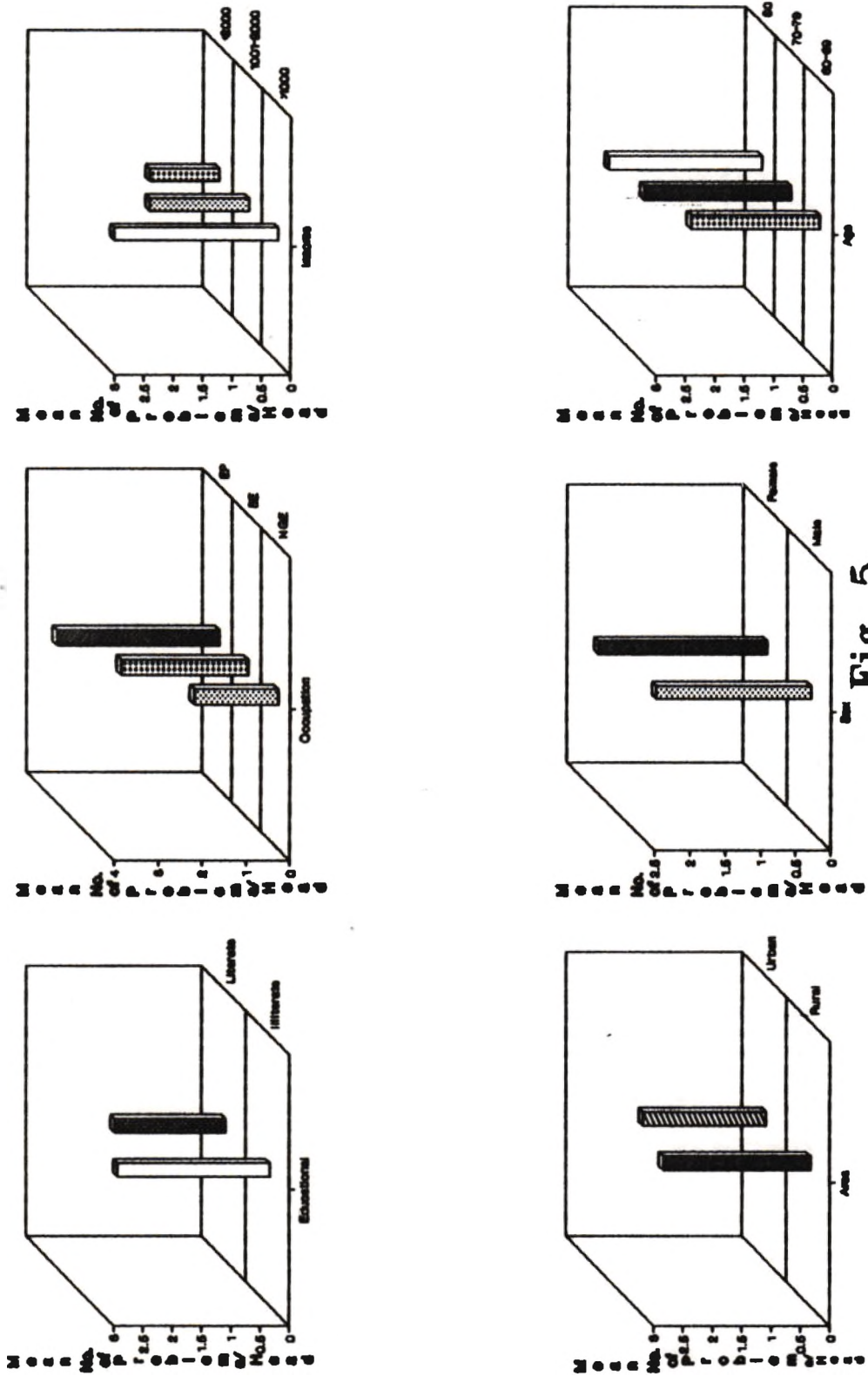


Fig. 5.

NUTRITIONAL PROBLEMS OF THE SUBJECTS

The data indicated that anaemia, angular stomatitis, spongy and bleeding gums, phrynoderma, glossitis, dry skin and loss of appetite were the commonly prevailing nutritional problems among the aged. All these problems reflected the deficiency of various nutrients.

Anaemia had been the major nutritional problem and was more widespread among the rural subjects (89.3%) than the urban subjects (62.7%). The percentage prevalence of angular stomatitis, bleeding gums, phrynoderma, glossitis, dry and rough skin were also prevailing more in the rural aged than the urban subjects. Similar finding has been reported by Kohrs et al. (1984). The mean number of problems suffered by the rural and the urban groups were 2.5 and 2.1 per head respectively. The difference in the prevalence of nutritional problems between the rural and urban groups was significant at one per cent level (Chi-square = 28.34).

The incidence of anaemia was higher (80%) among female subjects than among the males (66.6%). Next to anaemia glossitis was highly prevalent (43.8%) followed by loss of appetite (28.5%) and phrynoderma (28.5%) in the case of females and dry and rough skin (33.3%) and phrynoderma (25.5%) in the case of males. This might be due to the fact that male members worked out doors more and their skin changes were more obvious compared to females. It was observed that except in the case of dry and rough skin the

percentage prevalence of all the other nutritional problems were more in the case of female group (mean 2.4) than the male group (mean 2.2) and the difference was statistically significant at one per cent level (Chi-square = 37.93). This finding is in line with the reports of Natarajan et al. (1987) who stated that sub-clinical anaemia is common in our elderly. Anaemia may be due to other factors like worm infestation and deficiency of folic acid and vitamin B12 deficiency.

When the prevalence of deficiencies was studied in terms of educational status of the subjects, the illiterate members seemed to have a higher prevalence (mean 2.6) of all the deficiencies when compared to the literates (mean 1.9). However, the association between educational status and the prevalence of deficiencies was not statistically significant (Chi-square value = 7.44).

This non-association might be due to the reason that even though 132 members among 300 were found to be literates, the literacy level was very low. Only 1.4 per cent of the literates had crossed the high school level of education. The low level of literacy might have been the reason for not having any influence on the nutritional status of the subjects when compared with the illiterate group.

In this study the 300 subjects were classified into three main groups namely not gainfully employed, self-employed and employed privately. Among the three groups the majority of them (74.3%) were not earning and they were mainly helping in the household activities. Among these members the maximum number were suffering from anaemia, followed by glossitis, phrynoderma and bleeding gums. Among the self employed group the order of deficiencies were anaemia, glossitis, angular stomatitis followed by loss of appetite. Among the employed group which was the smallest, anaemia, glossitis and loss of appetite were highly present. Kaushik (1991) is of the view that loss of taste is one of the leading causes to loss of appetite. The statistical analysis revealed a significant association ($P < 0.01$) between occupation and the nutritional problems (Chi-square = 82.2).

Among the 300 subjects studied the maximum were in the age group of 60-69 years (N=191) followed by 70-79 years (N=81) and above 80 years (N=28). Though nutritional deficiencies were observed in all the three age categories in terms of percentage prevalences, strong differences were not recorded between the three age groups, the mean number of deficiencies being 2.2, 2.5 and 2.6 respectively for the three groups. The statistical appraisal did not show any significant association between age and the nutritional

problems (Chi-square = 9.82). Kabir (1992) states that nutritional problems become more severe when other illnesses and debility exist. This might have been the cause for not getting significant association with different age groups.

When the nutritional problems were analysed in terms of the family income of the respondents, around 99 per cent of the low income group were suffering from anaemia against 53 and 44 per cent of the aged belonging to the income ranges of Rs. 1001-2000 and above Rs. 2000 respectively. Ghosal (1982), Krishnaswamy (1986) and Aspirin (1988) have reported anaemia to be the common and highly prevalent nutritional disorder among the low income population. When the percentage prevalence of the different nutritional problems among the three income categories was considered, there was a clear declining trend in the prevalence of problems with the increase in family income. The mean number of problems suffered by the subjects in the three income groups were found to be 2.8, 1.7 and 1.2 respectively. This association was found to be statistically significant at five per cent level (Chi-square value = 22.24) and these findings are in agreement with the view of Natesan (1991) that the economically dependent aged have significantly greater number of problems than the economically independent members.

In conclusion it could be stated that the area of living, sex, occupation and income level of the subjects had an influence on the nutritional status of the aged. Any improvement in the above parameters may lead to improvement in the nutritional status.

2. Physiological Problems

Physiological problems of the aged analysed in terms of variables is presented in Table XXI and Figure 6.

TABLE - XXI

PHYSIOLOGICAL PROBLEMS OF THE AGED

Variables

| Problems | Area | | Sex | | Age in years | | | Education | | Occupation | | | Income in Rs | | |
|---------------------------|---------|-------|------|--------|--------------|-------|------|------------|----------|------------|------|------|--------------|-----------|-------|
| | Rural | Urban | Male | Female | 60-69 | 70-79 | 80 + | Illiterate | Literate | NGE | SE | EP | <1000 | 1001-2000 | >2000 |
| | N=150 | N=150 | N=90 | N=210 | N=191 | N=81 | N=28 | N=168 | N=132 | N=223 | N=58 | N=19 | N=165 | N=60 | N=75 |
| Cataract | 199 | 77 | 49 | 147 | 116 | 59 | 21 | 125 | 71 | 126 | 58 | 12 | 120 | 58 | 18 |
| Toothlessness | 93 | 87 | 42 | 138 | 100 | 60 | 20 | 115 | 65 | 100 | 52 | 28 | 127 | 24 | 29 |
| Hard of Hearing | 84 | 42 | 26 | 100 | 73 | 40 | 13 | 95 | 31 | 70 | 48 | 8 | 106 | 8 | 12 |
| Micturition problems | 24 | 24 | 13 | 35 | 25 | 18 | 5 | 34 | 14 | 14 | 30 | 4 | 32 | 6 | 10 |
| Palpitation | 23 | 42 | 7 | 58 | 40 | 18 | 7 | 43 | 22 | 44 | 15 | 6 | 38 | 9 | 18 |
| Belching | 20 | 44 | 21 | 43 | 30 | 14 | 20 | 38 | 26 | 42 | 16 | 6 | 46 | 8 | 10 |
| Dry cough/wheezing | 53 | 77 | 33 | 97 | 40 | 65 | 25 | 80 | 50 | 74 | 51 | 5 | 92 | 18 | 20 |
| Abdominal pain | 20 | 30 | 11 | 39 | 30 | 15 | 5 | 27 | 23 | 6 | 31 | 13 | 27 | 13 | 10 |
| Mean No. of problems/head | 3.4 | 2.8 | 2.2 | 5.5 | 2.4 | 3.6 | 4.1 | 3.3 | 2.3 | 2.1 | 5.2 | 4.3 | 3.6 | 2.4 | 1.7 |
| Chi-square value | 80.69** | 10.42 | | | 53.21** | | | 11.17 | | 87.83** | | | | 58.47** | |

* NGE - Not Gainfully Employed
 SE - Self Employed
 EP - Employed Privately
 ** - Significant at one per cent level

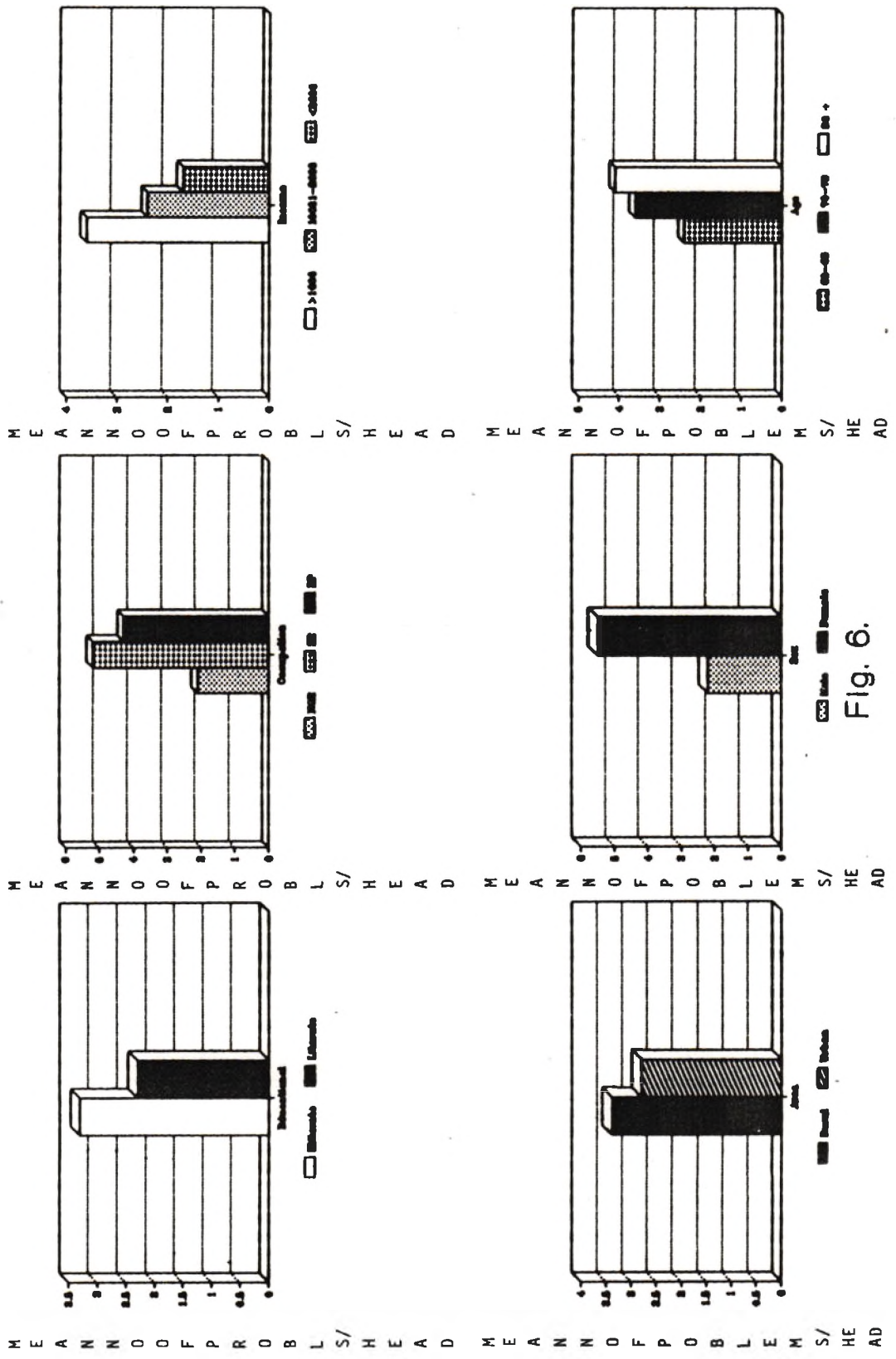


Fig. 6.
PHYSIOLOGICAL PROBLEMS OF THE SUBJECTS

The major physiological problems observed among the subjects were cataract, toothlessness, phyrrohaea, hard of hearing, bad breath, micturition and itching. Among the rural population a majority of them namely 199 out of 150 members were suffering from cataract followed by 93 members having toothlessness. Among the urban population the highest number, 87 out of 150 had toothlessness followed by 77 suffering from cataract. Young and Urban (1986) report that dental problems are the common causes contributing to inadequate food intake and poor nutrition in the elderly. It was found out that a mean of 3.4 problems were observed among the rural aged and it was 2.8 for the urban aged revealing that the aged in the rural areas had more number of problems than the urban, and this association was found to be significant at one per cent level (Chi-square = level 80.69). When the physiological problems were analysed in terms of sex, it was found out that among both the sexes cataract was found to be a predominating health problem (54.4% in male and 70.0% in female). All the problems were present in higher percentage of female population than in male population. The average number of physiological problems experienced by males was 2.2 while it was 5.5 for females. However, the association was not found to be statistically significant.

Age wise distribution of the health problems indicated that as the age increased the prevalence of toothlessness

increased and in the case of cataract the percentage of prevalence seemed to be declining with increase in age. This might be due to the reason that more number of cases in 60-69 years group were yet to undergo treatment while the older age group had already undergone the treatment. The mean number of physiological problems in the three age groups namely 60-69 years, 70-79 years and 80 and above years were found to be 2.4, 3.6 and 4.1 respectively and the association between the physiological problems and age was found to be statistically significant at one per cent level (Chi-square value = 53.21).

The results of the study has thrown light that as the level of literacy increases the incidence of physiological problems decreases. In case of every physiological problem the percentage prevalence of cases were more among the illiterate than the literate with the mean number of cases being 3.3 and 2.3 respectively. The association was not found to be statistically significant. This might be the reason that the literate took better care of their health than the illiterate and they might be availing the medical facilities to maintain their health.

Occupation seemed to play a role in maintaining the health of the individuals. It was found out that when the subjects were staying at home and taking care of household needs they were able to maintain better health in general.

The percentage of cases suffering from various physiological problems increased as the involvement in the occupation increased. This might be due to the increased strains undergone by the subjects and also due to the occupational hazards. The mean number of physiological problems per head observed among the three levels of occupation groups namely not gainfully employed, self employed and employed by outside agencies were 2.1, 5.2 and 4.3 respectively and the association was found to be statistically significant at one per cent level (Chi-square value = 87.83).

When the aged respondents were classified according to the family income and analysed for physiological problems, it was found out that the percentage prevalence of every problem was the highest among the group having an income below Rs.1000 per month. The average number of problems among this group was found to be 3.6. The number of problems suffered by the group with the income range of Rs.1001/- to 2000/- and above Rs.2000/- were found to be 2.4 and 1.7 respectively and the association between the income and physiological problems was significant at one per cent level (Chi-square = 58.47).

3. General Problems of the Aged

The non-specific general health problems complained by the aged are presented in the Table XXII and Figure 7.

TABLE - XXII

GENERAL PROBLEMS OF THE AGED (Values indicate the No. stating the problems)

| Problems | Variables | | | | | | | | | | | | | | |
|---------------------------|-------------|------------|--------------|--------------|------------|------------|------------|------------------|----------------|--------------|---------|-------------|----------------|------------|-----|
| | Area | Sex | Age in years | | | Education | Occupation | | | Income in Rs | | | | | |
| | Rural N=150 | Urban N=90 | Male N=210 | Female N=191 | 60-69 N=81 | 70-79 N=28 | 80 + N=168 | Illiterate N=132 | Literate N=223 | SE N=58 | EP N=19 | <1000 N=165 | 1001-2000 N=60 | >2000 N=75 | |
| Fatigue | 48 | 34 | 110 | 86 | 46 | 22 | 92 | 62 | 117 | 23 | 14 | 95 | 24 | 35 | |
| Abnormal sweating | 6 | 20 | 10 | 16 | - | - | 6 | 20 | - | - | - | - | - | - | |
| Sleeplessness | 55 | 64 | 28 | 91 | 70 | 35 | 14 | 79 | 64 | 37 | 18 | 98 | 7 | 14 | |
| Shortness of Breath | 72 | 58 | 28 | 102 | 68 | 42 | 20 | 72 | 61 | 51 | 18 | 90 | 20 | 20 | |
| Headache | 46 | 53 | 16 | 83 | 63 | 24 | 12 | 69 | 53 | 35 | 11 | 74 | 10 | 15 | |
| Chest pain | 67 | 58 | 25 | 100 | 64 | 52 | 9 | 76 | 51 | 47 | 17 | 110 | 7 | 8 | |
| Giddiness | 90 | 32 | 20 | 102 | 71 | 39 | 12 | 80 | 63 | 52 | 7 | 98 | 10 | 14 | |
| Body pain | 44 | 53 | 24 | 73 | 49 | 35 | 13 | 61 | 32 | 58 | 7 | 17 | 19 | 8 | |
| Oedema | 25 | 11 | 9 | 27 | - | - | - | 24 | 16 | 8 | 12 | 20 | 10 | 6 | |
| Burning sensation | 81 | 35 | 24 | 92 | 62 | 44 | 10 | 89 | 76 | 24 | 16 | 89 | 12 | 15 | |
| Numbness | 58 | 57 | 20 | 95 | 66 | 40 | 9 | 87 | 66 | 35 | 14 | 84 | 14 | 17 | |
| Constipation | 14 | 16 | 7 | 23 | - | - | - | 20 | 12 | 12 | 6 | - | - | - | |
| Bad Breath | 113 | 22 | 25 | 110 | 58 | 54 | 23 | 110 | 56 | 55 | 14 | 97 | 23 | 15 | |
| Itching | 56 | 37 | 28 | 65 | 49 | 30 | 14 | 72 | 38 | 40 | 15 | 68 | 13 | 12 | |
| Mean No. of Problems/head | 5.2 | 4.1 | 3.3 | 5.2 | 3.7 | 5.4 | 5.6 | 5.6 | 3.5 | 3.2 | 8.2 | 9.4 | 5.7 | 2.8 | 2.4 |
| Chi-Square Value | 126.92** | 14.40 | 26.56 | 63.96** | 98.97** | 79.99** | | | | | | | | | |

* NGE - Not Gainfully Employed

SE - Self Employed

EP - Employed Privately

** - Significant at one per cent level

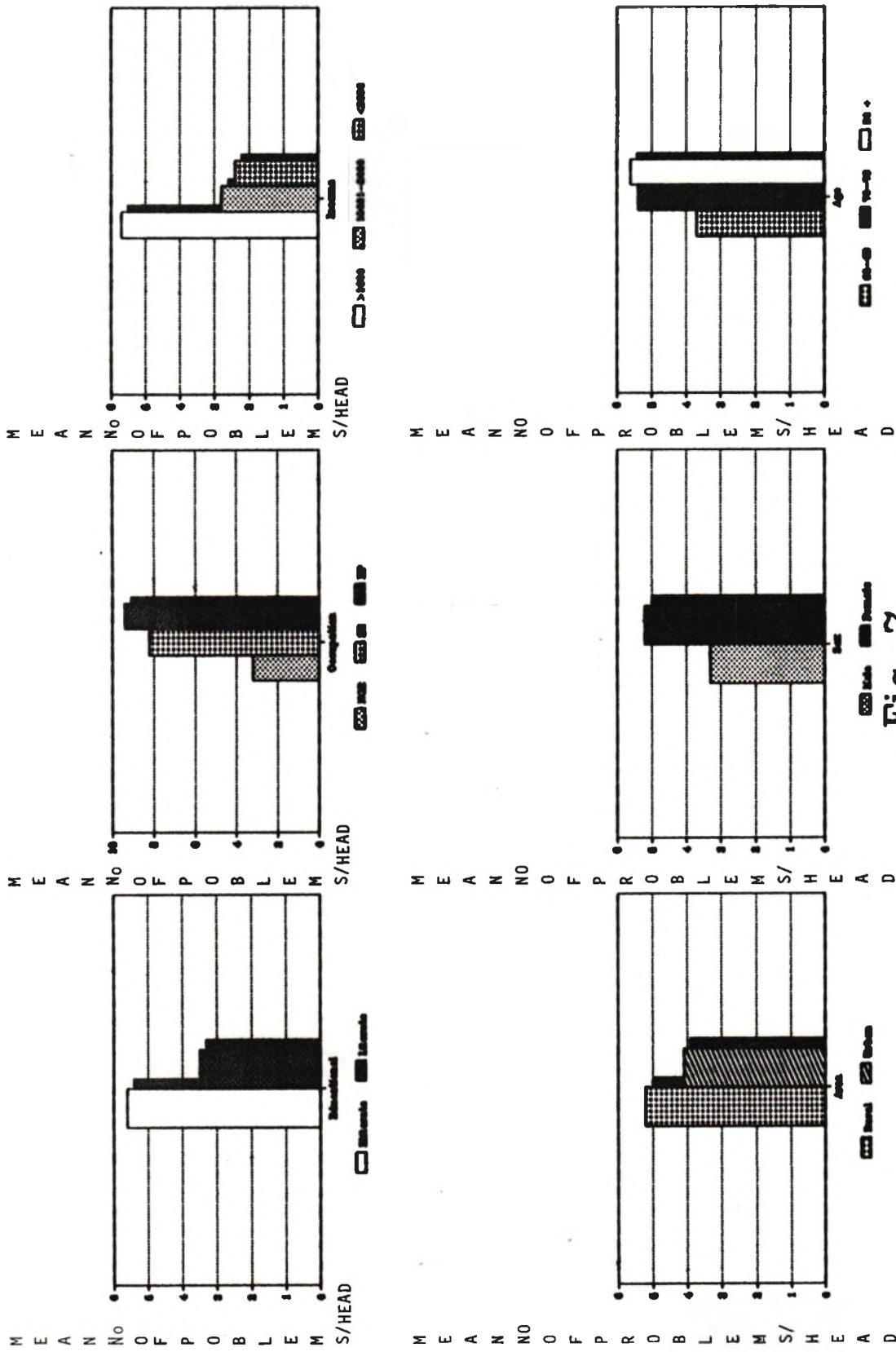


Fig. 7.

GENERAL PROBLEMS OF THE SUBJECTS

The aged members seemed to experience a lot of health problems. The problems such as general fatigue, abnormal sweating, sleeplessness, headache, body pain and constipation were present more among the urban members while shortness of breath, chest pain, giddiness, oedema, burning sensation, numbness and itching were present more among the rural subjects. Of the different problems bad breath was highly prevalent among the rural group due to poor dental hygiene while fatigue was seen more among the urban subjects. However, the mean number of complaints were more among the rural aged (5.2) when compared to the urban aged (4.1). The difference in the prevalence of general problems between the rural and urban groups was statistically significant at one per cent level (Chi-square = 126.92) It is clear from above table that the respondents from urban locality had relatively lesser health problems than rural respondents as viewed by Goyal (1992).

When sex-wise comparison was made the females suffered from more number of problems than the males. It was mainly due to the reasons that more females were illiterate and they had the tendency to postpone the treatment for their problems. However, the presence of general problems between the sex was not statistically significant.

As the age increased the number of problems experienced increased and the literate subjects were better off in their health than the illiterate members. There was an association between the education level of the subjects and the prevalence of general health problems and it was statistically significant at one per cent level (Chi-square = 63.96). The subjects who were not involved in gainful employment and remained restfully at home had less number of problems (mean 3.2) when compared to self employed group (8.2) and those who were employed elsewhere (9.4). The statistical analysis revealed the association between occupation and general health problems of the aged to be significant at one per cent level (Chi-square = 98.97). As the income level of the families increased the number of problems seemed to decline. It might be due to better health care and food intake with the increased income of the families. The association between income and general problems was statistically significant at one per cent level (Chi-square = 79.9).

These findings closely corroborate other Asian studies on the health status of the elderly. Data from WHO 1984 survey of elderly population (60 +) in Fiji, Malaysia, the Philippines and South Korea indicate that nearly one third to two thirds of respondents were physically fit (Goyal, 1992).

In a generalised perspective, it can be said that the health status of the elderly is not very poor. Moreover, with a little health consciousness, it can be vastly improved.

Hardness of hearing, bad breath, micturition problems and itching were found to be more prevalent among the persons of the aged 70+ than among the persons below 70 years. This coincides with the opinion of Masaro (1990) that diseases are increasingly prevalent with advancing age and may underline much of the physiological deterioration.

4. Prevalence of Diseases

Table XXIII presents the prevalence of various diseases among the 600 subjects studied.

TABLE - XXIII

PREVALENCE OF DISEASES AMONG THE AGED

| Diseases | Percentage of respondents | | | | | | | | | | | | | | |
|---------------------------|---------------------------|-------------|--------------|--------------|------------|--------------|------------|------------------|---------------|-----------|----------|----------|-------------|-----------------|-------|
| | Area | Sex | Age in years | Education | Occupation | Income in Rs | | | | | | | | | |
| | Rural N=300 | Urban N=390 | Male N=361 | Female N=172 | 60-69 N=67 | 70-79 N=67 | 80 + N=315 | Illiterate N=285 | Literate N=84 | NGE N=127 | SE N=362 | EP N=109 | <1000 N=109 | 1001-2000 N=129 | >2000 |
| Peptic ulcer | 6.3 | 2.0 | 6.2 | 3.1 | 4.4 | 3.5 | 1.5 | 3.5 | 0.6 | 0.8 | 6.0 | 13.4 | 5.2 | 2.8 | 2.3 |
| Diabetes Mellitus | 3.3 | 3.0 | 1.9 | 3.8 | 2.5 | 4.1 | 1.5 | 2.9 | 2.6 | 1.5 | 1.2 | 6.2 | 2.2 | 2.8 | 6.2 |
| Asthma | 12.3 | 4.0 | 8.1 | 8.2 | 8.3 | 8.1 | 7.5 | 8.3 | 8.1 | 9.0 | 14.3 | 1.6 | 10.0 | 6.4 | 4.7 |
| Rheumatism | 8.5 | 6.3 | 6.7 | 7.9 | 7.2 | 7.6 | 9.0 | 7.9 | 7.0 | 9.0 | 10.7 | 0.8 | 5.5 | 7.3 | 13.2 |
| Pyorrhoea | 7.7 | 21.3 | 8.1 | 17.9 | 11.6 | 17.4 | 22.4 | 18.1 | 10.5 | 10.0 | 41.7 | 10.2 | 14.4 | 22.9 | 7.6 |
| Hypertension | 28.7 | 15.0 | 12.4 | 21.8 | 22.2 | 20.9 | 22.4 | 27.3 | 15.8 | 22.1 | 39.3 | 9.4 | 22.1 | 19.3 | 31.0 |
| Mean No. of diseases/head | 0.67 | 0.52 | 0.53 | 0.53 | 0.56 | 0.62 | 0.64 | 0.68 | 0.45 | 0.52 | 1.13 | 0.42 | 0.59 | 0.62 | 0.65 |
| t/f value | 0.0 | 0.489 | 2.844** | 0.0 | 4.875** | 38.64** | | | | | | | | | |

* NGE - Not Gainfully Employed

SE - Self Employed

EP - Employed Privately

** - Significant at one per cent level

The commonly prevailing diseases among the aged subjects were peptic ulcer, diabetes mellitus, asthma, rheumatism, pyrrhoea and hypertension. However, the occurrence of many of these diseases was below 10 per cent. According to WHO (1980) and Natarajan (1986) the incidence of diabetes mellitus ranges from 2-30 per cent among the elderly population.

Among the rural (28.7%) as well as the urban (15%) aged, hypertension seemed to be the major disease followed by asthma (12.3%) in rural areas and pyorrhoea (21.3%) in urban areas. When the mean number of diseases suffered by the male and female members were considered no difference between the sexes was observed. As the age increased the number of problems gradually increased. The mean number of diseases suffered among the three age groups were 0.56, 0.62 and 0.64 respectively. However, the literates seemed to take care of their health far better (mean 0.45) than the illiterate (mean 0.68) group. The occurrence of every disease was found to be more among the illiterate population when compared against the literate population.

Among the three occupation groups the people who were self-employed had the maximum number of diseases than the other two groups. Also when the family income increased the

mean number of diseases suffered by the aged increased (mean 0.59, 0.62 and 0.65 respectively).

The survey data also revealed the presence of problems such as fluorosis, thyroid enlargement, Parkinson's disease, arthritis etc., in a very negligible number of cases.

The interpretation of the results revealed that in the rural areas with the lesser availability of the medical facilities the health of the aged was neglected to a greater extent than in the urban areas. The females though had more number of deficiency diseases they were not suffering from more number of specific disease conditions when compared to males. This might also be due to the fact that the diseases among the female remained unidentified. Natarajan and Shanthi (1990) stated that male admissions were thrice as against females in the geriatric ward. It could be that the females hesitate to show out their illness and tend to suffer in silence. The relationship between the age and diseases proved that as the age increased the manifestation of diseases were more obvious and severe making it possible to identify the problems easily.

With better education it must be possible for the aged to prevent or control the disease conditions and enjoy better health status. When people were self employed the care taken for the personal health was rather limited and

this group suffered from number of diseases because of their negligence of health.

When the family income increased the activity of the members decreased leading to more health problems. Hence, the health problems could be controlled among the aged through proper activity, education and better health care.

It was noticed that eight per cent of the rural and 27 per cent of the urban members among the total of 600 studied went to physicians either to the Homeopathy or to Siddha for treatment and all the others followed home remedies without going to the physicians.

5. Smoking, Drinking and other Habits Found Among the Aged

Table XXIV presents the smoking, drinking and other habits present among the aged subjects in this study.

TABLE - XXIV

HABITS OF THE SELECTED AGED

Percentage of respondents

| Habits | Area | Sex | Age in years | Education | Occupation | Income in Rs |
|---|-------------|-------------|------------------|---------------------|------------------|-----------------------|
| | Rural Urban | Male Female | 60-69 70-79 80 + | Illiterate Literate | NGE SE EP | <1000 1001-2000 >2000 |
| | N=300 | N=210 N=390 | N=172 N=67 | N=315 N=285 | N=389 N=84 N=127 | N=362 N=109 N=129 |
| 1. Tobacco and betel leaves chewing | 30.7 17.3 | 16.2 28.2 | 22.7 24.4 29.9 | 34.9 11.9 | 26.2 13.6 8.6 | 28.2 19.3 16.3 |
| 2. Chewing pan | 6.0 1.0 | 1.9 4.4 | 3.3 2.9 6.0 | 4.4 2.5 | 3.9 7.1 0.0 | 3.9 2.8 3.1 |
| 3. Alcohol drinking | 0.3 - | 0.5 - | 0.3 - | 0.3 - | 0.3 - | 0.3 - |
| 4. Smoking | 0.7 1.0 | 1.9 0.3 | 0.8 - 3.0 | 1.0 0.7 | 0.8 2.3 - | 0.8 1.8 - |
| 5. Using snuff | 0.7 0.3 | 0.5 0.5 | 0.5 0.6 0 | 0.3 0.7 | 0.3 0 0 | 0.6 0.9 - |

* NGE - Not Gainfully Employed
SE - Self Employed
EP - Employed Privately

It was found out that a higher percentage of rural aged (30.7%) had the habit of chewing tobacco and betal leaves when compared to urban population (17.3%). Similarly mere pan chewing was also found to be more among the rural aged. Also it was found out that the two major habits were prevalent more among males than females. As the age increased the chewing habits was found to be on the increase and it was more among the illiterates than the literates.

When the people were confined to their houses engaged in more household activities, they developed stronger habits of chewing tobacco and betal leaves. It was also found out that among the three income groups more in the lowest income range were using tobacco and betal leaves. This is a common observation in the low income families where they consumed less food and chewed quite often tobacco and betal leaves as a habit. This habit reduced their food consumption leading to nutritional deficiencies.

Habits such as alcohol drinking, smoking and using snuff were present only in a negligible percentage of subjects both in the rural as well as in urban areas. This might be due to the reason that the expensive habits had to be dropped in old age as their capacity to spend on drinks and cigarettes decreased drastically.

E. NUTRITIONAL STATUS OF THE AGED**1. Mean Food Intake of the Selected Aged Subjects**

Table XXV presents the mean food intake of the selected respondents, arrived through three day food weighment survey. For comparison purposes balanced diets suggested by Thimmayamma (1993) for the aged subjects have been used.

TABLE - XXV
 MEAN FOOD INTAKE OF THE SELECTED SUBJECTS (in g)

| Aspects | Suggested Dietary allowances [#] | | Area | | Sex | | Income | | |
|------------------------|---|--------------|----------------|---------------|---------------|----------------|------------------|--------------------|-----------------|
| | Male g/day | Female g/day | Urban N=30 | | Rural N=30 | | High income N=20 | Middle income N=20 | Low income N=20 |
| | | | N=30 | N=30 | N=30 | N=30 | N=20 | N=20 | N=20 |
| Cereals | 325 | 270 | 353 +18.7 | 414 +39.2 | 405 +24.6 | 363 +34.4 | 391 +31.4 | 397 +33.4 | 363 +22 |
| Pulses | 40 | 40 | 20.4 -49 | 37 -7.5 | 40.8 +2 | 39.9 -0.003 | 42.7 +6.8 | 40.9 +2.3 | 37.3 -6.8 |
| Green leafy vegetables | 100 | 100 | 21.0 -79 | 25.4 -74.6 | 21.5 -78.5 | 25.1 -74.9 | 37.1 -62.9 | 25.9 -74.1 | 6.8 -93.2 |
| Roots and tubers | 50 | 50 | 42.6 -14.8 | 45.8 -8.4 | 41.6 -16.8 | 47.0 -6 | 50 0 | 51.3 +2.6 | 31.3 -37.4 |
| Others | 50 | 50 | 37.4 -25.2 | 44.7 -10.6 | 43.0 -14 | 39.1 -21.8 | 50.5 +1 | 37.3 -25.4 | 35.2 -29.6 |
| Fruits | 30 | 30 | 34.1 +8.2 | 48.4 +61.3 | 50.2 +67.3 | 32.4 +8 | 64.8 +116 | 32.9 +9.7 | 26.3 -12.3 |
| Milk and its products | 200 | 200 | 229.1 +14.5 | 186.7 -6.7 | 232.0 +16 | 184.5 -7.8 | 322.8 +61.4 | 167 -16.5 | 134.8 -32.6 |
| Flesh foods | 30 | 30 | 2.9 -90.3 | 7.9 -73.7 | 5.3 -82.3 | 5.6 -81.3 | 4.3 -85.7 | | 11.9 -60.3 |
| Fats and oils | 20 | 20 | 11.8 -41 | 10.2 -49 | 10.5 -47.5 | 13.2 -34 | 11.4 -43 | 10.2 -44 | 11.4 -43 |
| Sugar and jaggery | 20 | 20 | 33.3 +66.5 | 11.8 -41 | 24.4 +22 | 20.8 +4 | 16.1 -19.5 | 26.7 +33.5 | 24.8 +24 |

[#] Thimmayamma (1993)

a. Cereals

It was found out that the intake of cereals by all the aged members was adequate when compared against the suggested levels of 325 g for males and 270 g for females. Urban members consumed more cereals (414 g) than the rural subjects (353 g) and the males consumed more cereals (405 g) than the females (363 g). The intake of cereals by the low income families was found to be the lowest (363 g) while the other two groups had almost the same intake, 397 g for middle income group and 391 g for high income group.

b. Pulses

When the intake of pulses was considered, a definite trend was observed among the income groups, sex as well as the area of living. On an average it was found out that the mean intake of males was 40.8 g and female was 39.9 g. The rural population consumed around 20.4 g pulses per day while the urban subjects consumed 379g per day and as the family income increased the intake of pulses also increased.

c. Green Leafy Vegetables

It was found out that almost all the groups studied had deficient intake of leafy vegetables (21.5 g). It varied from 0 to 36 g for males with a mean of 21.5 g and 0 to 68.4 g for females with the mean intake of 25.1 g. The intake by the females was found to be slightly higher than that of the

males. Among the three income groups the low income groups had the meagre intake of leafy vegetables (6.8 g) when compared with the middle income group (25.9 g) and the high income group (37.1 g). It was noted that the intake of greens in higher income group was higher than that of the other income groups.

d. Roots and Tubers

The mean intake of roots and tubers among the rural and the urban respondents was found to be 42.6 g and 45.8 g, respectively against the suggested allowance of 50 g per day. Female members were found to consume more root vegetables (47.0 g) when compared to male members (41.6 g). The intake of roots was found to be sufficient among high and middle income groups while it was deficient among the low income subjects. The main root vegetables consumed by the subjects included potatoes and onions.

e. Other Vegetables

Except the subjects belonging to high income group all the others consumed less than 50 g of other vegetables. It was inferred that the intake was more in urban areas, among males and in those belonged to high income group.

f. Fruits

The suggested allowances for the balanced diet indicate a requirement of 30 g of fruits per day for both males and

females. The type of fruits consumed by the subjects in the study were mainly banana, papaya and tomatoes. It was found out that except in low income group where the mean intake was 26.3 g in all the other groups the subjects consumed more than 30 g, of fruits per day. Compared to the rural areas (34.1 g) the mean intake of fruits in the urban areas was more (48.4 g) and the males consumed 50.2 g of fruits while the intake by the females was found to be 32.4 g per day. The intake of fruits was more among the high income group (64.8 g) followed by middle income group (32.9 g) and low income group (26.4 g).

g. Milk and its Products

The intake of milk by the aged was not very discouraging among the different groups categorised. The rural subjects had a mean intake of 229.1 g as against the intake of urban subjects 186.7 g. This might be due to more availability of milk in the rural areas and also the rearing of the milch animals in the rural families. The mean intake of male and female subjects were found to be 232.0 and 184.5 g respectively. Income of the families also had the influence on intake of milk and milk products. As the income of the families increased the inclusion of milk and milk products was found to be on the increase.

h. Flesh Foods

The suggested balanced diet indicates the requirement of 30 g of flesh foods per day per head. Even though all the subjects were non-vegetarians they included flesh foods very occasionally and during the survey period only the rural males in the high income groups and urban male and female in the low income group happened to include non-vegetarian items and when the average intake was computed the figures projected a meagre intake among all the groups.

i. Fats and Oils

The recommended intake of visible fats and oils for the male and female population is 20 g/day. None of the subjects met the requirements for fats and it was found out that the mean intake of fats in the rural and urban areas were 11.8 and 10.2 g respectively. The consumption of fats by the females was found to be slightly higher than that of the males. The high and low income group subjects consumed a mean intake of 11.4 g of fat while the middle income group consumed 10.2 g per day.

j. Sugar and Jaggery

The mean intake of sugar and jaggery among the rural population was found to be 33.3 g against the intake of 11.8 g among the urban subjects. It was noticed that the rural aged used sugar as a side dish instead of pickles and

chutneys with all the main items of the diet. Males consumed a mean amount of 24.4 g while the females consumed 20.8 g per day. The members belonging to high income group consumed the least amount of sugar 16.1 g followed by middle income group 26.7 g and low income group 24.8 g.

In general it was observed that the aged subjects in the present study were consuming reasonably adequate diets. Deficiencies in the intake of green leafy vegetables, flesh foods and fats and oils were more marked than the other foods.

2. Mean Nutrient Intake of the Selected Aged Subjects ,

Table XXVI and Figures 8, 9 and 10 present the mean nutrient intake of the 60 aged respondents distributed in terms of sex, area of living and family income. All the subjects selected for food intake survey belonged to the age group of 60-69 years and they all belonged to the category of not gainfully employed group. The individual values are presented in Appendix III.

TABLE - XXVI

MEAN NUTRIENT INTAKE OF THE SELECTED RESPONDENTS

| Nutrients | Recommended Dietary allowances [#] | | Area | | Sex | | Income | | | | | |
|-----------------------------|---|--------|-------|-------|-------|-------|-----------|-----------|------------------|--------------------|-----------------|-----------|
| | Male | Female | Rural | | Urban | | 'T' value | 'T' value | High income N=20 | Middle income N=20 | Low income N=20 | 'F' value |
| | | | N=30 | N=30 | N=30 | N=30 | | | | | | |
| Energy (kcal) | 1973 | 1785 | 1968 | 1887 | 0.80 | 2008 | 1847 | 0.02 | 1888 | 2071 | 1822 | 0.507 |
| | | | +4.7 | +0.43 | | +1.8 | +3.5 | | +0.47 | +10.2 | -3 | |
| Protein (g) | 55 | 45 | 46.9 | 47.9 | 0.48 | 47.2 | 47.7 | 0.00 | 52.5 | 46.9 | 43 | 0.01 |
| | | | -6.2 | -4.2 | | -14.2 | +6 | | +5 | -6.2 | -14 | |
| Fat (g) | 50 | 50 | 35.7 | 30.1 | 1.09 | 35.5 | 30.2 | 1.49 | 43.2 | 28.1 | 27.3 | 5.204** |
| | | | -28.6 | -39.8 | | -29 | -39.6 | | -13.6 | -43.8 | -45.4 | |
| Calcium (mg) | 881 | 865 | 519.3 | 445.8 | 0.85 | 483.7 | 481.7 | 0.33 | 693.3 | 439.4 | 314.9 | 8.127** |
| | | | -40.5 | -48.9 | | -45.1 | -44.3 | | -20.6 | -49.7 | -63.9 | |
| Iron (mg) | 42 | 38 | 25.8 | 26.9 | 0.51 | 31.5 | 27.3 | 0.32 | 30.8 | 27.2 | 21.2 | 1.22 |
| | | | -35.5 | -32.8 | | -25 | -28 | | -23 | -32 | -47 | |
| β carotene (μ g) | 3992 | 3460 | 2938 | 2611 | 0.22 | 2766 | 2682 | 0.36 | 3976 | 2797 | 1400 | 3.57* |
| | | | -21.1 | -29.9 | | -30.7 | -22.5 | | +6.7 | -24.9 | -62.4 | |
| Thiamine (mg) | 1.2 | 1.2 | 1.26 | 1.28 | 0.44 | 1.22 | 1.31 | 0.65 | 1.37 | 1.28 | 1.15 | 0.43 |
| | | | +5 | +6.7 | | +1.7 | +9.2 | | +14.2 | +6.7 | -4.2 | |
| Riboflavin (mg) | 1.1 | 1.0 | 0.89 | 0.84 | 0.35 | 0.88 | 0.84 | 0.69 | 1.16 | 0.76 | 0.65 | 9.57** |
| | | | -15.2 | -20 | | -20 | -16 | | +10.5 | -27.6 | -33.3 | |
| Vit. C. (mg) | 40 | 40 | 58.3 | 53.6 | 0.13 | 55.87 | 55.98 | 0.29 | 83.75 | 61.7 | 22.33 | 3.27* |
| | | | +45.8 | +34 | | +39.7 | +40 | | +109.4 | +54.3 | -44.1 | |

** - Significant at 1 % level

* - Significant at 5 % level

Thimmayamma (1993)

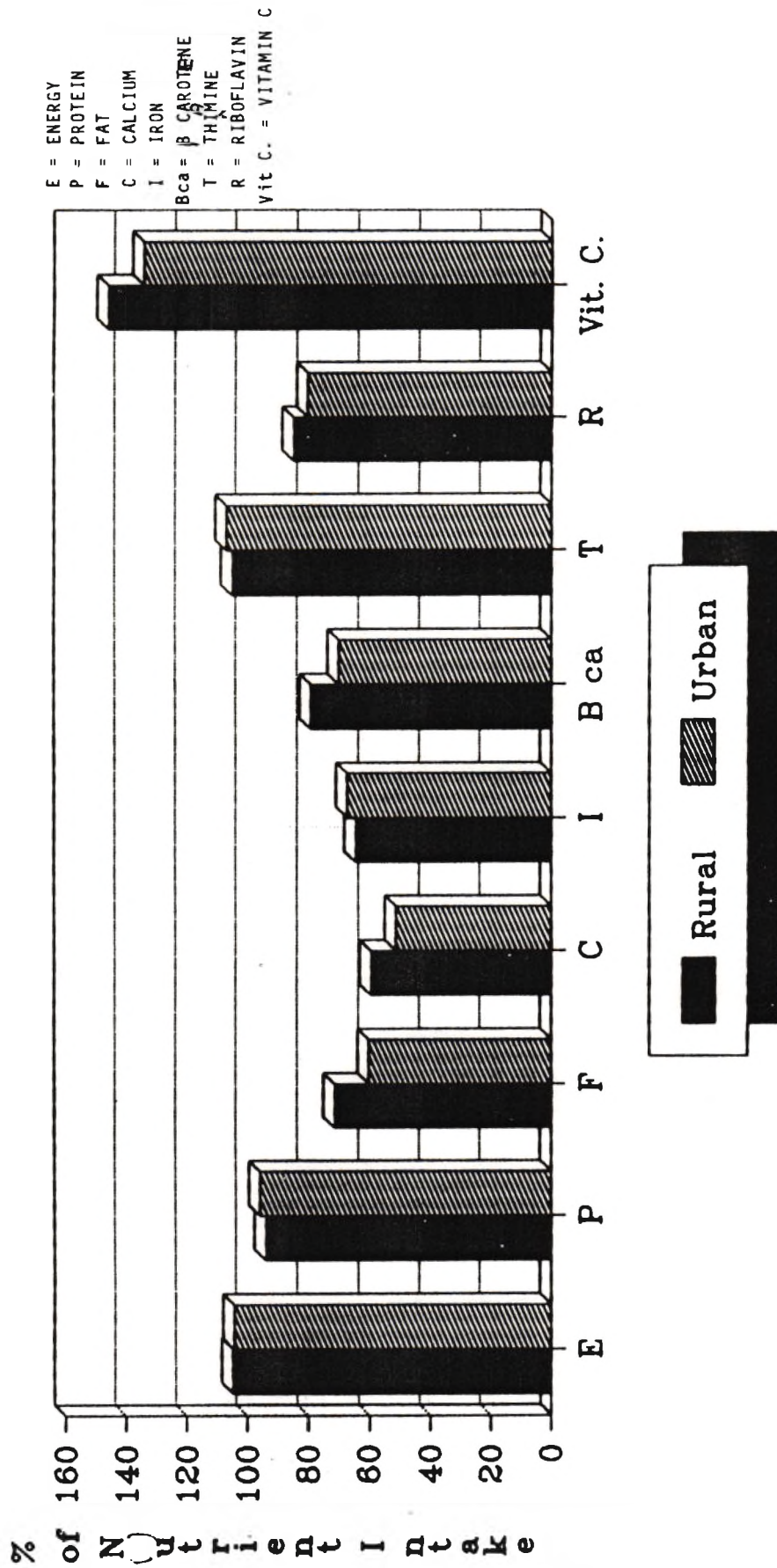


Fig. 8.
 AREA WISE MEAN NUTRIENT INTAKE OF THE
 AGED

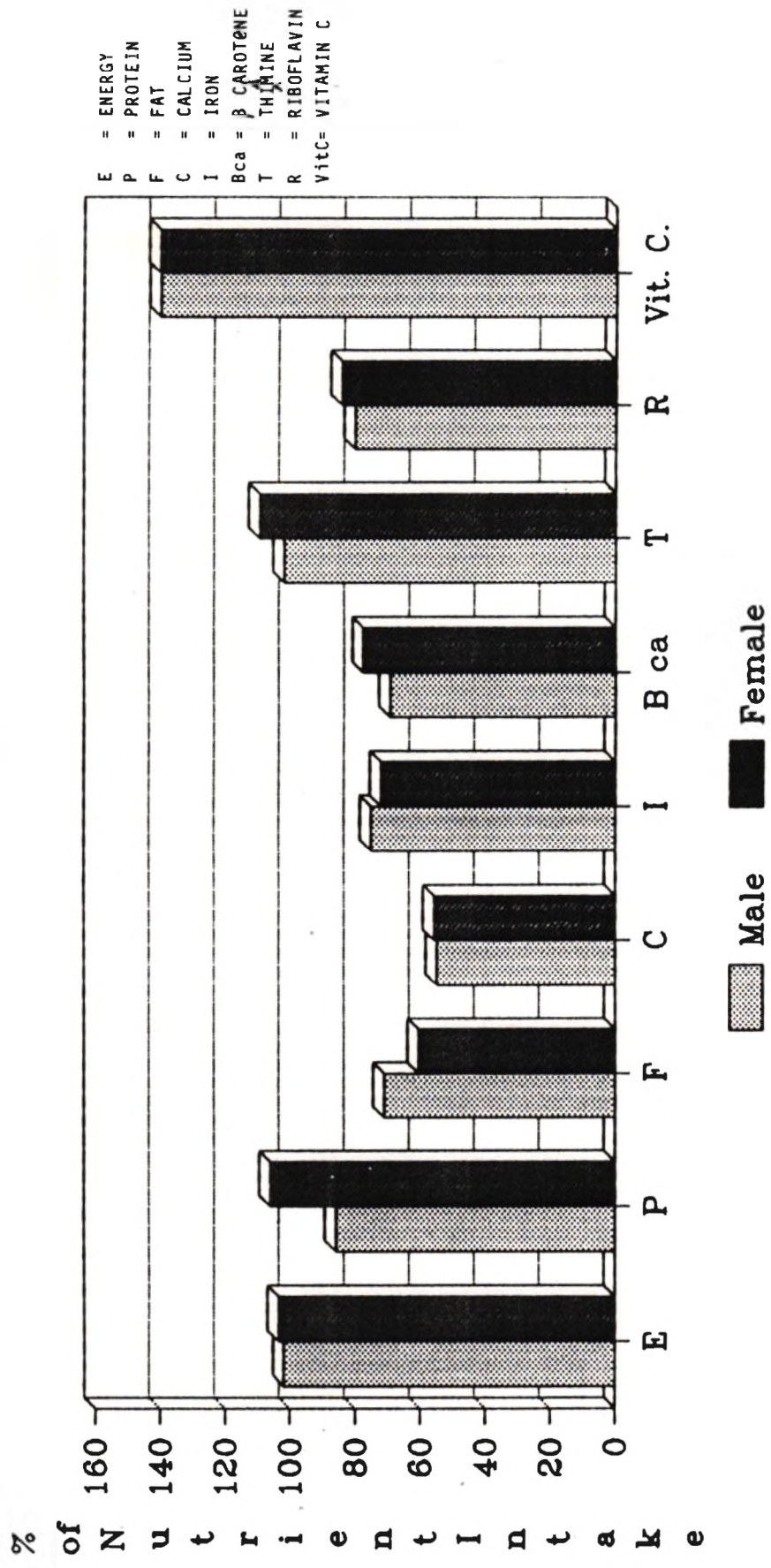


Fig. 9.
SEX WISE MEAN NUTRIENT INTAKE OF THE
AGED

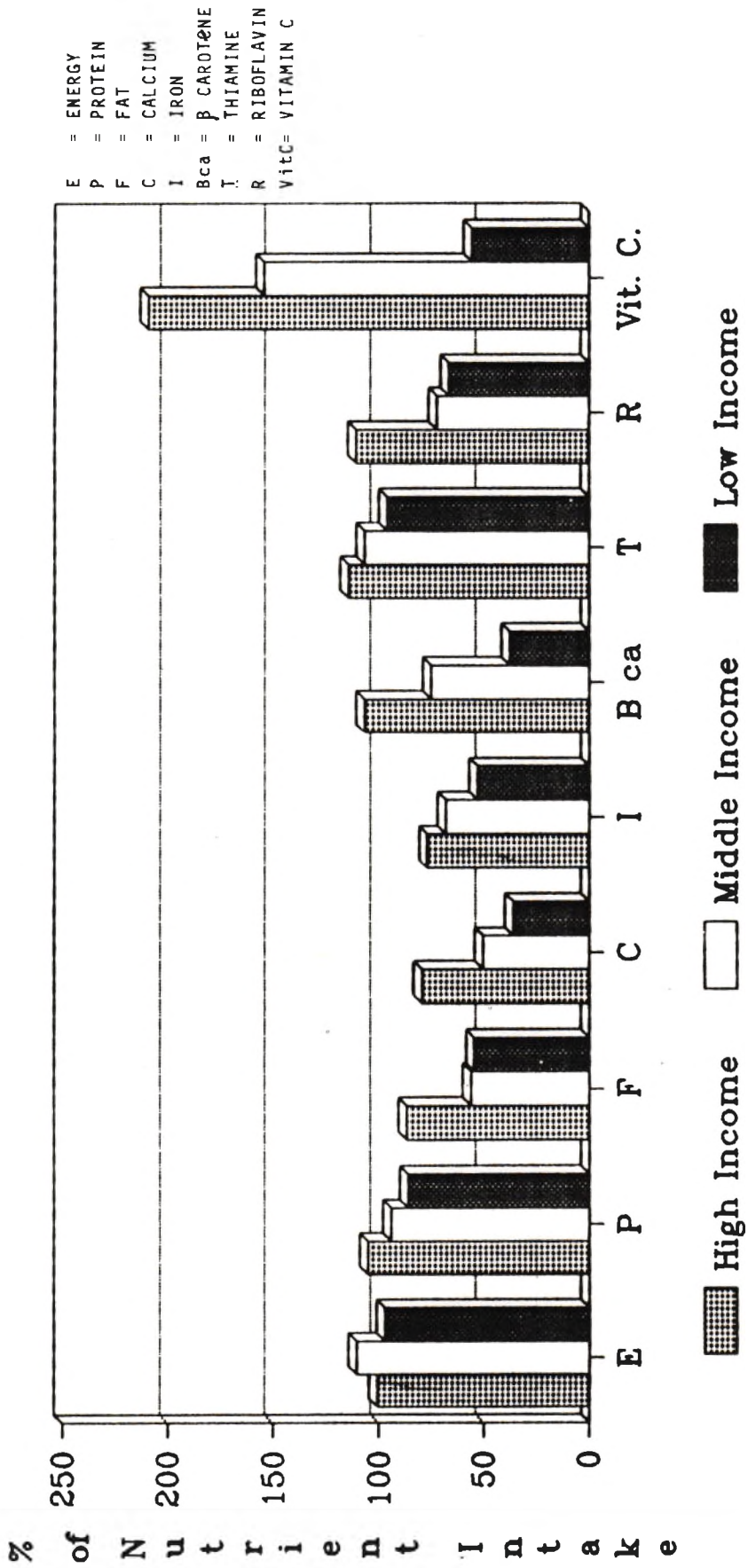


Fig. 10.
INCOME WISE MEAN NUTRIENT INTAKE OF THE
AGED

The results of the diet survey revealed that all the subjects in the rural as well as the urban areas met their requirements for energy (1968 kcal for rural and 1887 kcal for urban), thiamine (1.26 mg for rural and 1.28 mg for urban) and vitamin C (58.3 mg for rural and 53.6 mg for urban) through their home diets. Because their diets were mainly cereal based it was not very difficult to meet the requirements for energy in both the groups. Since the mean intake of pulses among the rural and urban groups were only 20 and 37 g per day respectively as against the suggested intake of 40 g, their diets were found to be deficit in protein content by 6.2 per cent and 4.2 per cent respectively. Though the visible fat intake among the rural and urban groups were 11.8 g and 10.2 g respectively as against the suggested allowance of 20 g the total fat intake were found to be 35.7 g and 30.1 g respectively. A study conducted by Natarajan et al. (1989) showed that the fat intake in the subjects studied was less than 50 per cent of the recommended fat allowances and concluded that the low lipid profile in the elderly is directly related to both the dietary factor and the ageing process. Since the requirement of calcium in old age is above 850 mg per day which is more than double that of the normal adult requirement the deficiencies observed among the rural and urban population were slightly high i.e., 48.5 and 46.9 per cent

respectively. The very low intake of green leafy vegetables among the aged members was reflected in the deficient content of iron and beta carotene in the diets of both the groups. However, due to their intake of commonly available fruits such as tomatoes in adequate amounts, both the rural (58.3 mg) and urban (53.6 mg) individuals consumed adequate quantity of ascorbic acid. The differences in the intake of nutrients observed among the rural and urban groups were not found to be statistically significant.

When the nutrient intake of males and females were compared, it was found out that the calories, fat, calcium, iron, beta carotene and riboflavin contents were more among the male population than the female population and the intake of protein, riboflavin and vitamin C were almost the same among the two groups. However, since the RDA for females for energy, protein, calcium, iron and beta carotene were less than that of the males, the percentage deficits were found to be higher in the case of males than the females. But the differences in the intake of nutrients between the male and female population were not statistically significant. Natarajan et al. (1987) have found out that the calcium, iron, vitamin A and thiamine intakes were less in 68, 58, 85 and 94 per cent of the subjects respectively.

Mc Candy (1985) reported that 60 per cent of the males and females had a low intake of calcium and calcium absorption also decreases with age. Natarajan et al. (1987) reported that the intake of calories, protein, vitamins and minerals was lower among the elderly when compared to recommended allowances.

It was observed that as the income of the families increased the intake of nutrients by the aged also increased. Among the high income group except for the intake of fat, calcium and iron, all the other nutrients were found to be adequate. In the case of low income group the intake of all the nutrients were found to be deficient. The statistical appraisal revealed a significant relationship between the income of the families and the intake of fat, calcium, beta carotene, riboflavin and vitamin C. Hence, it was concluded that the main factor which influenced the intake in the old age was income of the families.

3. Anthropometric Measurements

a. Heights and Weights

Table XXVII presents the mean height and weight measurements of the subjects studied.

TABLE - XXVII

MEAN HEIGHT AND WEIGHT MEASUREMENT OF THE SUBJECTS

| Criteria | Sex | Area | Mean | \pm SD | Groups Compared | 't' value |
|--------------|--------|----------------|-------|-------------|-----------------|-----------|
| Height (cms) | Male | Rural (No.92) | 159.4 | \pm 6.25 | RM Vs UM | 0.9286 |
| | | Urban (No.118) | 158.8 | \pm 11.14 | | |
| | Female | Rural (No.208) | 148.0 | \pm 7.82 | RF Vs UF | |
| | | Urban (No.182) | 149.1 | \pm 8.29 | | |
| Weight (kgs) | Male | Rural (No.92) | 45.3 | \pm 9.71 | RM Vs UM | 4.87** |
| | | Urban (No.118) | 56.6 | \pm 9.18 | | |
| | Female | Rural (No.208) | 40.0 | \pm 10.62 | RF Vs UF | |
| | | Urban (No.182) | 49.7 | \pm 12.89 | | |

** - Significant at one per cent level

The male subjects in the rural and urban areas recorded 159.4 cm and 158.8 cm height respectively. The female subjects in the rural and urban areas registered mean body heights of 148.0 cm and 149.1 cm respectively. The difference between the rural and urban groups was very low and it was not found to be statistically significant.

The mean body weights recorded by the rural and urban male subjects were 45.3 and 56.6 kg respectively. In the case of females the weights recorded were 40.0 and 49.7 kg respectively.

In the case of both heights and weights the male members recorded greater measurements than the females. Though the rural males were slightly taller than the urban males they were weighing far below the urban subjects and the difference in the mean weights recorded were found to be statistically significant at one per cent level. Similarly the differences in the weights between males and females also was significant at one per cent level. It could be concluded that in the urban areas because of better income, literacy level, greater food intake and health care the subjects were weighing more than their rural counterparts. Side et al. (1991) reported that both regional (rural and urban) and sexual differences in anthropometry seemed to be consistent with the results of the dietary survey. This finding is in line with the present investigation.

b. Body Mass Index

Table XXVIII and Figure 11 present the Body Mass Index (BMI) of the four groups of subjects and grading of the subjects for obesity based on BMI.

TABLE - XXVIII
GRADING THE SUBJECTS FOR OBESITY BASED ON BODY MASS INDEX (BMI)

| Sex | Area | BMI Mean \pm SD | Group Compared | 't' value | Grading of obesity (BMI) (Percentage of respondents) | | | |
|--------|----------------------|----------------------|-------------------|--------------|---|--------------------|-------------------|-------------------|
| | | | | | Not obese < 25 | Grade I 25-29.9 | Grade II 30-40 | Grade III > 40 |
| Male | Rural-RM (No.92) | 17.79 \pm 3.62 | | 2.54* | 100.0 | - | - | - |
| | Urban-UM (No.118) | 23.70 \pm 12.75 | RM Vs UM | | 77.1 | 22.9 | - | - |
| Female | Rural-RF (No.208) | 18.12 \pm 4.23 | | 5.30** | 94.7 | 3.4 | 1.9 | - |
| | Urban-UF (No.182) | 22.2 \pm 6.10 | RF Vs UF | | 70.9 | 15.4 | 10.4 | 3.3 |

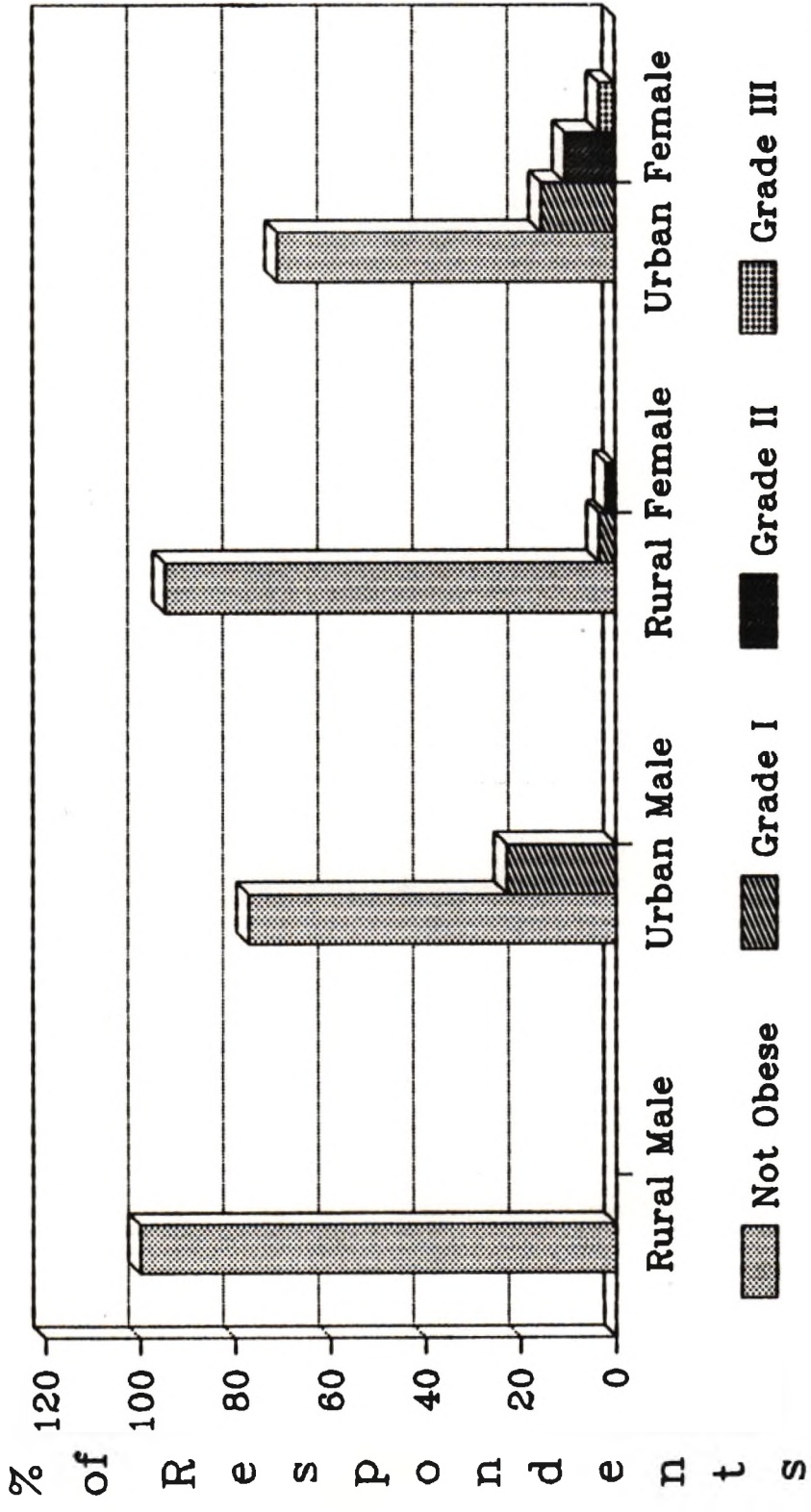


Fig. 11.
GRADING OF OBESITY BASED ON BODY MASS
INDEX

The mean Body Mass Index of the rural and urban males were found to be 17.79 and 23.70 respectively and the values for the rural and urban females were found to be 18.12 and 22.2 respectively. Since the BMI is arrived by integrating weights and heights, the significant difference observed in the weights reflected in the BMI also. Hence, the urban population recorded a significantly greater BMI than their respective rural counterparts ($P < 0.01$). When the subjects were graded (Wyngaarden, 1992) for obesity based on the BMI it was found out that almost all the rural male subjects were found to be normal with BMI values below 25. In the case of urban male population, the majority of them (77.1 per cent) were not obese while 22.9 per cent were in grade I obesity with BMI range of 25.0 to 29.9.

The BMI classification of the female aged reflected the same trend as seen in the case of body weights. Around 1.9 per cent of the rural female subjects were in grade II obesity, 3.4 per cent were in grade III obesity, while 94.7 per cent were not obese. Of the four groups studied, obesity was more prevalent among urban female subjects, with 3.3 per cent in grade III obesity, 10.4 per cent in grade II obesity, 15.4 per cent in grade I obesity and 70.9 per cent being not obese.

It could be concluded that the urban female subjects weighed more than the expected weights and the obesity was prevalent more among this group than the other groups of aged. Natarajan et al. (1987) state that 17 per cent of the aged subjects are obese which is more prevalent in women than in men.

2. Blood Haemoglobin Levels

Table XXIX and Figure 12 present the mean blood haemoglobin level of 600 aged subjects, estimated through cyanmethaemoglobin method using the finger prick blood samples

TABLE - XXIX
 MEAN BLOOD HAEMOGLOBIN LEVEL AND CLASSIFICATION OF ANAEMIA

| Sex | Area | BMI Mean \pm SD | Group Compared | 't' value | Classification of anaemia (% subjects) | | | |
|--------|-----------------------|----------------------|-------------------|--------------|---|---------------------------|------------------------------|-------------------|
| | | | | | Normal >13 g/dl | Mild >10 to 13 g/dl | Moderate >10 to 7 g/dl | Severe >7 g/dl |
| Male | Rural(RM) (No.92) | 8.3 \pm 2.01 | RM Vs UM | 7.04* | 1.0 | 26.1 | 39.1 | 34.8 |
| | Urban(UM) (No.118) | 10.8 \pm 0.93 | | | - | 87.3 | 12.7 | - |
| Female | Rural(RF) (No.208) | 7.1 \pm 3.65 | RF Vs UF | 6.38* | - | 7.2 | 28.8 | 63.9 |
| | Urban(UF) (No.182) | 10.0 \pm 0.55 | | | - | 42.3 | 57.7 | - |

* Significant at five per cent level

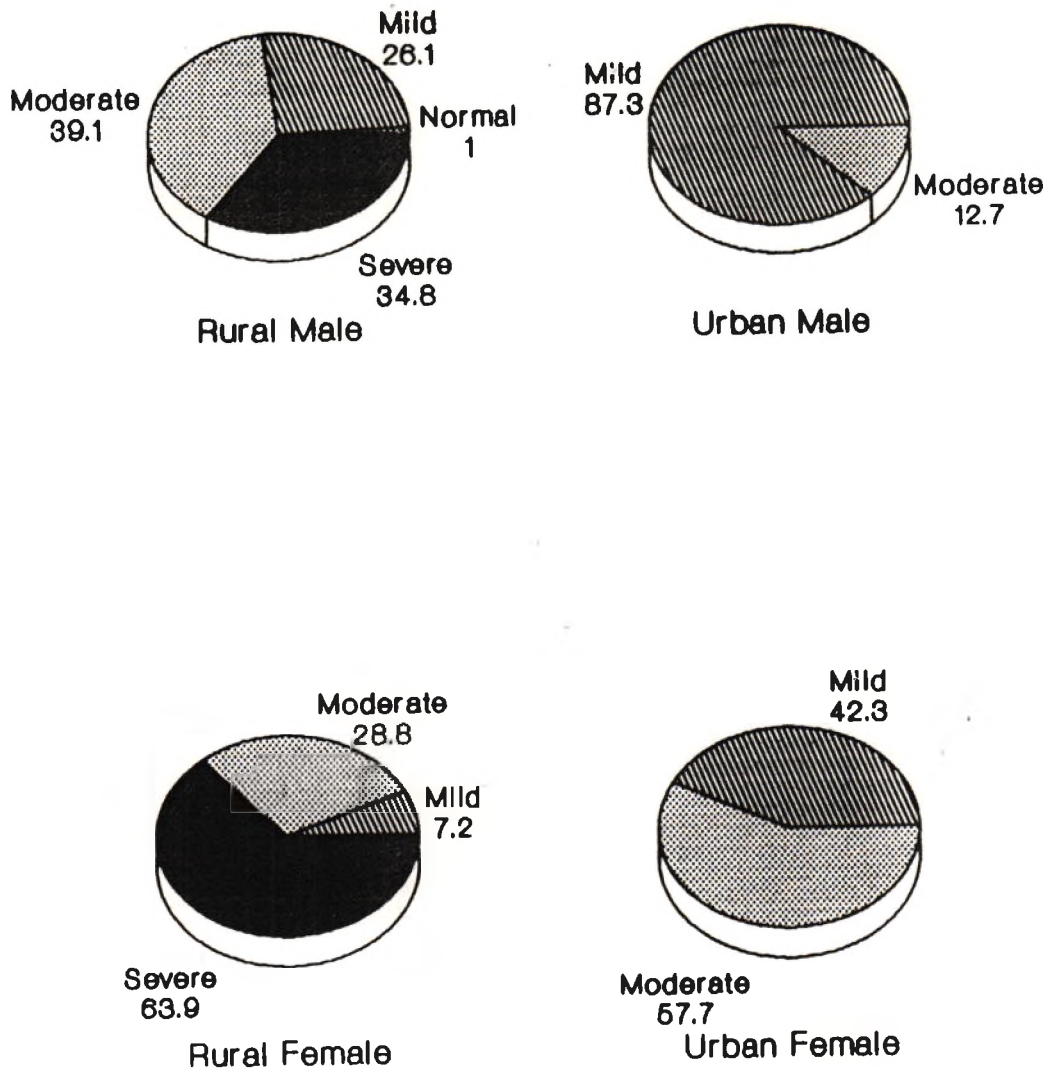


Fig. 12. A
CLASSIFICATION OF ANEMIA

The mean blood haemoglobin level of the rural and urban male subjects were found to be 8.3 and 10.8 g/100 ml respectively while that of the female subjects in rural and urban areas were found to be 7.1 and 10.0 g respectively. When compared with the WHO (1992) suggested normal level of 13 g/100 ml all the subjects were found to be suffering from different grades of anaemia. The rural male as well as female groups recorded lower values of haemoglobin when compared against their urban counterparts and the differences were found to be statistically significant ($P < 0.05$). Gambert (1983) records that 30 to 50 per cent of the elderly men and 70 to 100 per cent of elderly women have less than 10 g of haemoglobin/100 ml.

It could be recalled that the intake of iron among all the subjects in the study was highly deficient and the females had more deficiency of iron (-28%) than the males (-25%). The blood picture also followed the same pattern recorded for the rural and urban subjects i.e., the deficiency being more in the rural areas than the urban areas.

When the subjects were graded according to the severity of anaemia it was found out that except one per cent of the rural male almost all the subjects suffered from different grades of anaemia. The prevalence of the mild, moderate and

severe forms of anaemia among the rural male subjects was found to be 26.1, 39.1 and 34.8 per cent respectively and among the females it was 7.2, 28.8 and 63.9 per cent respectively. According to Krishnaswamy (1986) and Aspirin (1988) anaemia is more prevalent among the lower socio-economic groups.

In the urban areas severe form of anaemia i.e., less than 7 g per 100 ml was not present while 87.3 per cent and 12.7 per cent of mild and moderate cases of anaemia was identified among the urban males. The prevalence of mild and moderate cases of anaemia among the urban females was found to be 42.3 and 57.7 per cent respectively. Bradt (1984) states that anaemia is common in females than males after the age of 60 years.

The results obtained through blood analysis seemed to coincide well with the picture recorded through the clinical examination. It was quite possible that only moderate and severe cases were identified through clinical assessment. The prevalence rates recorded through clinical examination were 89.3 and 62.7 per cent respectively for the rural and urban population and 66.7, 80.0 per cent for males and females respectively.

3. Blood Pressure

Tables XXX, XXXI and Figure 13 present the blood pressure recorded by 600 subjects and grading of the subjects according to the severity of hyper tension.

TABLE - XXX

BLOOD PRESSURE MEASUREMENT OF THE SELECTED RESPONDENTS

| Blood Pressure | Sex | Area | Mean | \pm SD | Groups Compared | 't' value |
|----------------------------|--------|----------------|------|-------------|-----------------|-----------|
| Systolic pressure (mm Hg) | Male | Rural (No.92) | 176 | \pm 24.50 | RM Vs UM | 6.62** |
| | | Urban (No.118) | 141 | \pm 20.69 | | |
| | Female | Rural (No.208) | 174 | \pm 20.21 | RF Vs UF | 2.01* |
| | | Urban (No.182) | 150 | \pm 24.41 | | |
| Diastolic pressure (mm Hg) | Male | Rural (No.92) | 97 | \pm 9.33 | RM Vs UM | 3.97* |
| | | Urban (No.118) | 87 | \pm 10.81 | | |
| | Female | Rural (No.208) | 94 | \pm 11.61 | RF Vs UF | 5.29* |
| | | Urban (No.182) | 85 | \pm 10.71 | | |

* - Significant at five per cent level

** - Significant at one per cent level

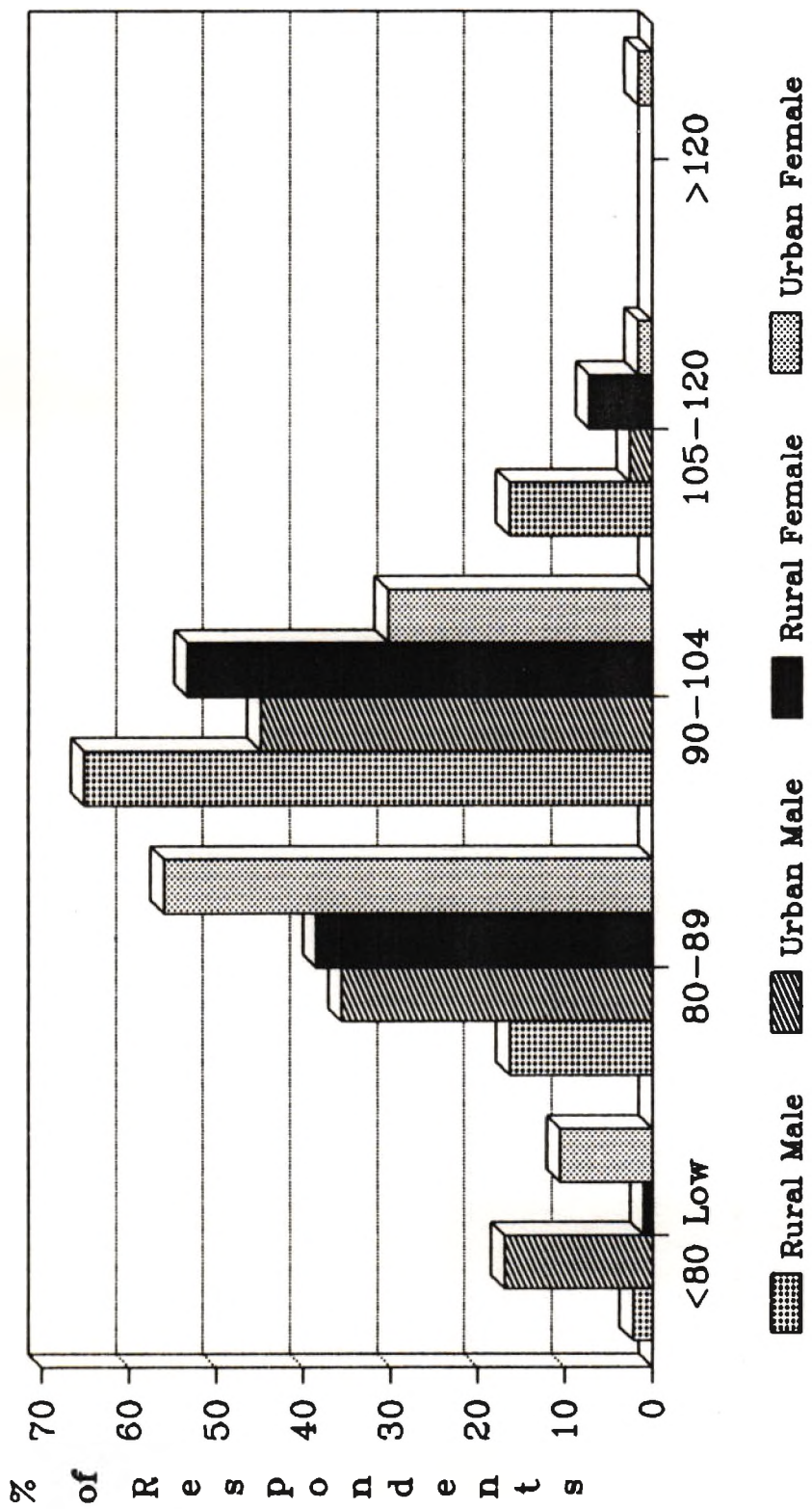


Fig. 13.
 CLASSIFICATION OF HYPERTENSION AMONG
 THE AGED

TABLE - XXXI
HYPERTENSION PRESENT AMONG THE SUBJECTS

| Criteria | Percentage of respondents | | | |
|--------------------------------|---------------------------|-----------------|-----------------|-----------------|
| | Male | | Female | |
| | Rural No.92 | Urban No.118 | Rural No.208 | Urban No.183 |
| Diastolic pressure (mm Hg.) | | | | |
| < 80 (Low pressure) | 2.2 | 16.9 | 1.0 | 10.5 |
| 80-89 (Normal) | 16.3 | 35.6 | 38.5 | 56.0 |
| 90-104 (Mild) | 65.2 | 44.9 | 53.3 | 30.3 |
| 105-120 (Moderate) | 16.3 | 2.5 | 7.2 | 1.6 |
| > 120 (Severe) | - | - | - | 1.6 |
| Systolic pressure (mm Hg.) | | | | |
| Above 150 | 84.8 | 44.9 | 77.9 | 16.5 |

It was found out that the mean systolic pressure recorded for the rural and urban males were 176 and 141 mm Hg. respectively and the diastolic pressure recorded were 97 and 87 mm Hg. respectively. For the rural and urban female groups the mean systolic pressure was 174 and 150 mm Hg. respectively and the diastolic pressure was 94 and 85 mm Hg. respectively. In both the sexes the rural subjects recorded a significantly greater systolic and diastolic pressure than the urban subjects.

Except 16.3 and 35.6 per cent of the rural and urban males and 38.5 and 56.0 per cent of rural and urban females all the other aged subjects were suffering from different degrees of hypertension or low blood pressure. When the systolic pressure was considered 84.8 and 77.9 per cent of the rural male and female subjects and 44.9 and 16.5 per cent of the urban male and female subjects were having a pressure above 150 mm Hg. In general lesser number of the urban population were suffering from hypertension when compared to the rural population and lesser number of the females had hypertension than the male group. It was also found out that more number of urban males and females (16.9 and 10.5%) were suffering from low blood pressure when compared to 2.2 per cent of rural males and 1.0 per cent of rural females. The prevalence trend observed in this study followed the same pattern of results explained in the earlier tables. The higher prevalence of hypertension in the rural area might be due to a higher intake of salt by the subjects and more prevalence of illiteracy. Mansharamani and Gupta (1988) state that in India around 6.5 per cent of the population of 60 years age is suffering from hypertension. In young adulthood and early middle age, high blood pressure prevalence is greater for men than in women (Roccella et al., 1989).

F. ACTIVITIES PERFORMED BY THE AGED

a. Mobility of the Aged

Table XXXII presents the mobility of the 600 aged subjects studied in this investigation.

TABLE - XXXII

MOBILITY OF THE AGED

Percentage of respondents

| Extent of physical mobility | Percentage of respondents | | | | | | |
|---------------------------------|---------------------------|-------------|------------------|---------------------|------------------|-----------------------|--|
| | Area | Sex | Age in years | Education | Occupation | Income in Rs | |
| | Rural Urban | Male Female | 60-69 70-79 80 + | Illiterate Literate | NGE SE EP | <1000 1001-2000 >2000 | |
| | N=300 N=300 | N=210 N=390 | N=361 N=172 N=67 | N=315 N=285 | N=389 N=84 N=127 | N=362 N=109 N=129 | |
| Move freely outside | 85.0 90.0 | 91.9 85.1 | 99.2 97.1 - | 86.3 88.8 | 70.1 75.0 94.9 | 88.4 83.5 88.4 | |
| Move in the neighbourhood alone | 3.0 2.0 | 2.4 2.6 | 0.8 2.9 10.4 | 8.3 5.6 | 26.6 17.9 5.1 | 6.6 8.3 7.0 | |
| Move in the house alone | 11.0 7.0 | 4.8 11.3 | - - 80.6 | 2.5 2.4 | 1.7 7.1 - | 2.2 6.4 3.4 | |
| Bed ridden | 1.0 1.0 | 1.0 1.0 | - - 9.0 | 2.9 3.2 | 1.6 0.0 - | 2.8 1.8 1.2 | |

* NGE - Not Gainfully Employed
 SE - Self Employed
 EP - Employed Privately

The mobility of the subjects was categorised into four groups namely move freely outside, move in the neighbourhood alone, move within the home alone and bedridden. On the whole the subjects who were bedridden were very minimum, that is, below five per cent. The majority of the subjects were able to move freely followed by moving in the neighbourhood alone. More of the urban subjects, male members, younger age group, not gainfully employed individuals and those belonging to the middle income group were able to move outside freely than their counterparts. Rural members, female aged, population above 80+ years age, those who were illiterate, and group with the income of Rs.1001-2000 per month were mostly confined to their house when compared against their counterparts. However it was concluded that except a small percentage, all the members were apparently healthy and moving around freely. Kumaraswamy (1991) reports that families in India have become less involved in the case of the elderly and their poor social-mobility leave socially isolated.

2. Work Preferred by the Aged

Table XXXIII provides information on the work preferred by the aged respondents towards improving their economic conditions.

TABLE - XXXIII
TYPE OF WORK PREFERRED BY THE AGED

| Type of work | Rural | | Urban | |
|---------------------|---------------|------------------|----------------|------------------|
| | Male No=92 | Female No=208 | Male No=118 | Female No=182 |
| Sedentary | 7.3 | 5.3 | 30.6 | 12.5 |
| Moderate | 29.0 | 47.3 | 12.9 | 6.7 |
| Heavy work | 6.0 | 4.0 | 4.3 | 5.8 |
| Any type of work | 4.0 | 3.3 | 5.4 | 2.4 |
| Not willing to work | 53.7 | 40.1 | 46.8 | 72.6 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |

The majority of the aged in the rural areas (29% male and 47.3% female) were willing to undertake moderate type of work while the majority in the urban areas (30.6% males and 12.5% females) were preferring to perform sedentary type of activities. Very limited number of respondents in both the rural and urban areas (< 6.0%) were willing to undertake any type of work or heavy work. It was found out that 53.7 per cent and 40.1 per cent of rural male and female subjects and 46.8 per cent of males and 72.6 per cent of females in the urban areas were not ready to do any work. The desire to work was largely linked with the income level and the need felt for additional financial resources. A large proportion of the aged from rural and urban areas had either no income

or a very poor income and hence, a sizable proportion of respondents expressed the desire to have additional income for themselves. These findings indicate that old people do not want to be dependent on their families and societies for their upkeep.

This finding is in line with the results of a study conducted by Goyal (1992). Nayar (1989) states that in India, a large percentage of the 60+ are economically active because the majority of them are involved in traditional agricultural occupations where there is no retirement age.

3. Participation in Household Activities

Table XXXIV presents the various household activities performed by the aged subjects irrespective of their employment.

TABLE - XXXIV
 PARTICIPATION IN HOUSEHOLD ACTIVITIES BY THE SUBJECTS No. STUDIED : 300 PER GROUP

| Activities | Percentage of respondents | | | | | | | | | | | | | | |
|---|---------------------------|-------|--------------|-------|------|------------|------------|-------|------|--------|-------|-----------|-------|------|------|
| | Area | Sex | Age in years | | | Education | Occupation | | | Income | | | | | |
| | Rural | Male | 60-69 | 70-79 | 80 + | Illiterate | Literate | NGE | SE | EP | <1000 | 1001-2000 | >2000 | | |
| | N=300 | N=390 | N=361 | N=172 | N=67 | N=315 | N=285 | N=389 | N=84 | N=127 | N=362 | N=109 | N=129 | | |
| Purchasing the provisions vegetables etc., | 41.3 | 55.0 | 58.6 | 41.8 | 58.2 | 50.7 | 35.5 | 42.2 | 53.7 | 43.2 | 90.5 | 30.1 | 45.0 | 42.2 | 59.7 |
| Looking after grand children | 37.0 | 44.0 | 11.0 | 12.3 | 11.6 | 10.5 | 16.4 | 13.0 | 10.5 | 14.1 | 16.7 | 1.6 | 14.4 | 18.3 | 11.6 |
| Helping in the kitchen | 38.7 | 47.7 | 5.7 | 15.1 | 12.2 | 13.4 | 10.5 | 13.7 | 9.8 | 12.9 | 19.0 | 3.9 | 12.7 | 18.3 | 10.1 |
| Gardening | 12.0 | 8.7 | 3.8 | 3.3 | 3.0 | 1.7 | 1.5 | 2.9 | 3.2 | 1.8 | 6.0 | 2.4 | 1.7 | 2.8 | 3.9 |
| Others | 5.7 | 1.3 | 1.0 | 0.8 | 1.5 | 1.2 | 0.6 | 1.3 | 0.4 | 1.0 | 1.2 | - | 1.1 | 0.9 | - |

* NGE - Not Gainfully Employed
 SE - Self Employed
 EP - Employed Privately

The aged subjects participated in activities such as purchasing the provisions looking after grand children, helping in the kitchen work, gardening and other minor activities such as repairs and maintenance work. More of the urban subjects were found to be helping in the purchases and looking after the children, whereas gardening and other activities were performed by more of the rural aged. It was clear that the hard physical work was possible by more number of rural aged than the urban aged persons.

It was found out that more number of male subjects (58.6%) did the purchasing of provisions when compared to female subjects (41.8%). At the same time more female members were involved in looking after the grand children and helping in kitchen activities. As the age advanced the involvement in all kinds of household activities decreased. However, they helped the family members by looking after the grand children.

Ranade (1993) recorded that according to 42nd round of the National Sample Survey (NSS) labour market participation is much less common among the aged women (only 5%) and economic independence is present only with 14 to 17 per cent of women aged 60-64 in rural/urban areas and only three per cent of those aged 70 or more. Around 52 to 61 per cent of the women aged 60-64 in rural/urban areas (26 to 30 per cent of those aged 70+) were busy at domestic chores.

More of the literate members (53.7%) did purchasing of the provisions when compared to the illiterate subjects (42.2%). However, the illiterate subjects participated more in activities such as helping in the kitchen and looking after the grand children. In every activity more number of self employed subjects were found to participate when compared to the other two groups.

Income level of the families did not seem to play any specific role in the participation of household activities by the subjects. It was concluded that the aged individuals participated in various household activities. The type of participation varied according to their location, sex and literacy level.

4. Leisure Time Activities

Table XXXV presents the leisure time activities of the aged respondents.

TABLE - XXXV

LEISURE TIME ACTIVITIES OF THE SUBJECTS

| Leisure time Activities | Percentage of respondents | | | | | | | | | | | | | | |
|--------------------------------------|---------------------------|-------------|------------------|---------------------|------------|-----------------|-------|------|-------|-------|-------|------|------|------|------|
| | Area | Sex | Age in years | Education | Occupation | Income in Rs | EP | SE | EP | >2000 | | | | | |
| | Rural Urban | Male Female | 60-69 70-79 80 + | Illiterate Literate | MGE | <1000 1001-2000 | N=127 | N=84 | N=362 | N=109 | N=129 | | | | |
| | N=300 | N=210 N=390 | N=361 N=172 N=67 | N=315 N=285 | N=389 | N=109 | | | | | | | | | |
| Do nothing | 39.3 | 32.3 | 31.0 | 38.4 | 28.8 | 39.0 | 50.7 | 46.3 | 24.2 | 41.7 | 61.9 | 9.4 | 44.2 | 29.4 | 18.6 |
| Reading/listening religious books | 9.7 | 25.3 | 30.5 | 10.5 | 22.2 | 8.7 | 14.9 | 2.5 | 34.0 | 14.9 | 23.8 | 5.5 | 8.8 | 22.9 | 38.0 |
| Reading magazines | 8.3 | 20.0 | 25.2 | 8.2 | 17.2 | 8.7 | 11.9 | 0 | 28.1 | 13.6 | 26.2 | 7.9 | 6.9 | 20.2 | 27.9 |
| Watching movies | 21.7 | 26.0 | 27.6 | 21.8 | 27.7 | 15.7 | 23.9 | 21.0 | 27.0 | 25.2 | 42.9 | 7.1 | 20.7 | 22.9 | 33.3 |
| Listening to radio | 26.0 | 36.7 | 35.7 | 29.0 | 36.6 | 19.2 | 9.0 | 25.4 | 37.9 | 33.7 | 51.2 | 11.0 | 25.7 | 37.6 | 41.9 |
| Morning/Evening walk/exercise | 3.3 | 13.0 | 15.2 | 4.4 | 10.0 | 4.1 | 9.0 | 2.5 | 14.4 | 9.0 | 9.5 | 4.7 | 3.3 | 13.8 | 17.1 |
| Playing cards and other indoor games | 1.0 | 0.3 | 0.8 | 0.5 | 1.1 | 0 | 0 | 1.0 | 0.4 | 0.8 | 1.2 | 0 | 0.8 | 0 | 0.8 |
| Visit to friends/relatives | 11.6 | 30.7 | 25.2 | 19.0 | 24.7 | 16.3 | 14.9 | 16.2 | 26.7 | 22.4 | 44.0 | 9.4 | 18.0 | 26.6 | 25.6 |
| Help others | 7.0 | 2.3 | 19.0 | 12.1 | 12.2 | 15.7 | 20.9 | 1.6 | 28.1 | 14.9 | 23.8 | 5.5 | 11.9 | 27.5 | 9.3 |
| Visiting to places of worship | 10.7 | 30.7 | 15.2 | 16.4 | 19.7 | 11.0 | 9.0 | 11.4 | 21.4 | 16.2 | 23.8 | 10.2 | 11.9 | 20.2 | 24.0 |

* MGE - Not Gainfully Employed

SE - Self Employed

EP - Employed Privately

Various types of activities such as reading, watching movies, walking, playing cards and making visits were undertaken by the subjects studied. Except around 12 per cent of the total subjects, all the others were engaged, in some type of activity or other during their leisure time. Except reading activity and helping others all the other activities were performed less by the urban members than the rural members. Reading activity was more in the urban area mainly due to the increased literacy level among the urban population as observed in the previous table. The availability of literate and library facilities also would have helped the urban members to read more. The results also indicated that the rural members had an increased tendency to help others than the urban subjects.

It was interesting to observe that the aged male members participated in all the activities more than the female members, except in the case of visiting the places of worship. It was observed that as the age increased the percentage of the people not performing any activity increased and at the same time the tendency to help others was observed more among the older age group. As the age increased the habits of listening to radio, visiting to friends as well as going to places of worship and engaging in indoor games were found to decrease. Except playing cards and sitting idly without doing any activity all the other

activities were performed by the literate subjects more than the illiterate members.

When the impact of the occupation on the leisure time activity performed by the aged members was considered, the self employed members were found to perform all the various types of activities in larger number followed by the not gainfully employed individuals and the least bit of interest in activities was evinced by the employed group. When the income level of the families increased the number doing nothing decreased and at the same time the percentage of the subjects involved in various activities increased with the increase in family income. Only in the case helping others, the least proportion of the members (9.3%) in the highest income group were having the habit of helping others followed by the group with less than Rs.1000 as family income (11.9%) and the group with the income of Rs.1001-2000 per month (27.5%).

G. SOCIAL AND PSYCHOLOGICAL PROBLEMS OF THE AGED

1. Social Problems of the Aged

Table XXXVI and Figure 14 present the social problems faced by the elderly subjects in the study.

TABLE - XXXVI

SOCIAL PROBLEMS OF THE SELECTED SUBJECTS

| Problems | Percentage of respondents | | | | | | | | | | | | | | |
|--|---------------------------|-------|--------------|--------|-----------|-------|------------|------------|--------------|-------|------|-------|-------|-----------|-------|
| | Area | Sex | Age in years | | Education | | Occupation | | Income in Rs | | | | | | |
| | Rural | Urban | Male | Female | 60-69 | 70-79 | 80 + | Illiterate | Literate | NGE | SE | EP | <1000 | 1001-2000 | >2000 |
| | N=300 | N=300 | N=210 | N=390 | N=361 | N=172 | N=67 | N=315 | N=285 | N=389 | N=84 | N=127 | N=362 | N=109 | N=129 |
| Not respected by the family members | 6.0 | 3.0 | 3.3 | 5.1 | 3.6 | 4.1 | 10.4 | 5.4 | 3.5 | 4.8 | 11.9 | 1.6 | 5.5 | 2.8 | 3.1 |
| Not involved in decision making | 24.7 | 29.7 | 18.1 | 31.8 | 19.1 | 26.7 | 70.1 | 34.9 | 18.6 | 32.6 | 40.5 | 1.6 | 10.2 | 27.5 | 74.4 |
| Not invited for family functions | 13.3 | 16.0 | 10.5 | 16.9 | 8.3 | 18.0 | 40.3 | 19.0 | 9.8 | 17.0 | 14.3 | 7.9 | 3.6 | 8.3 | 51.2 |
| Not discussing family matters | 26.0 | 28.7 | 17.6 | 32.3 | 19.4 | 28.5 | 67.2 | 35.9 | 17.9 | 33.4 | 36.9 | 2.4 | 4.3 | 21.1 | 88.4 |
| Feeling insecure | 36.3 | 15.0 | 20.0 | 28.5 | 21.6 | 26.7 | 56.7 | 30.5 | 20.4 | 30.3 | 32.1 | 7.1 | 6.4 | 22.9 | 82.2 |
| Not recognised by the society | 72.3 | 91.0 | 40.4 | 47.7 | 39.5 | 42.7 | 76.1 | 48.6 | 42.1 | 48.3 | 71.4 | 19.7 | 13.4 | 88.1 | 96.9 |
| Not visited by the friends and relatives | 35.3 | 56.0 | 18.1 | 25.9 | 16.9 | 25.0 | 52.2 | 27.3 | 18.6 | 7.7 | 31.0 | 3.9 | 6.7 | 8.3 | 68.2 |
| Being a burden to the society | 85.7 | 95.7 | 93.8 | 87.4 | 86.1 | 98.8 | 91.0 | 89.8 | 90.9 | 87.9 | 70.2 | 32.3 | 88.9 | 59.6 | 78.3 |
| Mean No. of problems/head | 3.0 | 3.3 | 2.3 | 2.7 | 2.2 | 2.8 | 3.9 | 2.9 | 2.2 | 2.6 | 3.1 | 0.8 | 1.4 | 2.4 | 5.4 |

* NGE - Not Gainfully Employed

SE - Self Employed

EP - Employed Privately

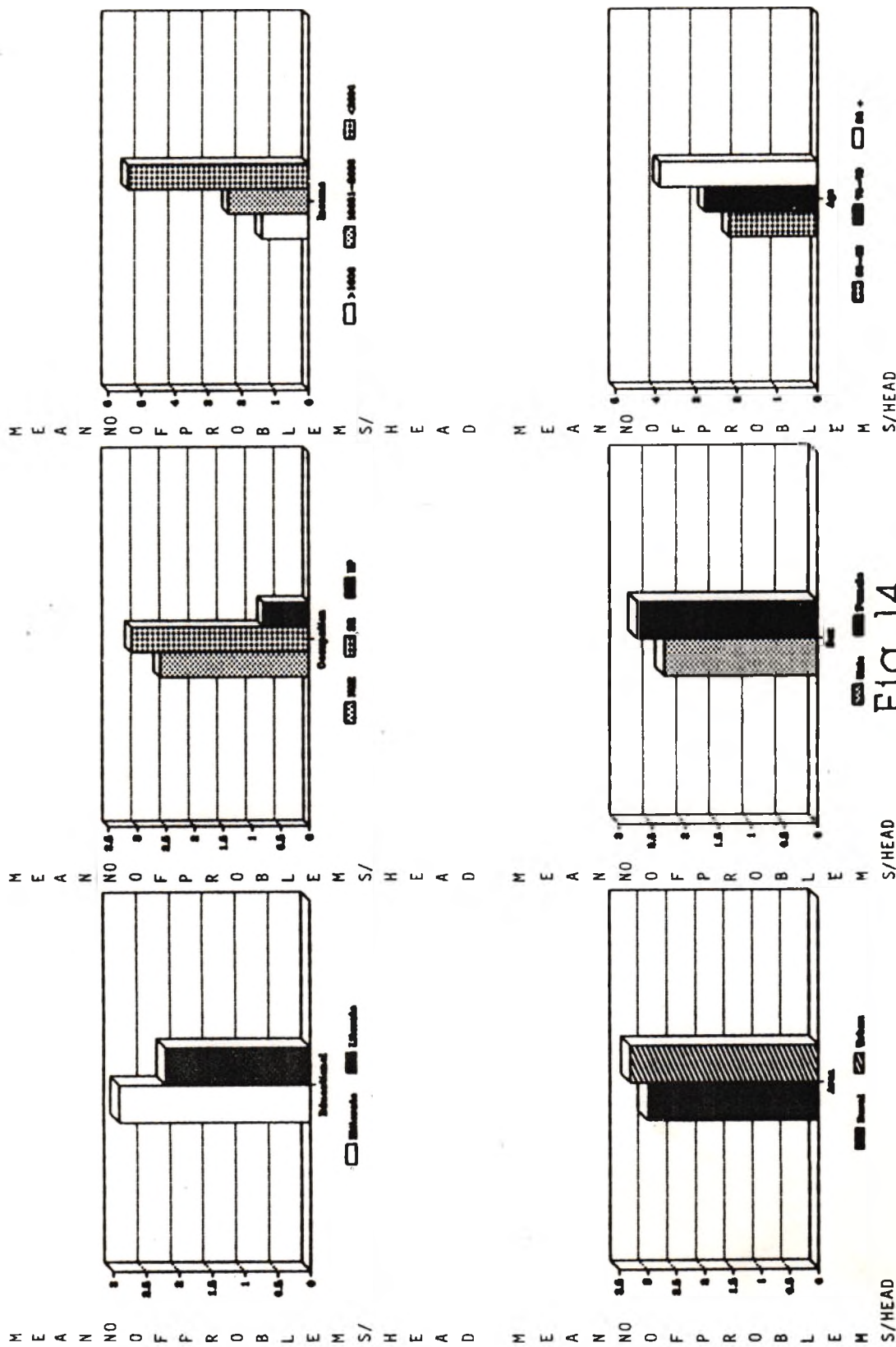


Fig. 14. SOCIAL PROBLEMS OF THE SUBJECTS

The elderly members seemed to suffer from several social problems arising within the family as well as outside the family. In general, the subjects expressed that they were not respected by the family members. They were not consulted regarding the family matters and decision making. They were not cordially invited for family functions by the relatives and there was a feeling of insecurity among the aged members. Kushal Kaushik (1991) report that when the aged people are financially and physically dependent on the younger generation they tend to ignore the advice of the elderly people. As far as their position in the society was considered, many felt that they were not recognised by the society, they were not visited by friends or relatives and both in the rural and the urban areas the maximum number of subjects (85.7% and 97.5% respectively) felt that they remained as a burden to the society.

A sort of insecurity was felt more in the rural areas (36.3%) when compared to the urban subjects (15%). When the number of social problems experienced by the individuals was considered, the urban members had a slightly more number of problems (mean 3.3) when compared to the rural aged (mean 3.0).

The sex wise comparison indicated that the female subjects faced more social problems than the male subjects

(female 2.7 and male 2.3). Apart from being a burden to the society a large number of males and females expressed that they were not adequately recognised by the society. In both the areas a higher percentage of the males were consulted regarding family problems than the females. This also showed that the females were not given due recognition in decision making in the families. Nair (1989) observed that in the rural areas of Karnataka the condition of females was extremely worse especially if the females were widows.

As the age of the subjects increased the number of problems faced by the subjects also increased. This trend was the same in every individual problem of the elderly. The mean number of problems among aged groups namely 60-69 years, 70-79 years and 80+ years were found to be 2.2, 2.8 and 3.9 respectively. This must be due to the reason that as the age increased they become more immobile and confined to their house and also because of the loss of memory and reasoning. The younger family members avoided consulting the family matters with the aged.

As observed before, in the case of social problems also the illiterate members faced more problems than the literate. The literate naturally received more recognition in the society and senior literate citizens were invited to be the members in village committees, temple management,

organising committee, village panchayat, and they participated in the village meetings and at the same time family members also consulted the aged literate members regarding the family matters.

Among the three different occupation groups, the employed members had experienced lesser social problems followed by not gainfully employed and self employed members. This might be due to the reason that the employed members belonged to younger age group when compared to the other two categories and lesser the age, lesser was the feeling of being a burden to the society and least was the feeling of insecurity.

It was interesting to find out that as the income level of the family increased the members became more sensitive to the family issues and the social problems and as a result maximum number of social problems were recorded among the members in the higher income group (mean 5.4) followed by the middle income group (mean 2.4) and the members in the low income families (mean 1.4).

2. Psychological Problems

Table XXXVII presents the psychological problems faced by the aged respondents.

TABLE - XXXVII
PSYCHOLOGICAL PROBLEMS

| (No. 300 per group) | | | |
|---------------------|---|--------------|--------------|
| S.No. | Problems | Rural (%) | Urban (%) |
| 1. | Depressed mood | 52.0 | 12.7 |
| 2. | Loss of memory | 46.0 | 25.3 |
| 3. | Fear | 12.0 | 6.0 |
| 4. | Feeling of unwantedness and hatredness towards life | 2.0 | 1.5 |

The common problems expressed by the aged were depression and loss of memory. More number of rural subjects (52% and 46% respectively) were suffering from these problems when compared to urban members (12.7% and 25.3% respectively). Around 12 per cent of the rural and six per cent of the urban had an unexplainable fear about the future and two per cent of the rural and 1.5 per cent of the urban were suffering from the feeling of negligence and hatredness towards life. Horrison et al. (1990) reported a high prevalence of depression among elderly group. Geriatric depression is most frequent with a prevalence rate of 60/1000 (Horrison et al., 1990 and ICMR, 1991).

On discussion with the subjects the investigator noted that there was no specific causative factor for the

prevalence of depressed feelings among the aged. It was mainly the result of a mixture of economic, physiological and social problems faced.

From the foregoing discussion, it could be concluded that the factors namely sex, age, area of living, income level and occupation have an influence on the overall physical, mental and psychological well being of the aged. The urban aged are in an advantageous position than the rural aged with better health care facilities and less monotony in life. Employment opportunities, income and literacy status provide the aged the much needed feeling of security. Efforts are to be undertaken to elevate the status of women as they are far behind men with low income, low literacy level and more of physiological and nutritional problems.

Summary and Conclusion

V. SUMMARY AND CONCLUSIONS

The present investigation entitled "Nutritional profile and problems of old age" was carried out in Dindigul Anna District of Tamil Nadu. Old age is perhaps the most vulnerable period of life after infancy. Growing old is an universal phenomenon and it is a continuation of life with decreased capacity for adaptation. It is accompanied by varied changes which impose a number of personal, social, economic, health and psychological problems. This study is an attempt to assess the nutritional status and to explore the socio-economic, health and psychological problems of the aged.

The data for the study was collected from a group of 600 subjects in the age of 60+ years and above residing in rural (No.300) and urban (No.300) areas.

Among the 600 respondents selected for the study around 60.2 per cent were in the age group of 60-69 years, 28.7 per cent were in the age group of 70-79 years and 11.2 per cent were in the age group of above 80 years.

The investigation consisted of carrying out a detailed survey to collect information on the socio-economic background, diet pattern followed, nutrition knowledge and health and psychological problems faced by the entire group.

Anthropometric measurements namely height and weight and blood hemoglobin level were determined for the whole group. A sub sample of 50 per cent were drawn from each area (150 rural and 150 urban) and a clinical assessment was carried out. A sub sample of 30 rural and 30 urban subjects (15 males and 15 females in each group), in the age group of 60-69 years doing sedentary work were studied for their diet intake through a three day food weighment survey.

The results of the study revealed the following:

1. Marital Status

More than 50 per cent of the respondents were living with their spouse in both the areas (51% rural and 59% urban). The incidence of widowhood was found to be higher among females (61.5%) than among the males (8.6%). As the age increased, the percentage of widows/widowers increased (36.3% in the age group 60-69 years and 56.7% in the 80+ age group). The number of respondents living with the spouse was more among the literate group (73.0%) than among the illiterate group (39.7%) As the level of family income increased the number of widows/widowers decreased.

2. Living Status

The majority (45%) of the respondents in the rural and the urban areas were living with their unmarried children, 12 per cent with married children and 26 per cent with their

spouse in rural areas as against 35 per cent in urban areas. Around 18 per cent of the subjects were living alone in the rural areas as against eight per cent in urban areas. Among the aged who were literates the percentage of them living with their children was found to be less when compared against the illiterate group.

3. Status of the Aged

More than 40 per cent of the respondents in both the areas were wholly dependent on others for their livelihood and the rest were partially dependent.

Maximum percentage of the males (47.6%) and a minimum percentage of the females (19.5%) were the chief bread winner in their families. Females were economically more dependent on others.

Around 38.6 per cent of the literates and 20.9 per cent of the illiterates were the bread winner in the families. Less number of literates (34%) were dependent on others as against 54 per cent of illiterates. Around 50 per cent of the respondents were either self-employed or employed privately.

Among the three income groups maximum number of aged in the low income group were playing the role of the chief bread winner of the families.

4. Educational Level of the Respondents

About 64.7 per cent of the rural aged and 40 per cent of the urban aged were totally illiterate. At every level of education namely, primary, middle, high school, and college/university level more number of urban population were found to be educated than the rural subjects.

Around 70 per cent of the females and 20 per cent of the males were found to be illiterate and as the age of the subjects increased the prevalence of illiteracy was found to be higher.

The self-employed group had the least number of illiterates. The highest percentage (61.9%) of the subjects were found to be illiterate in the group having the lowest income i.e., below Rs.1000/per month.

5. Occupation

Around 63.7 per cent of the rural respondents and 66 per cent of the urban respondents were not gainfully employed and they took care of the household activities. Self-employed group consisted of 14 per cent of the population and the third group (21%) consisted of privately employed subjects in various concerns or worked as wage earners. Around 20 per cent of the male subjects were self employed as against 10.8 per cent of females. As the age

increased the number of subjects who were not gainfully employed increased. The unemployed found to be more among the illiterate (71.4%), self employed were more (20.4%) among the literates.

6. Income

The monthly per capita income of the respondents ranged from Rs. < 500 to > Rs.3000/-. Majority of the subjects (86.3%) in rural and (67.7%) in urban were getting a per capita income below Rs.500 per month. Females had less income than the males. Literates had higher income than the illiterates. Age did not show any specific trend in the per capita income. Self-employed had more income than those employed outside.

7. Diet Pattern

Majority of the respondents from both the areas were non-vegetarians. The percentage of respondents taking three meals per day was more in the age group of 60-69 years.

Maximum percentage of both the rural (60.3%) and urban (78.7%) subjects preferred hot foods first followed by sweet items and spicy foods. The bland and salt foods were least preferred by the subjects in the study.

More than 70 per cent of the rural and urban subjects had reduced the quantity of foods consumed in their old age.

More number of females (75.6%) had reduced their intake as against males (67.1%) and maximum percentage (86.6%) of the 80+ year group and 100 per cent of the self-employed subjects reduced their food intake. The other changes introduced by the aged in their diet were reduced fibre intake, avoiding spices in the diet, addition or avoiding non-vegetarian foods and reduced salt/sugar intake.

8. Nutrition Knowledge/Practices

The main aspects considered in nutrition knowledge test were meaning of balanced diet, uses of papaya and green leafy vegetables, proper method of cooking foods and awareness of the safe drinking water. The knowledge scores obtained by the females, literates, 60-69 year age group, self employed individuals and high income group subjects were found to be significantly greater than the respective counterparts.

Majority of the aged missed their meals on specific days and festival days for religious reasons. More of females observed fasting than men.

During fever easily digestible foods like porridge, milk, bread etc., were consumed by majority of the subjects. Curd and feenu greek seeds were recommended for diarrhoea. Oily and spicy foods were avoided during illness. Tender

coconut, banana, curd and onion were recommended for chickenpox. Salt was strictly avoided during chickenpox.

Root vegetables, oily foods, and spicy foods were avoided during old age, since those foods were not agreeable to their system.

The main sources of nutrition knowledge obtained by the aged were literature, radio and members like doctors, social workers and friends.

9. Nutritional Problems

Anaemia had been wide spread among the rural subjects (84%) than the urban. and it was higher among females (80%) than males (66.7%). Glossitis was highly prevalent followed by loss of appetite and phrynoderma among females and dry and rough skin and phrynoderma in males. Illiterate members had a higher prevalence of all the deficiencies than the literates. Among the elderly population on the prevalence of nutritional deficiencies was not changing with increasing age.

Around 99 per cent of the low income group subjects were suffering from anaemia. There was a declining trend in the prevalence of problems with the increase in per capita income.

10. Physiological Problems

Majority of the rural respondents were suffering from cataract followed by bad breath. Among the urban the highest number had toothlessness followed by cataract. On an average, 3.7 and 2.7 problems per head were present among the rural and urban groups and 2.6 and 3.5 problems were present among the males and females.

The mean number of physiological problems in the three age groups namely 60-69 years, 70-79 years and 80 and above years were found to be 2.8, 3.9 and 4.2 respectively and among the illiterates and literates the mean number of problems present were 4.0 and 2.3 respectively.

The percentage prevalence of every problem was the highest among the group having an income below Rs.1000 per month.

11. General Health Problems

The problems such as general fatigue, sleeplessness, head ache, body pain and constipation were present more among urban aged while, shortness of breath, chest pain giddiness oedema, burning sensation, numbness and itching were present more among the rural subjects. The mean number of complaints were more among the rural aged (5.2) than the urban aged (4.1). Female subjects and illiterate respondents

were having more of general problems than the male and literate groups.

The subjects who were not involved in gainful employment and remained restfully at home had less number of problems (mean 3.2), when compared to self-employed group (mean 8.2) and those who were privately employed (mean 9.4).

The commonly prevailing diseases among the aged subjects were peptic ulcer, diabetes mellitus, asthma, rheumatism, pyrrhoea and hypertension. Among the rural (28.7%) as well as the urban (15%) aged, hypertension seemed to be the major disease followed by asthma (12.3%) in rural and Pyrrhoea in (21.3%) urban areas. Literate seemed to take care of their health better than the illiterates. The self-employed respondents had the maximum number of diseases than the other two groups. When the family income increased the mean number of diseases suffered by the aged increased. (0.59, 0.62 and 0.65 respectively for three income level).

The females though had more number of deficiency diseases they were not suffering from specific disease condition more than the males. As the age increased the manifestation of diseases were more obvious and severe. With better education it was possible to prevent or control the disease conditions.

12. Social Problems of the Aged

In rural areas the respondents expressed that they were not adequately respected by the family members, not consulted while making decisions on family matters. Both in rural and urban areas the maximum number of subjects (85.7% and 97.5% respectively) felt that they remained as a burden in the society. A feeling of insecurity was more in the rural areas (36.3%) as against the urban subjects (15%). The urban members and female subjects had slightly more number of social problems than their respective counterparts.

When the age increased the number of problems seemed to increase. The mean number of problems among 60-69 years, 70-79 years and 80+ years were 2.2, 2.8 and 3.9 respectively. Illiterate subjects faced more problems than the literates. Privately employed subjects had lesser social problems followed by not gainfully employed and self-employed members.

As the income level of the family increased the members became more sensitive to the family issues and maximum number of problems were recorded among the members in the income above Rs.2000 per month (mean 5.4).

13. Psychological Problems

Higher percentage of rural subjects were suffering from depression (52%) and loss of memory (46%) than the urban

members (12.7% and 25.3% respectively). Around 12 per cent of the rural and 6 per cent of the urban had an unexplainable fear about the future and 2.0 per cent of the rural and 1.5 per cent of the urban were suffering from a feeling of negligence and hatredness towards life.

14. Participation in Household Activities

More of the urban subjects were found to be helping in the purchases and looking after the children, whereas gardening and other tougher activities are performed by more of the rural aged. More number of males (58.6%) and literates (53.7%) helped in purchasing the provisions. Female members were mostly involved in looking after the grand children and helping in the kitchen activities. As the age advanced the involvement in all kinds of household activities decreased.

15. Tobacco Chewing, Smoking and Drinking Habits

A higher percentage of the rural aged (30.7%) had the habit of chewing tobacco and betal leaves than the urban (17.3%). Alcohol drinking, smoking and using snuff were found to be only in a negligible percentage of the subjects both in the rural and urban but they were present more among the illiterates and those, confined to their houses.

16. Leisure Time Activities of the Aged

Except around 12 per cent of the total subjects all the others were engaged in some type of activity or other during their leisure time. Reading habit was present more among the urban respondents and males participated more than the females aged. As the age increased the percentage of people not performing any activity increased and the tendency to help others was observed more among the older age group. More number of literates as well as those with higher income were engaged in all types of leisure activities than their counterparts. Self-employed members were found to perform all types of activities in larger number followed by not gainfully employed individuals.

17. Mean Food Intake of the Subjects

Except the rural males and females in the high income group, urban male and female in the middle income group and urban male in the low income group all the others consumed lower intake of cereals when compared to suggested allowance intake of Pulses was not deficit.

Almost all the groups studied had deficient intake of green leafy vegetables (21.5 g) which varied from 0 to 36 g. The low income group had the meagre intake of green leafy vegetables (6.8 g) than the middle income group (25.9 g) and the high income group (37.1 g).

The consumption of roots and tubers were deficient in low income group subjects. The intake of other vegetables was more among urban areas, males and those belonged to high income group. The intake of fruits and milk among the subjects were satisfactory and the consumption of fats was less. Consumption of sugar among the rural subjects was more than the urban subjects and it was less in the high income group. However the aged subjects in the present study were consuming reasonably adequate diets.

Around 68.3 per cent of the rural and 76.0 per cent of the urban old women fully or partially took up the food preparation responsibility at home and for 29.3 and 23.3 per cent of the rural and urban women food was mainly prepared by others. Out of 600 subjects 77.7 and 91.0 per cent of the rural and urban subjects were not having any complaints about food and the rest were not satisfied with the food consumed because of economic reasons.

18. Mean Nutrient Intake of the Aged

All the subjects in the study met their requirements for energy, thiamine and vitamin C through their home diets. The deficits in protein content were 6.2 and 4.2 per cent respectively in the rural and urban areas. The iron and Beta carotene content of the diet was low among the aged, there was no significant difference in the intake of nutrients among the subjects in rural and urban areas.

Among the high income group except for the intake of fat, calcium and iron, all the other nutrients were found to be deficient. The main factor which influenced the intake in the old age was income of the families.

19. Anthropometric Measurements

The mean height of the rural and urban male subjects was 159.4 cm and 158.8 cm respectively. The mean height of the rural and urban female subjects was 141 and 149 cm respectively. The difference between the rural and urban groups were very low and found to be statistically insignificant. The mean weight of the subjects in the urban areas recorded significantly more ($P < 0.01$) when compared to rural subjects.

The urban populations recorded a significantly greater BMI than their respective rural counterparts. When subjects were graded for obesity based on BMI none of the rural male were found to be obese and 22.9 per cent of the urban males were in Grade I obesity, 1.9 per cent of the females were in Grade II obesity, 3.4 per cent were of females in Grade III obesity. Obesity was prevalent more among urban female subjects with 3.3 per cent in Grade III obesity, 10.4 per cent in Grade II obesity, and 15.4 per cent in Grade I obesity.

20. Blood Hemoglobin Levels

The mean blood hemoglobin level of the rural and urban male subjects were found to be 8.3 and 10.8 g/100 ml respectively. The female subjects in rural and urban areas were found to have 7.1 and 10.0 g, haemoglobin respectively. When the anaemia was graded based on the blood haemoglobin levels suggested by WHO (1992), all the subjects were found to be suffering from different grades of anaemia. The rural subjects recorded lower values of hemoglobin than urban subjects and the differences was found to be statistically significant ($P < 0.05$).

21. Blood Pressure

The mean systolic pressure recorded for the rural and urban males were 176 and 141mm Hg respectively and the diastolic pressure recorded were 97 and 87mm Hg respectively. For the rural and urban female group the mean systolic pressure was 174 and 150mm Hg respectively and the diastolic pressure was 94 and 84mm Hg respectively. In both the sexes the rural subjects recorded a significantly greater systolic and diastolic pressure than the urban subjects.

Except 16.3 and 35.6 per cent of the rural and urban males and 38.5 and 56.0 per cent of the rural and urban females all the other aged subjects were suffering from different degrees of hypertension or low pressure.

When the systolic pressure was considered 84.8 and 77.9 per cent of the rural male and female subjects and 44.9 and 16.5 per cent of the urban male and female subjects were having a pressure above 150 mm Hg.

This investigation has brought to light that the aged members are confronted with various kinds of nutritional, economic, physiologic, social and psychological problems. The rural aged are mostly illiterate with less income and less nutritional awareness. They suffer from more nutritional, physiological and other problems compared against the urban aged. In general, the male members are more literate, economically independent and face less physiological and nutritional problems compared with the female counterparts. When the literacy level, income level and employment status improve they seem to be more comfortable in health condition and living status. In order to bring out total happiness, health and security among the aged the following recommendations should be considered for implementation.

More income generating opportunities suitable for old age must be specially created and operated as an organised system.

For those who suffer from family negligence, but have adequate money to support themselves, suitable old age

homes must be built and availability of such facilities must be made known to all.

Integrated programmes with proper health, nutrition and education components for the aged especially for widows/widowers need to be initiated in the country.

Food and other provisions must be made available to the aged at subsidised rates.

In the rural area free health care facilities should be made available to all the aged for the early detection, prevention and treatment of diseases.

Mobile dispensaries meant for the elderly may be started to help the aged.

In rural as well as urban areas recreation centres should be started for the aged where nutrition/health education, exercise, entertainments, making handicrafts and reading facilities are to be made available.

The current efforts to unearth the geriatric problems in the country are far from satisfactory. In order to bring the above listed recommendations in a phased manner, continuous thrust should be given to this area of research.

Nutritional status of institutionalised individuals, those who live in their families, and those who live alone, need to be studied immediately. Body measurement standards for the old age is not available for Indian subjects. Studies on anthropometric measurements, biochemical profile, food and nutrient requirements for the old age, energy expenditure pattern of the elderly and all the factors affecting the nutritional well being of the aged are urgently needed to fulfil the existing lacunae and build the future welfare programmes for the aged.

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Appendices

APPENDIX I

QUESTIONNAIRE TO ELICIT THE SOCIO - ECONOMIC BACKGROUND
AND NUTRITIONAL, HEALTH AND SOCIAL PROBLEMS OF THE AGED

General Particulars:

- 0.1 Name of the respondent :
- Age :
- Sex : Male/Female
- 0.2 Address of the respondent : Door No:
- Name of Village :
- and Block :
- 0.3 Status :
1. Married
 2. Single
 3. Widow
 4. Widower
 5. Separated
 6. Divorce
- 0.4 Education :
1. Illiterate
 2. Primary
 3. Middle
 4. High School
 5. College/University
 6. Technical

0.7 Types of Occupation :

1. Self-employed
2. Part-time work
3. Full time work
4. Without work
5. Government
6. Private

0.7.1 Occupational Pattern :

1. Manual labour, Managerial, Administration
2. Professional, technical (supervisors), etc.
3. Sales and related
4. Sub-ordinate Technical occupation
5. Service occupation
6. Land - lords

0.8 Status of the aged in the family :

1. Chief bread winner
2. Wholly dependent
3. Partially dependent

0.9 Living style of the aged :

1. Living alone
2. Living with spouse
3. Living with children
4. Living with married daughters (son-in-law)
5. Living with other relatives

1.0 Housing condition of the aged :

1. Living in own house
2. Living in rented house
3. Living in rent free house

1.1 Sources of Income : Aged (Rs) Family (Rs)

1. Salary/wages :

2. Earnings (self-employed) :

3. Receipts from properties :

1. Land :

2. Rental :

4. Income from investment :

5. Pension :

6. Allowance from sons/daughters/others :

7. Total income :

1.1.1 Are you satisfied with your economic condition?

Yes/No :

Reasons :

1.2 Family composition :

Sl. Relationship Age Sex Marital Education Occupation Income
No. with aged status /month

-
- 1.4 Diet pattern : 1. Vegetarian
2. Non-vegetarian
3. Ovo-vegetarian

1.6 Methods of cooking used by the aged

Food Water Water Steaming Frying Others
stuffs absorption strained

1. Cereals
 2. Pulses
 3. Vegetables
 4. Milk
 5. Meat
 6. Egg
-

1.7 What is meant by balanced diet ?

1.8 What are the uses of greens ?

1.9 What are the uses of papaya ?

2.0 Vegetable washed : 1. Before cutting
2. After cutting

Reasons :

Size of cutting : 1. Large
2. Small
3. Medium

Reasons :

2.1 Do you prefer to have drinking water in the form of

: 1. Boiled
: 2. Unboiled
: 3. Filtered

Reasons :

2.2 Foods considered nutritions by the subject :

| Foodstuffs | Yes | No |
|----------------------|-----|----|
| 1. Greens | | |
| 2. Egg | | |
| 3. Dhall | | |
| 4. Fish | | |
| 5. Milk | | |
| 6. Flesh foods | | |
| 7. Ragi | | |
| 8. Groundnuts | | |
| 9. Papaya | | |
| 10. Others (specify) | | |

2.3 Source of knowledge : 1. Literature
2. T.V.
3. Radio
4. Others

2.4 Are you preparing your own meals ? Yes/No

2.5 If 'Yes', specify the assistance you receive

1. Self cooking
2. Help given by the relatives
3. Neighbours help

2.6 If ' No ', Who provides your food ?

1. Son
2. Daughters
3. friends
4. Neighbours
5. Hotel
6. Free meal centre
7. Others

2.7 How will you preserve the foods ?

2.8 Are you satisfied with the food ? Yes/No

2.8.1 If ' Yes ', specify the reasons.

2.8.2 If ' No ', specify the reasons.

2.9 Do you need any help while taking food? Yes/No

3.0 If 'Yes', specify the reasons

3.0.1 If 'No', Specify the reasons

3.0.3 Specify the number of meals you take in a day ?

1. Once
2. Twice
3. Thrice
4. Others

3.1 Do You eat along with your family members ? Yes/No

3.1.1 Specify the reasons.

3.2 What are the changes you have made in your diet pattern after 60 Years.

| Changes Introduced | Reasons |
|------------------------|---------|
| 1. Quantity decreased | |
| 2. Fibre free | |
| 3. No spice | |
| 4. Addition of non-veg | |
| 5. Avoiding non-veg | |
| 6. Salt free | |
| 7. Sugar free | |

3.3 Foods included and avoided in the diet ?

| Foods included in the diet | Reasons | Food avoided in the diet | Reasons |
|----------------------------|---------|--------------------------|---------|
|----------------------------|---------|--------------------------|---------|

3.4 Taste of food liked by the aged

| Taste | Preference | Reasons |
|--------|------------|---------|
| Sweet | | |
| Salt | | |
| Hot | | |
| Spicy | | |
| Bland | | |
| Others | | |

3.5 Do you take any special care while preparing your food? (for example : Salt free)

| Care given | Reasons |
|-------------------|---------|
| 1. Double boiling | |
| 2. No spice | |
| 3. Salt free | |
| 4. Sugar free | |
| 5. Others | |

3.6 Three day meal pattern :

| Days | Breakfast | Mid morning | Lunch | Tea | Dinner |
|---------|-----------|-------------|-------|-----|--------|
| I day | | | | | |
| II day | | | | | |
| III day | | | | | |

4.0 Do you observe fasting ?

Yes/No

If 'Yes',

| Meals Missed | How- Long | Type of food consumed | Reasons/ Advantages | Frequency |
|-----------------|--------------|--------------------------|------------------------|-----------|
|-----------------|--------------|--------------------------|------------------------|-----------|

4.1 Specify the foods included and avoided during illness.

| S.No. | Diseases | Foods included | Reasons | Foods avoided | Reasons |
|-------|----------|-------------------|---------|------------------|---------|
|-------|----------|-------------------|---------|------------------|---------|

1. Fever
 2. Diarrhoea
 3. Cold
 4. Indigestion
 5. Asthma
 6. Ulcer
 7. Hypertension
 8. Heartbuns
 9. Piles
 10. Jaundice
-

4.2 Health Care of the Elderly :

Personal Care :

| Activities | Performed | | Reasons |
|-----------------|-----------|--------------|---------|
| | With help | Without help | |
| Eating | | | |
| Walking | | | |
| Taking medicine | | | |
| Bathing | | | |
| Getting up | | | |
| Others | | | |

4.3 Do you get proper attention when you are sick ? Yes/No

Reasons :

4.4 Do you take any tonics or medicines prescribed by the doctor ? Yes/No

| If 'Yes', name of the tonic/tablet | Reasons for taking | Duration of taking |
|------------------------------------|--------------------|--------------------|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |

4.5 During the past six months, have you received any physiotherapy ? Yes/No

4.6 If ' Yes', specify treatment taken

4.8 Do you suffer from any diseases or disorder

1. Hypertension
2. Peptic ulcer
3. Diabetes mellitus
4. Kidney diseases
5. Paralytic
6. Blood pressure
7. Asthma

4.9 Mobility of the aged

| Extent of physical mobility | Yes | No |
|-----------------------------|-----|----|
|-----------------------------|-----|----|

1. Can move about freely everywhere
2. Can move about in the neighbourhood only
3. Can move about in the house only
4. Unwillingness to get out of door - step
5. Unable to go out of doors
6. Bed - ridden
7. Others

5.0 Attitudes of the aged towards their ill - health.

Attitudes of the aged

Positive:

1. It is inevitable
2. It is just Natural
3. It could be minimised by early one

Negative

4. It is my major burden
5. It is my badluck
6. It begins a feeling of uselessness

5.1 Household activities performed by the aged :

Type of activities

1. Purchase of provisions
2. Other odd market jobs
3. Looking after grand children
4. Helps in the Kitchen
5. Gardening
6. Others

5.1.1 What type of work do you prefer to do ?

- 1.
- 2.
- 3.

5.2 Do you take the following items ? Yes/No
If 'Yes',

| Items | Quantity | Frequency |
|-----------------------------|----------|-----------|
| 1. Betal leaves | | |
| 2. Pan | | |
| 3. Alcohol | | |
| 4. Cigarette, Beedi, etc | | |
| 5. Snuff | | |
| 6. Others | | |

5.3 SOCIAL PROBLEMS :

5.4 Do the younger people give respect to you ? Yes/No
If 'Yes', are you satisfied with that ?

If ' No', What are the reasons

5.5 Do you involved in the family decision making ? Yes/No
Reasons:

5.6 Do you participate in the family functions ? Yes/No
Reasons :

5.7 Do you feel secured/neglected.

5.8 Are you involved while discussing the family matters
Yes/No

Reasons :

5.9 Do you feel burden to the family/Are you managing by yourself

6.0 Do you participate in village meetings? Yes/No

6.1 Do you get due recognition from the society ? Yes/No

6.1.1 If 'No', Specify the reasons

6.2 Do you visit your friends regularly ? Yes/No

6.2.1 If 'Yes', how often ?

1. Daily
2. Once in a week
3. Rarely

6.2.2 If ' No', why Reasons :

6.3 Are you a member of any Village Institutions? Yes/No

6.4 If ' Yes', specify

6.5 Participation on civic activities

| Organisation | Membership | | Office bearer | |
|-----------------------|------------|----|---------------|----|
| | Yes | No | Yes | No |
| 1. Panchayat | | | | |
| 2. Temple | | | | |
| 3. Political position | | | | |
| 4. Others (specify) | | | | |

6.6 Do you family members consult the family problems with you ? Yes/No

6.6.1 If 'No', Specify the reasons.

6.7 Leisure time activities of the aged:

| Activities | Number |
|------------|--------|
|------------|--------|

1. Do nothing
2. Reading religious books
3. Reading other than religious books, magazines, newspapers
4. Attend movies
5. Listen to Radio
6. Morning walk/Evening walk
7. Playing cards
8. Visit relatives/friends/Neighbours
9. Help others
10. Work on some hobby
11. Visit places of worship

Date :

Signature of the investigator

APPENDIX II

CLINICAL EXAMINATION SCHEDULE

1. Name of the subject :
2. Address of the subject :
3. Age of the subject :
4. Sex of the subject :
5. General Examination : Normal/undernourished/obese

A. Cardio vascular system

- a. Shortness of breath
- b. Chest pain
- c. Participation
- d. Swelling of legs
- e. Giddiness

B. Respiratory system

- a. Common cold
- b. Running nose
- c. Wheezing
- d. Cough

- B. Ear
 - a. Hard of hearing
 - b. Deaf and Dumb

- C. Mouth
 - a. Bad breath
 - b. Ulcer in the mouth

- D. Gum
 - a. Normal
 - b. Spongy and bleeding
 - c. Retracted

- E. Teeth
 - a. Teeth intact
 - b. Toothless
 - c. Pyrrhoea
 - e. Dental flourosis

- F. Tongue
 - a. Glossitis
 - b. Magenta tongue
 - c. Furring
 - d. Painless gummatous ulcer

- G. Glands
 - a. Thyroid enlargement
 - b. Parotid enlargement

H. Skin

- a. Normal
- b. Dry and rough
- c. Hyperkeratosis
- d. Wrinkled
- e. Phrynoderma
- f. Leucoderma
- g. Paller of the skin
- h. Loss of elasticity
- i. Spot pigmentation

I. Nails

- a. Bright
- b. Concave of flattened
- c. Clubbing conditions
- d. Inflammatory conditions
- e. Thickening of nails
- f. Separation of nail bed

J. Muscles

- a. Firm
- b. Flabby

K. Skeleton

- a. Normal
- b. Deformed

If 'Yes', specify

L. Miscellaneous

1. Fatigue
2. Scabies
3. Mood depressed
4. Vague bodily pain
5. Fever
6. Abnormal sweating
7. Oedma
8. Fits
9. Micturition problem
10. Itching
11. Non-heating ulcer
12. Injury
13. Altered gait
14. Burning
15. Numbness
16. Sleeplessness
17. Memory deficit
18. Fear
19. Excitement
20. Social impairment
21. Disorientation
22. Hallucination
23. Suicidal ideas
24. Belching
25. Palkinson's Disease
26. Leprosy

APPENDIX - VII

MEAN NUTRIENT INTAKE OF THE SUBJECTS

| | Energy (KCal/s) | Protien (gms) | Fat (gms) | Calcium (mg) | Iron (mg) | Bcardone (ug) | Thiamine (mg) | Riboblavln (mg) | Vite (mg) |
|----|--------------------|------------------|--------------|-----------------|--------------|------------------|------------------|--------------------|--------------|
| 1 | 1567.10 | 44.53 | 35.11 | 1374.70 | 28.94 | 2610.40 | 1.73 | 1.49 | 15.35 |
| 2 | 1625.95 | 46.66 | 45.26 | 1111.10 | 11.22 | 4246.00 | 1.04 | 1.47 | 42.90 |
| 3 | 1520.75 | 24.05 | 14.32 | 208.47 | 13.53 | 1083.78 | 0.91 | 0.40 | 49.53 |
| 4 | 2320.90 | 61.70 | 40.04 | 1397.00 | 64.06 | 2481.00 | 1.53 | 1.79 | 185.20 |
| 5 | 2597.75 | 59.82 | 22.83 | 389.50 | 34.76 | 1469.50 | 1.87 | 1.04 | 15.55 |
| 6 | 3695.95 | 84.03 | 29.11 | 515.55 | 42.95 | 1794.25 | 2.32 | 1.14 | 7.85 |
| 7 | 3788.80 | 92.81 | 42.90 | 1187.95 | 66.10 | 8383.00 | 2.33 | 1.73 | 109.35 |
| 8 | 3359.05 | 79.14 | 29.73 | 563.90 | 43.58 | 2481.20 | 2.46 | 1.41 | 17.60 |
| 9 | 1440.25 | 37.12 | 27.32 | 660.85 | 13.83 | 3258.60 | 0.86 | 1.12 | 17.40 |
| 10 | 2056.61 | 46.93 | 80.47 | 388.74 | 20.64 | 1464.70 | 0.97 | 0.94 | 152.70 |
| 11 | 1707.40 | 44.68 | 35.10 | 870.26 | 26.61 | 9647.60 | 1.00 | 0.58 | 351.90 |
| 12 | 1547.64 | 38.30 | 40.66 | 486.11 | 21.47 | 1926.20 | 1.07 | 0.97 | 9.87 |
| 13 | 1479.63 | 28.02 | 32.18 | 550.19 | 24.28 | 4435.20 | 0.69 | 0.81 | 137.76 |
| 14 | 1958.35 | 45.71 | 31.53 | 167.80 | 22.92 | 275.80 | 1.27 | 0.50 | 18.00 |
| 15 | 1562.65 | 39.43 | 23.80 | 179.50 | 15.39 | 528.55 | 0.95 | 0.39 | 37.40 |
| 16 | 1891.00 | 33.47 | 48.65 | 777.38 | 37.44 | 7016.66 | 0.86 | 1.01 | 141.12 |
| 17 | 1355.50 | 29.35 | 30.95 | 367.78 | 11.08 | 1607.37 | 0.71 | 0.60 | 18.04 |
| 18 | 2107.37 | 44.36 | 82.11 | 395.82 | 18.93 | 1707.94 | 1.04 | 0.83 | 69.44 |
| 19 | 1487.60 | 32.75 | 31.35 | 270.40 | 14.15 | 1388.25 | 1.07 | 0.54 | 57.75 |
| 20 | 1451.70 | 35.28 | 11.45 | 230.30 | 17.17 | 706.90 | 0.92 | 0.37 | 16.85 |
| 21 | 1247.49 | 29.81 | 18.47 | 416.14 | 12.90 | 1076.08 | 0.82 | 0.59 | 6.16 |
| 22 | 1646.28 | 40.14 | 28.24 | 285.63 | 26.21 | 1036.41 | 1.27 | 0.85 | 10.67 |
| 23 | 1357.89 | 38.48 | 24.53 | 281.97 | 15.26 | 928.40 | 0.91 | 0.61 | 27.48 |
| 24 | 1171.91 | 26.19 | 19.80 | 188.44 | 11.54 | 815.69 | 0.59 | 0.34 | 7.10 |
| 25 | 3406.00 | 89.78 | 29.78 | 309.95 | 50.19 | 845.95 | 2.69 | 0.98 | 23.35 |
| 26 | 1670.70 | 46.39 | 35.44 | 689.75 | 33.94 | 4445.51 | 1.26 | 1.16 | 58.14 |
| 27 | 1538.60 | 35.67 | 31.21 | 357.35 | 13.85 | 1532.68 | 0.73 | 0.60 | 33.70 |
| 28 | 2062.60 | 43.10 | 54.32 | 413.96 | 19.37 | 1278.19 | 1.20 | 0.82 | 35.44 |
| 29 | 1869.40 | 43.50 | 40.81 | 234.24 | 16.55 | 802.96 | 1.11 | 0.49 | 21.39 |
| 30 | 1950.70 | 57.28 | 30.48 | 504.55 | 21.61 | 2366.10 | 1.54 | 0.96 | 27.40 |
| 31 | 1730.30 | 38.63 | 37.31 | 496.27 | 18.94 | 2945.00 | 1.19 | 0.78 | 48.98 |
| 32 | 1908.10 | 55.80 | 54.52 | 1129.07 | 59.21 | 1425.00 | 1.33 | 1.64 | 338.64 |
| 33 | 1215.70 | 36.80 | 25.30 | 429.16 | 17.73 | 1976.99 | 0.86 | 0.80 | 123.80 |
| 34 | 2022.60 | 40.54 | 76.48 | 219.93 | 19.03 | 790.92 | 0.86 | 0.54 | 6.56 |
| 35 | 1856.10 | 45.17 | 38.13 | 517.87 | 21.95 | 2968.33 | 1.39 | 0.86 | 48.98 |
| 36 | 1078.40 | 25.10 | 8.84 | 299.95 | 11.06 | 1469.00 | 0.74 | 0.62 | 27.25 |
| 37 | 2092.50 | 60.94 | 88.71 | 1306.86 | 57.71 | 1323.00 | 1.13 | 1.79 | 281.84 |
| 38 | 2017.59 | 61.54 | 57.88 | 1238.31 | 21.51 | 6610.19 | 1.31 | 2.16 | 146.73 |
| 39 | 1615.63 | 35.05 | 61.48 | 228.61 | 14.57 | 790.26 | 0.80 | 0.58 | 6.24 |
| 40 | 2863.90 | 62.28 | 33.17 | 395.90 | 30.51 | 1450.80 | 1.70 | 0.87 | 10.75 |
| 41 | 2321.40 | 56.61 | 27.43 | 403.90 | 27.04 | 1204.40 | 1.47 | 0.81 | 8.85 |
| 42 | 1520.75 | 24.05 | 14.32 | 208.47 | 13.53 | 1084.00 | 0.91 | 0.40 | 49.53 |
| 43 | 1562.65 | 39.43 | 23.80 | 179.50 | 15.39 | 529.55 | 0.95 | 0.39 | 37.40 |

| | | | | | | | | | |
|----|---------|-------|-------|--------|-------|---------|------|------|--------|
| 44 | 1638.35 | 35.65 | 31.53 | 302.90 | 15.63 | 1426.75 | 1.24 | 0.56 | 80.00 |
| 45 | 2539.00 | 55.39 | 29.60 | 613.10 | 25.84 | 2660.40 | 1.55 | 1.17 | 17.15 |
| 46 | 2381.90 | 52.02 | 16.06 | 368.30 | 23.84 | 1323.90 | 1.47 | 0.75 | 4.10 |
| 47 | 3310.80 | 64.81 | 13.20 | 591.20 | 61.70 | 6216.00 | 1.97 | 0.94 | 107.00 |
| 48 | 2261.10 | 59.59 | 17.99 | 362.90 | 28.00 | 1486.90 | 1.75 | 0.75 | 15.30 |
| 49 | 1488.95 | 34.39 | 31.65 | 257.63 | 15.54 | 1075.82 | 0.98 | 0.65 | 37.50 |
| 50 | 1088.35 | 24.12 | 18.68 | 181.05 | 12.65 | 1910.70 | 0.68 | 0.31 | 40.00 |
| 51 | 2790.30 | 62.08 | 17.05 | 732.70 | 55.72 | 7021.80 | 1.76 | 1.10 | 108.40 |
| 52 | 2588.50 | 48.65 | 12.01 | 201.40 | 28.8 | 782.50 | 1.56 | 0.57 | 10.00 |
| 53 | 1903.40 | 44.86 | 12.83 | 261.40 | 21.65 | 801.90 | 1.24 | 0.53 | 13.10 |
| 54 | 3133.70 | 64.97 | 29.36 | 274.70 | 34.00 | 697.50 | 1.54 | 0.69 | 2.45 |
| 55 | 2645.20 | 55.55 | 13.63 | 238.00 | 29.84 | 1016.40 | 1.61 | 0.77 | 9.30 |
| 56 | 2200.00 | 57.46 | 49.96 | 382.50 | 17.84 | 945.50 | 1.22 | 0.72 | 27.25 |
| 57 | 1018.90 | 24.30 | 13.56 | 105.00 | 13.84 | 387.60 | 0.70 | 0.29 | 1.00 |
| 58 | 1138.50 | 20.80 | 20.57 | 153.80 | 10.93 | 712.50 | 0.61 | 0.37 | 4.75 |
| 59 | 2056.61 | 46.93 | 35.10 | 338.74 | 20.64 | 1464.00 | 0.97 | 0.94 | 182.00 |
| 60 | 1355.05 | 29.35 | 30.95 | 367.78 | 11.08 | 1607.00 | 0.71 | 0.60 | 18.00 |

APPENDIX - IV

INDIVIDUAL VALUES OF RURAL FEMALE RESPONDENTS

| S.No. | Age Yrs. | Sex | Height (cms) | Weight (kgs) | Body Mass index | Blood Press (mm/hr) | Haemo. in GMS |
|-------|----------|-----|--------------|--------------|-----------------|---------------------|---------------|
| 1 | 66 | F | 156 | 50 | 20.55 | 126/84 | 11.70 |
| 2 | 72 | F | 145 | 45 | 21.40 | 196/100 | 6.30 |
| 3 | 66 | F | 145 | 34 | 16.17 | 168/96 | 9.00 |
| 4 | 62 | F | 142 | 47 | 23.31 | 184/92 | 9.00 |
| 5 | 60 | F | 154 | 39 | 16.44 | 146/88 | 5.50 |
| 6 | 74 | F | 135 | 30 | 16.46 | 180/92 | 6.00 |
| 7 | 70 | F | 140 | 34 | 17.35 | 146/88 | 9.00 |
| 8 | 60 | F | 154 | 42 | 17.71 | 190/96 | 6.00 |
| 9 | 60 | F | 154 | 35 | 14.76 | 136/88 | 9.60 |
| 10 | 65 | F | 150 | 36 | 16.00 | 148/188 | 5.70 |
| 11 | 95 | F | 145 | 38 | 18.07 | 126/82 | 6.00 |
| 12 | 70 | F | 149 | 29 | 13.06 | 126/84 | 5.25 |
| 13 | 68 | F | 150 | 36 | 16.00 | 196/88 | 6.30 |
| 14 | 75 | F | 146 | 41 | 19.23 | 168/98 | 5.40 |
| 15 | 60 | F | 153 | 37 | 15.81 | 192/100 | 5.25 |
| 16 | 75 | F | 158 | 27 | 10.82 | 168/96 | 5.50 |
| 17 | 66 | F | 138 | 36 | 18.90 | 162/86 | 5.70 |
| 18 | 62 | F | 150 | 37 | 16.44 | 165/96 | 5.50 |
| 19 | 90 | F | 143 | 24 | 11.74 | 146/86 | 9.00 |
| 20 | 68 | F | 153 | 41 | 17.51 | 162/92 | 10.20 |
| 21 | 61 | F | 154 | 46 | 19.40 | 178/88 | 8.10 |
| 22 | 67 | F | 152 | 43 | 18.61 | 168/88 | 6.30 |
| 23 | 60 | F | 156 | 49 | 20.13 | 154/82 | 8.25 |
| 24 | 70 | F | 152 | 44 | 19.04 | 180/92 | 7.50 |
| 25 | 70 | F | 145 | 28 | 13.32 | 170/92 | 5.40 |
| 26 | 64 | F | 150 | 42 | 18.67 | 146/88 | 4.80 |
| 27 | 70 | F | 145 | 44 | 20.93 | 192/100 | 7.80 |
| 28 | 90 | F | 152 | 49 | 21.21 | 198/102 | 6.00 |
| 29 | 70 | F | 152 | 55 | 23.81 | 206/102 | 8.40 |
| 30 | 67 | F | 147 | 43 | 19.90 | 206/112 | 5.40 |
| 31 | 70 | F | 158 | 56 | 22.43 | 180/106 | 6.30 |
| 32 | 87 | F | 138 | 38 | 19.95 | 196/106 | 5.50 |
| 33 | 76 | F | 140 | 48 | 24.49 | 196/102 | 6.75 |
| 34 | 70 | F | 130 | 25 | 14.79 | 168/88 | 5.70 |
| 35 | 67 | F | 147 | 45 | 20.82 | 188/96 | 5.40 |
| 36 | 78 | F | 155 | 53 | 22.06 | 206/112 | 5.10 |
| 37 | 66 | F | 155 | 55 | 22.89 | 146/88 | 9.30 |
| 38 | 70 | F | 150 | 59 | 26.22 | 180/98 | 6.75 |
| 39 | 72 | F | 154 | 33 | 13.91 | 140/100 | 6.30 |
| 40 | 63 | F | 150 | 45 | 20.00 | 196/98 | 6.90 |
| 41 | 67 | F | 152 | 75 | 32.46 | 176/98 | 5.70 |
| 42 | 63 | F | 141 | 39 | 19.62 | 146/88 | 7.50 |

| | | | | | | | |
|----|----|---|-----|----|-------|---------|-------|
| 43 | 70 | F | 148 | 40 | 18.26 | 178/96 | 6.00 |
| 44 | 60 | F | 145 | 72 | 34.24 | 152/86 | 9.00 |
| 45 | 61 | F | 150 | 65 | 28.89 | 156/08 | 9.00 |
| 46 | 66 | F | 140 | 40 | 20.41 | 140/98 | 9.00 |
| 47 | 70 | F | 146 | 36 | 16.89 | 178/98 | 6.60 |
| 48 | 65 | F | 148 | 42 | 19.17 | 168/88 | 12.00 |
| 49 | 75 | F | 160 | 43 | 16.80 | 152/88 | 5.70 |
| 50 | 65 | F | 134 | 28 | 15.59 | 148/86 | 5.80 |
| 51 | 75 | F | 141 | 42 | 21.13 | 186/96 | 6.00 |
| 52 | 65 | F | 145 | 35 | 16.65 | 146/92 | 9.00 |
| 53 | 70 | F | 152 | 36 | 15.58 | 188/96 | 9.00 |
| 54 | 70 | F | 158 | 38 | 15.22 | 192/100 | 5.70 |
| 55 | 60 | F | 150 | 39 | 17.33 | 196/102 | 12.30 |
| 56 | 65 | F | 145 | 41 | 19.50 | 168/96 | 10.20 |
| 57 | 75 | F | 150 | 36 | 16.00 | 172/88 | 7.20 |
| 58 | 70 | F | 150 | 42 | 18.67 | 168/96 | 5.50 |
| 59 | 70 | F | 167 | 45 | 16.14 | 196/96 | 7.20 |
| 60 | 70 | F | 152 | 38 | 16.45 | 190/88 | 6.00 |
| 61 | 70 | F | 143 | 42 | 20.54 | 196/86 | 7.50 |
| 62 | 65 | F | 150 | 43 | 19.11 | 162/96 | 6.00 |
| 63 | 65 | F | 153 | 51 | 21.79 | 186/100 | 7.80 |
| 64 | 63 | F | 153 | 49 | 20.93 | 186/96 | 10.20 |
| 65 | 62 | F | 150 | 37 | 16.44 | 192/98 | 10.20 |
| 66 | 65 | F | 144 | 47 | 22.67 | 186/98 | 6.00 |
| 67 | 65 | F | 126 | 25 | 15.75 | 196/102 | 9.00 |
| 68 | 60 | F | 146 | 25 | 11.73 | 182/96 | 8.40 |
| 69 | 65 | F | 155 | 42 | 17.48 | 168/96 | 6.00 |
| 70 | 60 | F | 150 | 33 | 14.67 | 146/84 | 6.30 |
| 71 | 70 | F | 155 | 45 | 18.73 | 182/96 | 7.50 |
| 72 | 70 | F | 143 | 41 | 20.05 | 186/96 | 8.25 |
| 73 | 80 | F | 142 | 50 | 24.80 | 168/88 | 5.50 |
| 74 | 60 | F | 158 | 48 | 19.23 | 148/80 | 8.40 |
| 75 | 70 | F | 159 | 40 | 15.82 | 180/86 | 7.80 |
| 76 | 65 | F | 140 | 35 | 17.86 | 142/88 | 5.50 |
| 77 | 70 | F | 145 | 35 | 16.65 | 182/96 | 6.90 |
| 78 | 80 | F | 141 | 25 | 12.57 | 142/86 | 6.30 |
| 79 | 62 | F | 147 | 49 | 22.68 | 160/92 | 10.20 |
| 80 | 68 | F | 140 | 29 | 14.80 | 162/88 | 6.00 |
| 81 | 72 | F | 145 | 28 | 13.32 | 160/86 | 6.30 |
| 82 | 65 | F | 156 | 43 | 17.67 | 148/86 | 7.20 |
| 83 | 85 | F | 146 | 28 | 13.14 | 192/96 | 5.50 |
| 84 | 63 | F | 115 | 35 | 26.47 | 192/88 | 9.00 |
| 85 | 88 | F | 140 | 28 | 14.29 | 160/92 | 5.50 |
| 86 | 68 | F | 120 | 28 | 19.44 | 202/116 | 6.90 |
| 87 | 67 | F | 140 | 39 | 19.90 | 196/98 | 6.00 |
| 88 | 86 | F | 140 | 29 | 14.80 | 186/96 | 5.40 |
| 89 | 70 | F | 145 | 30 | 14.27 | 176/98 | 7.50 |
| 90 | 65 | F | 145 | 34 | 16.17 | 192/98 | 6.30 |
| 91 | 60 | F | 145 | 40 | 19.02 | 96/68 | 6.90 |
| 92 | 70 | F | 160 | 36 | 14.06 | 168/88 | 6.30 |

| | | | | | | | |
|-----|----|---|-----|----|-------|---------|-------|
| 93 | 65 | F | 145 | 35 | 16.65 | 196/88 | 6.00 |
| 94 | 65 | F | 145 | 38 | 18.07 | 192/102 | 5.70 |
| 95 | 70 | F | 153 | 53 | 22.64 | 188/100 | 5.50 |
| 96 | 68 | F | 155 | 33 | 13.74 | 148/86 | 5.40 |
| 97 | 64 | F | 159 | 38 | 15.03 | 192/88 | 5.80 |
| 98 | 62 | F | 158 | 54 | 21.63 | 148/88 | 9.00 |
| 99 | 65 | F | 148 | 40 | 18.26 | 146/86 | 5.40 |
| 100 | 78 | F | 148 | 30 | 13.70 | 198/106 | 5.40 |
| 101 | 73 | F | 158 | 42 | 6.82 | 188/86 | 5.70 |
| 102 | 61 | F | 143 | 35 | 17.12 | 188/96 | 6.00 |
| 103 | 67 | F | 151 | 32 | 14.03 | 168/92 | 5.50 |
| 104 | 62 | F | 149 | 29 | 13.06 | 146/92 | 5.80 |
| 105 | 65 | F | 155 | 35 | 14.57 | 168/96 | 6.30 |
| 106 | 78 | F | 147 | 28 | 12.96 | 192/100 | 5.50 |
| 107 | 65 | F | 154 | 49 | 20.66 | 188/96 | 6.90 |
| 108 | 67 | F | 152 | 24 | 10.39 | 192/86 | 5.80 |
| 109 | 60 | F | 147 | 40 | 18.51 | 198/98 | 6.00 |
| 110 | 60 | F | 152 | 40 | 17.31 | 186/88 | 5.50 |
| 111 | 70 | F | 154 | 67 | 28.25 | 168/96 | 8.40 |
| 112 | 65 | F | 149 | 37 | 16.67 | 196/98 | 5.25 |
| 113 | 60 | F | 144 | 50 | 24.11 | 186/88 | 8.25 |
| 114 | 60 | F | 147 | 40 | 18.51 | 198/98 | 6.00 |
| 115 | 67 | F | 152 | 24 | 10.39 | 192/86 | 5.80 |
| 116 | 65 | F | 150 | 43 | 19.11 | 162/96 | 6.00 |
| 117 | 62 | F | 147 | 49 | 22.68 | 160/92 | 10.20 |
| 118 | 60 | F | 145 | 40 | 19.02 | 196/68 | 6.90 |
| 119 | 64 | F | 159 | 38 | 15.03 | 192/88 | 5.80 |
| 120 | 60 | F | 150 | 33 | 14.67 | 146/84 | 6.30 |
| 121 | 70 | F | 150 | 42 | 18.67 | 168/96 | 5.00 |
| 122 | 60 | F | 158 | 48 | 19.23 | 148/80 | 8.00 |
| 123 | 67 | F | 140 | 39 | 19.90 | 196/98 | 6.00 |
| 124 | 65 | F | 145 | 38 | 18.07 | 192/102 | 5.70 |
| 125 | 60 | F | 152 | 40 | 17.31 | 186/88 | 5.50 |
| 126 | 62 | F | 158 | 54 | 21.63 | 148/88 | 9.00 |
| 127 | 70 | F | 155 | 45 | 18.73 | 182/96 | 7.50 |
| 128 | 62 | F | 149 | 29 | 13.06 | 146/92 | 5.80 |
| 129 | 65 | F | 148 | 40 | 18.26 | 146/86 | 5.40 |
| 130 | 61 | F | 143 | 35 | 17.12 | 186/96 | 6.00 |
| 131 | 68 | F | 155 | 33 | 13.74 | 148/86 | 5.40 |
| 132 | 63 | F | 115 | 35 | 26.47 | 192/88 | 9.00 |
| 133 | 65 | F | 156 | 43 | 17.67 | 141/86 | 7.20 |
| 134 | 65 | F | 140 | 35 | 17.86 | 142/88 | 5.50 |
| 135 | 60 | F | 158 | 48 | 19.23 | 148/80 | 8.40 |
| 136 | 65 | F | 144 | 47 | 22.67 | 186/98 | 6.00 |
| 137 | 64 | F | 159 | 38 | 15.03 | 192/88 | 5.80 |
| 138 | 65 | F | 150 | 37 | 16.44 | 192/98 | 7.80 |
| 139 | 62 | F | 147 | 49 | 22.68 | 160/92 | 10.20 |
| 140 | 70 | F | 153 | 53 | 22.64 | 188/100 | 5.50 |
| 141 | 65 | F | 148 | 40 | 18.26 | 146/86 | 5.40 |
| 142 | 60 | F | 145 | 40 | 19.02 | 96/38 | 6.90 |

| | | | | | | | |
|-----|----|---|-----|----|-------|---------|-------|
| 143 | 68 | F | 140 | 29 | 14.80 | 162/88 | 6.00 |
| 144 | 61 | F | 143 | 35 | 17.12 | 188/96 | 6.00 |
| 145 | 60 | F | 144 | 50 | 24.11 | 186/88 | 8.25 |
| 146 | 68 | F | 120 | 28 | 19.44 | 202/116 | 6.90 |
| 147 | 65 | F | 140 | 35 | 17.86 | 142/88 | 5.50 |
| 148 | 60 | F | 146 | 25 | 11.73 | 182/96 | 8.40 |
| 149 | 60 | F | 150 | 33 | 14.67 | 146/84 | 6.30 |
| 150 | 65 | F | 145 | 41 | 19.50 | 168/96 | 10.20 |
| 151 | 66 | F | 140 | 40 | 20.41 | 140/20 | 9.00 |
| 152 | 66 | F | 155 | 55 | 22.89 | 146/88 | 9.30 |
| 153 | 64 | F | 150 | 42 | 18.67 | 146/88 | 5.80 |
| 154 | 62 | F | 142 | 47 | 23.31 | 184/92 | 9.00 |
| 155 | 65 | F | 148 | 42 | 19.17 | 168/88 | 12.00 |
| 156 | 70 | F | 145 | 44 | 20.93 | 192/100 | 7.80 |
| 157 | 66 | F | 156 | 50 | 20.55 | 126/84 | 11.70 |
| 158 | 62 | F | 147 | 49 | 22.68 | 160/92 | 10.20 |
| 159 | 63 | F | 141 | 39 | 19.62 | 146/88 | 7.50 |
| 160 | 65 | F | 150 | 36 | 16.00 | 148/188 | 5.70 |
| 161 | 70 | F | 152 | 55 | 23.81 | 206/102 | 8.40 |
| 162 | 60 | F | 140 | 25 | 11.73 | 182/96 | 8.40 |
| 163 | 60 | F | 147 | 40 | 18.51 | 198/98 | 6.00 |
| 164 | 70 | F | 167 | 45 | 60.14 | 196/96 | 7.20 |
| 165 | 68 | F | 140 | 29 | 14.80 | 162/88 | 6.00 |
| 166 | 60 | F | 154 | 39 | 16.4 | 146/88 | 5.50 |
| 167 | 68 | F | 150 | 36 | 16.0 | 196/88 | 6.30 |
| 168 | 90 | F | 152 | 49 | 21.21 | 198/102 | 6.00 |
| 169 | 70 | F | 158 | 56 | 22.43 | 180/106 | 6.30 |
| 170 | 64 | F | 159 | 38 | 15.03 | 192/88 | 5.80 |
| 171 | 68 | F | 140 | 29 | 14.80 | 162/88 | 6.00 |
| 172 | 62 | F | 158 | 54 | 21.63 | 148/88 | 9.00 |
| 173 | 80 | F | 141 | 25 | 12.57 | 142/86 | 6.30 |
| 174 | 66 | F | 140 | 40 | 20.41 | 140/20 | 9.00 |
| 175 | 90 | F | 143 | 23 | 11.74 | 146/86 | 9.00 |
| 176 | 70 | F | 152 | 55 | 23.81 | 206/102 | 8.40 |
| 177 | 75 | F | 150 | 36 | 16.00 | 172/88 | 7.20 |
| 178 | 61 | F | 154 | 46 | 19.40 | 178/88 | 8.10 |
| 179 | 63 | F | 150 | 45 | 20.00 | 196/98 | 6.90 |
| 180 | 87 | F | 138 | 38 | 19.95 | 196/106 | 5.50 |
| 181 | 65 | F | 154 | 49 | 20.66 | 185/96 | 6.90 |
| 182 | 70 | F | 155 | 45 | 18.73 | 182/96 | 7.50 |
| 183 | 70 | F | 130 | 25 | 14.79 | 168/88 | 5.70 |
| 184 | 61 | F | 150 | 65 | 28.89 | 156/88 | 9.00 |
| 185 | 67 | F | 152 | 43 | 18.61 | 165/88 | 6.30 |
| 186 | 66 | F | 155 | 55 | 22.89 | 146/88 | 9.30 |
| 187 | 72 | F | 145 | 45 | 21.40 | 196/100 | 6.30 |
| 188 | 88 | F | 140 | 28 | 14.29 | 160/92 | 5.50 |
| 189 | 60 | F | 147 | 40 | 18.51 | 198/98 | 6.00 |
| 190 | 65 | F | 145 | 34 | 16.17 | 192/98 | 6.30 |
| 191 | 61 | F | 143 | 35 | 17.12 | 188/96 | 6.00 |
| 192 | 60 | F | 146 | 25 | 11.73 | 182/96 | 8.40 |

| | | | | | | | |
|-----|----|---|-----|----|-------|---------|-------|
| 193 | 65 | F | 145 | 35 | 16.65 | 196/88 | 6.00 |
| 194 | 78 | F | 148 | 30 | 13.70 | 198/106 | 5.40 |
| 195 | 65 | F | 140 | 35 | 17.86 | 142/88 | 5.50 |
| 196 | 65 | F | 144 | 47 | 22.67 | 186/98 | 6.00 |
| 197 | 62 | F | 150 | 37 | 16.44 | 165/96 | 5.50 |
| 198 | 70 | F | 140 | 34 | 17.35 | 146/88 | 9.00 |
| 199 | 68 | F | 150 | 36 | 16.00 | 196/88 | 6.30 |
| 200 | 60 | F | 156 | 49 | 20.13 | 154/82 | 8.25 |
| 201 | 67 | F | 147 | 43 | 19.90 | 206/112 | 5.40 |
| 202 | 90 | F | 152 | 49 | 21.21 | 198/102 | 6.00 |
| 203 | 66 | F | 145 | 34 | 16.17 | 168/96 | 9.00 |
| 204 | 63 | F | 150 | 45 | 20.00 | 196/98 | 6.90 |
| 205 | 60 | F | 150 | 39 | 17.33 | 196/102 | 12.30 |
| 206 | 70 | F | 150 | 59 | 26.22 | 180/98 | 6.75 |
| 207 | 63 | F | 115 | 35 | 26.47 | 192/88 | 9.00 |
| 208 | 65 | F | 153 | 32 | 13.07 | 192/106 | 10.20 |

REPORT ON RURAL MALE RESPONDENTS

| S.No. | Age | Sex | Height | Weight | Body Mass | Blood Press | Haemo. in GMS |
|-------|-----|-----|--------|--------|-----------|-------------|---------------|
| 1 | 64 | M | 163 | 46 | 17.31 | 190/96 | 6.75 |
| 2 | 65 | M | 160 | 38 | 14.84 | 188/98 | 6.90 |
| 3 | 90 | M | 147 | 35 | 16.20 | 182/96 | 7.80 |
| 4 | 70 | M | 164 | 49 | 18.22 | 136/84 | 10.80 |
| 5 | 61 | M | 161 | 59 | 22.76 | 162/92 | 10.20 |
| 6 | 66 | M | 162 | 40 | 15.24 | 114/68 | 7.80 |
| 7 | 70 | M | 156 | 50 | 20.55 | 146/92 | 9.00 |
| 8 | 70 | M | 158 | 40 | 16.02 | 178/98 | 9.00 |
| 9 | 75 | M | 156 | 59 | 24.24 | 206/118 | 8.40 |
| 10 | 65 | M | 173 | 44 | 14.70 | 186/100 | 7.50 |
| 11 | 91 | M | 156 | 40 | 16.44 | 198/108 | 5.50 |
| 12 | 65 | M | 158 | 35 | 14.02 | 192/100 | 6.75 |
| 13 | 72 | M | 165 | 35 | 12.86 | 178/98 | 6.90 |
| 14 | 67 | M | 165 | 47 | 17.26 | 192/98 | 9.00 |
| 15 | 70 | M | 155 | 48 | 19.98 | 162/88 | 8.40 |
| 16 | 62 | M | 147 | 40 | 18.51 | 186/88 | 13.20 |
| 17 | 80 | M | 158 | 53 | 21.23 | 146/88 | 10.20 |
| 18 | 75 | M | 147 | 28 | 12.96 | 192/102 | 5.40 |
| 19 | 72 | M | 164 | 61 | 22.68 | 168/96 | 10.20 |
| 20 | 65 | M | 158 | 50 | 20.03 | 196/102 | 10.20 |
| 21 | 65 | M | 158 | 35 | 14.02 | 168/96 | 9.00 |
| 22 | 75 | M | 159 | 47 | 18.59 | 196/102 | 6.00 |
| 23 | 67 | M | 159 | 23 | 09.10 | 160/86 | 6.30 |
| 24 | 85 | M | 161 | 51 | 19.68 | 198/112 | 7.50 |
| 25 | 62 | M | 165 | 41 | 15.06 | 202/112 | 5.80 |
| 26 | 70 | M | 157 | 55 | 22.31 | 186/96 | 11.70 |
| 27 | 63 | M | 175 | 57 | 18.61 | 188/96 | 6.90 |
| 28 | 66 | M | 161 | 50 | 19.26 | 176/92 | 6.90 |
| 29 | 60 | M | 162 | 53 | 20.20 | 190/100 | 9.90 |
| 30 | 65 | M | 156 | 46 | 18.90 | 168/96 | 9.00 |
| 31 | 78 | M | 150 | 30 | 13.33 | 106/96 | 9.00 |
| 32 | 65 | M | 164 | 65 | 24.17 | 198/108 | 10.20 |
| 33 | 65 | M | 160 | 35 | 14.02 | 192/100 | 6.75 |
| 34 | 72 | M | 158 | 35 | 12.86 | 178/98 | 6.90 |
| 35 | 72 | M | 165 | 61 | 22.68 | 168/96 | 10.20 |
| 36 | 65 | M | 164 | 50 | 20.03 | 126/102 | 10.20 |
| 37 | 85 | M | 158 | 51 | 19.68 | 198/112 | 7.50 |
| 38 | 66 | M | 161 | 40 | 15.24 | 114/68 | 7.80 |
| 39 | 64 | M | 162 | 46 | 17.31 | 190/96 | 6.75 |
| 40 | 61 | M | 163 | 59 | 22.76 | 162/92 | 10.20 |
| 41 | 70 | M | 161 | 50 | 20.55 | 146/92 | 9.00 |
| 42 | 65 | M | 156 | 44 | 14.70 | 186/100 | 7.50 |
| 43 | 65 | M | 173 | 38 | 14.84 | 188/98 | 6.90 |
| 44 | 70 | M | 160 | 49 | 18.22 | 136/84 | 10.80 |
| 45 | 67 | M | 164 | 23 | 19.10 | 160/86 | 6.30 |

| | | | | | | | |
|----|----|---|-----|----|-------|---------|-------|
| 46 | 66 | M | 159 | 50 | 19.20 | 176/92 | 6.90 |
| 47 | 65 | M | 161 | 65 | 24.15 | 198/108 | 10.20 |
| 48 | 67 | M | 164 | 47 | 17.26 | 192/98 | 9.00 |
| 49 | 70 | M | 165 | 50 | 20.55 | 146/92 | 9.00 |
| 50 | 61 | M | 156 | 59 | 22.76 | 162/92 | 10.00 |
| 51 | 65 | M | 161 | 38 | 14.84 | 188/98 | 6.90 |
| 52 | 65 | M | 160 | 35 | 14.02 | 168/96 | 9.00 |
| 53 | 62 | M | 158 | 41 | 15.06 | 202/112 | 6.80 |
| 54 | 60 | M | 165 | 53 | 20.23 | 190/100 | 9.90 |
| 55 | 65 | M | 156 | 46 | 18.90 | 168/96 | 9.00 |
| 56 | 78 | M | 115 | 30 | 13.33 | 106/96 | 9.00 |
| 57 | 65 | M | 164 | 65 | 24.17 | 198/108 | 10.20 |
| 58 | 62 | M | 147 | 40 | 18.50 | 186/88 | 13.20 |
| 59 | 72 | M | 164 | 61 | 22.68 | 168/96 | 10.20 |
| 60 | 75 | M | 159 | 47 | 18.59 | 196/102 | 6.00 |
| 61 | 67 | M | 159 | 23 | 19.10 | 160/86 | 6.30 |
| 62 | 65 | M | 158 | 35 | 14.02 | 192/100 | 6.75 |
| 63 | 70 | M | 155 | 48 | 19.98 | 162/88 | 8.40 |
| q4 | 72 | M | 164 | 61 | 22.68 | 168/96 | 10.20 |
| 65 | 64 | M | 163 | 46 | 17.31 | 190/96 | 6.75 |
| 66 | 70 | M | 156 | 50 | 20.55 | 146/92 | 9.00 |
| 67 | 65 | M | 160 | 38 | 14.84 | 188/98 | 6.00 |
| 68 | 70 | M | 164 | 49 | 18.22 | 136/84 | 10.20 |
| 69 | 65 | M | 173 | 44 | 14.70 | 186/100 | 7.50 |
| 70 | 65 | M | 158 | 35 | 14.02 | 168/96 | 9.00 |
| 71 | 60 | M | 162 | 53 | 20.20 | 190/100 | 9.90 |
| 72 | 65 | M | 156 | 46 | 18.90 | 168/96 | 9.00 |
| 73 | 65 | M | 158 | 35 | 14.02 | 192/100 | 6.75 |
| 74 | 66 | M | 152 | 40 | 15.24 | 114/68 | 7.80 |
| 75 | 70 | M | 164 | 49 | 18.22 | 136/84 | 10.80 |
| 76 | 65 | M | 173 | 44 | 14.70 | 186/100 | 7.50 |
| 77 | 75 | M | 156 | 59 | 24.24 | 206/118 | 8.40 |
| 78 | 70 | M | 158 | 40 | 16.02 | 178/98 | 9.00 |
| 79 | 70 | M | 156 | 50 | 20.55 | 146/92 | 9.00 |
| 80 | 67 | M | 159 | 23 | 19.10 | 160/86 | 6.30 |
| 81 | 63 | M | 175 | 57 | 18.61 | 188/96 | 6.90 |
| 82 | 60 | M | 162 | 53 | 20.20 | 190/100 | 9.90 |
| 83 | 65 | M | 156 | 56 | 18.90 | 116/96 | 9.00 |
| 84 | 60 | M | 162 | 53 | 20.20 | 190/100 | 9.00 |
| 85 | 65 | M | 164 | 65 | 24.17 | 198/108 | 10.20 |
| 86 | 78 | M | 150 | 30 | 13.33 | 106/96 | 9.00 |
| 87 | 70 | M | 157 | 55 | 22.31 | 186/96 | 11.70 |
| 88 | 62 | M | 156 | 41 | 15.06 | 198/112 | 7.50 |
| 89 | 75 | M | 159 | 47 | 18.59 | 196/102 | 6.00 |
| 90 | 65 | M | 158 | 35 | 14.02 | 168/96 | 9.00 |
| 91 | 65 | M | 173 | 44 | 14.70 | 186/100 | 7.50 |
| 92 | 64 | M | 163 | 46 | 17.31 | 190/96 | 6.75 |

REPORT ON URBAN FEMALE RESPONDENTS

| S.No. | Age | Sex | Height | Weight | Body Mass | Blood Press | Haemo. in GMS |
|-------|-----|-----|--------|--------|-----------|-------------|---------------|
| 1 | 60 | F | 152 | 37 | 16.01 | 120/84 | 9.75 |
| 2 | 61 | F | 150 | 60 | 26.67 | 140/96 | 10.50 |
| 3 | 60 | F | 158 | 49 | 14.66 | 140/90 | 10.50 |
| 4 | 64 | F | 145 | 37 | 17.60 | 130/86 | 10.50 |
| 5 | 60 | F | 156 | 75 | 30.82 | 180/100 | 10.50 |
| 6 | 60 | F | 142 | 37 | 18.35 | 120/76 | 9.75 |
| 7 | 80 | F | 151 | 39 | 17.10 | 140/80 | 9.75 |
| 8 | 60 | F | 155 | 55 | 22.89 | 140/90 | 10.50 |
| 9 | 60 | F | 155 | 51 | 21.23 | 130/84 | 9.75 |
| 10 | 75 | F | 146 | 47 | 22.05 | 130/80 | 9.75 |
| 11 | 64 | F | 137 | 43 | 22.91 | 160/84 | 10.50 |
| 12 | 65 | F | 152 | 37 | 16.01 | 146/88 | 9.75 |
| 13 | 70 | F | 145 | 65 | 30.92 | 190/110 | 10.50 |
| 14 | 80 | F | 152 | 44 | 19.04 | 160/100 | 9.75 |
| 15 | 70 | F | 142 | 84 | 41.66 | 140/88 | 10.50 |
| 16 | 70 | F | 146 | 55 | 25.80 | 160/80 | 9.00 |
| 17 | 60 | F | 151 | 87 | 38.16 | 130/80 | 10.50 |
| 18 | 70 | F | 153 | 47 | 20.08 | 136/90 | 9.75 |
| 19 | 70 | F | 144 | 41 | 19.77 | 136/90 | 9.75 |
| 20 | 75 | F | 149 | 35 | 15.77 | 140/88 | 9.00 |
| 21 | 65 | F | 148 | 47 | 21.46 | 116/80 | 9.75 |
| 22 | 70 | F | 133 | 35 | 19.79 | 136/86 | 9.75 |
| 23 | 85 | F | 148 | 55 | 25.11 | 180/100 | 9.75 |
| 24 | 62 | F | 147 | 51 | 23.60 | 140/90 | 10.50 |
| 25 | 68 | F | 143 | 37 | 18.09 | 110/80 | 9.75 |
| 26 | 60 | F | 147 | 59 | 27.30 | 130/80 | 10.50 |
| 27 | 70 | F | 149 | 35 | 15.77 | 110/70 | 8.25 |
| 28 | 60 | F | 148 | 51 | 23.28 | 126/86 | 9.75 |
| 29 | 65 | F | 150 | 60 | 26.67 | 118/76 | 10.50 |
| 30 | 90 | F | 148 | 40 | 18.26 | 100/70 | 10.50 |
| 31 | 68 | F | 140 | 55 | 28.06 | 124/86 | 10.50 |
| 32 | 64 | F | 164 | 61 | 22.68 | 126/86 | 9.75 |
| 33 | 60 | F | 139 | 58 | 30.02 | 126/80 | 10.50 |
| 34 | 60 | F | 153 | 66 | 28.19 | 170/80 | 10.50 |
| 35 | 65 | F | 150 | 40 | 17.78 | 110/80 | 9.75 |
| 36 | 60 | F | 144 | 71 | 34.24 | 140/88 | 10.50 |
| 37 | 60 | F | 148 | 54 | 24.65 | 136/100 | 10.50 |
| 38 | 65 | F | 160 | 50 | 19.53 | 146/90 | 11.25 |
| 39 | 60 | F | 167 | 46 | 16.49 | 196/100 | 9.75 |
| 40 | 72 | F | 150 | 41 | 18.22 | 116/60 | 9.00 |
| 41 | 60 | F | 160 | 55 | 21.48 | 136/86 | 9.75 |
| 42 | 60 | F | 161 | 53 | 20.45 | 118/80 | 9.75 |
| 43 | 72 | F | 146 | 39 | 18.30 | 140/90 | 9.75 |
| 44 | 60 | F | 146 | 64 | 30.02 | 126/90 | 9.75 |
| 45 | 65 | F | 155 | 46 | 19.15 | 126/90 | 11.25 |

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|----|----|---|-----|----|-------|--------|-------|
| 46 | 62 | F | 159 | 61 | 24.13 | 146/98 | 9.75 |
| 47 | 70 | F | 140 | 35 | 17.86 | 160/86 | 10.50 |
| 48 | 70 | F | 147 | 35 | 16.20 | 160/86 | 9.60 |
| 49 | 65 | F | 135 | 32 | 17.56 | 136/80 | 9.80 |
| 50 | 69 | F | 146 | 35 | 16.42 | 140/90 | 9.75 |
| 51 | 65 | F | 158 | 75 | 30.04 | 136/88 | 10.20 |
| 52 | 65 | F | 145 | 59 | 28.06 | 110/70 | 10.80 |
| 53 | 60 | F | 154 | 35 | 14.76 | 110/70 | 9.75 |
| 54 | 65 | F | 145 | 39 | 18.55 | 106/70 | 9.75 |
| 55 | 64 | F | 148 | 80 | 36.52 | 126/80 | 10.50 |
| 56 | 60 | F | 142 | 52 | 25.79 | 140/86 | 10.50 |
| 57 | 61 | F | 154 | 51 | 21.50 | 140/88 | 10.50 |
| 58 | 65 | F | 155 | 46 | 19.15 | 126/90 | 11.25 |
| 59 | 72 | F | 150 | 41 | 18.22 | 116/60 | 9.00 |
| 60 | 60 | F | 146 | 64 | 30.02 | 126/90 | 9.75 |
| 61 | 72 | F | 146 | 39 | 18.30 | 140/90 | 9.75 |
| 62 | 65 | F | 160 | 50 | 19.53 | 140/90 | 11.25 |
| 63 | 61 | F | 150 | 60 | 26.67 | 140/96 | 10.50 |
| 64 | 64 | F | 145 | 37 | 17.60 | 130/86 | 10.50 |
| 65 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 66 | 64 | F | 137 | 43 | 22.91 | 160/84 | 10.50 |
| 67 | 70 | F | 146 | 55 | 25.80 | 160/80 | 10.50 |
| 68 | 65 | F | 148 | 47 | 21.46 | 116/80 | 9.75 |
| 69 | 62 | F | 147 | 51 | 23.60 | 140/90 | 10.50 |
| 70 | 65 | F | 150 | 60 | 26.67 | 118/76 | 10.50 |
| 71 | 64 | F | 140 | 55 | 26.06 | 124/86 | 10.50 |
| 72 | 68 | F | 148 | 40 | 18.26 | 100/70 | 10.50 |
| 73 | 70 | F | 133 | 35 | 19.79 | 136/86 | 9.75 |
| 74 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 75 | 70 | F | 142 | 84 | 41.66 | 140/88 | 10.50 |
| 76 | 60 | F | 152 | 37 | 16.01 | 120/84 | 9.75 |
| 77 | 65 | F | 153 | 66 | 28.19 | 170/80 | 10.50 |
| 78 | 72 | F | 146 | 39 | 18.30 | 140/90 | 9.75 |
| 79 | 61 | F | 150 | 60 | 26.67 | 140/96 | 10.50 |
| 80 | 68 | F | 148 | 40 | 18.26 | 100/70 | 10.50 |
| 81 | 61 | F | 150 | 60 | 26.67 | 140/96 | 10.50 |
| 82 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 83 | 70 | F | 142 | 84 | 41.66 | 140/88 | 10.50 |
| 84 | 70 | F | 144 | 41 | 19.77 | 130/90 | 9.75 |
| 85 | 60 | F | 152 | 37 | 16.01 | 120/84 | 9.75 |
| 86 | 60 | F | 146 | 64 | 30.02 | 126/90 | 9.75 |
| 87 | 60 | F | 161 | 53 | 20.45 | 118/80 | 9.75 |
| 88 | 65 | F | 160 | 50 | 19.53 | 146/90 | 11.25 |
| 89 | 72 | F | 150 | 41 | 18.22 | 116/60 | 9.00 |
| 90 | 70 | F | 149 | 35 | 15.77 | 110/70 | 8.25 |
| 91 | 65 | F | 150 | 60 | 26.67 | 118/76 | 10.50 |
| 92 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 93 | 60 | F | 155 | 51 | 21.23 | 130/87 | 9.75 |
| 94 | 64 | F | 145 | 37 | 17.60 | 130/86 | 10.50 |
| 95 | 60 | F | 142 | 37 | 18.35 | 120/76 | 9.75 |

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|-----|----|---|-----|----|-------|---------|-------|
| 96 | 68 | F | 146 | 37 | 18.09 | 110/80 | 9.75 |
| 97 | 68 | F | 148 | 40 | 18.26 | 100/70 | 10.50 |
| 98 | 60 | F | 167 | 46 | 16.49 | 196/100 | 9.75 |
| 99 | 72 | F | 150 | 41 | 18.22 | 116/60 | 9.00 |
| 100 | 72 | F | 146 | 39 | 18.30 | 140/90 | 9.75 |
| 101 | 65 | F | 152 | 37 | 16.01 | 146/88 | 10.50 |
| 102 | 70 | F | 142 | 84 | 41.66 | 140/88 | 10.50 |
| 103 | 60 | F | 151 | 87 | 38.16 | 130/80 | 9.75 |
| 104 | 65 | F | 148 | 47 | 21.46 | 116/80 | 9.75 |
| 105 | 61 | F | 150 | 60 | 26.67 | 140/96 | 10.50 |
| 106 | 64 | F | 142 | 37 | 17.60 | 130/86 | 10.50 |
| 107 | 80 | F | 151 | 39 | 17.10 | 140/80 | 10.50 |
| 108 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 109 | 60 | F | 151 | 87 | 38.16 | 130/80 | 9.75 |
| 110 | 70 | F | 133 | 35 | 19.79 | 136/86 | 9.75 |
| 111 | 60 | F | 147 | 59 | 27.30 | 130/80 | 10.50 |
| 112 | 60 | F | 148 | 51 | 23.28 | 126/86 | 10.50 |
| 113 | 64 | F | 164 | 61 | 22.68 | 126/86 | 9.75 |
| 114 | 60 | F | 144 | 71 | 34.24 | 140/88 | 10.50 |
| 115 | 65 | F | 155 | 46 | 19.15 | 126/90 | 11.25 |
| 116 | 72 | F | 150 | 41 | 18.22 | 116/60 | 9.00 |
| 117 | 60 | F | 167 | 46 | 16.49 | 196/100 | 9.75 |
| 118 | 60 | F | 152 | 37 | 16.01 | 120/84 | 9.75 |
| 119 | 64 | F | 144 | 37 | 17.60 | 130/86 | 10.50 |
| 120 | 75 | F | 149 | 35 | 15.77 | 140/88 | 9.75 |
| 121 | 68 | F | 143 | 37 | 18.09 | 110/80 | 10.50 |
| 122 | 68 | F | 140 | 55 | 28.06 | 124/86 | 10.50 |
| 123 | 72 | F | 146 | 39 | 18.30 | 140/90 | 9.75 |
| 124 | 60 | F | 152 | 37 | 16.00 | 120/84 | 9.75 |
| 125 | 64 | F | 145 | 37 | 17.60 | 130/86 | 10.50 |
| 126 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 127 | 64 | F | 137 | 43 | 22.91 | 160/84 | 9.75 |
| 128 | 70 | F | 146 | 55 | 25.80 | 160/80 | 10.50 |
| 129 | 75 | F | 149 | 35 | 15.77 | 140/88 | 9.75 |
| 130 | 65 | F | 155 | 46 | 19.15 | 126/90 | 11.25 |
| 131 | 65 | F | 160 | 50 | 19.53 | 146/90 | 11.25 |
| 132 | 70 | F | 149 | 35 | 15.77 | 110/70 | 8.25 |
| 133 | 70 | F | 142 | 84 | 41.66 | 140/88 | 9.00 |
| 134 | 61 | F | 150 | 60 | 26.67 | 140/96 | 10.50 |
| 135 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 136 | 65 | F | 148 | 47 | 21.46 | 116/80 | 9.75 |
| 137 | 65 | F | 150 | 60 | 26.67 | 118/76 | 10.50 |
| 138 | 68 | F | 140 | 55 | 28.06 | 124/86 | 10.50 |
| 139 | 65 | F | 155 | 46 | 19.15 | 126/90 | 11.25 |
| 140 | 65 | F | 155 | 46 | 19.15 | 126/90 | 11.25 |
| 141 | 60 | F | 151 | 87 | 38.16 | 130/80 | 9.75 |
| 142 | 70 | F | 133 | 35 | 19.79 | 136/86 | 9.75 |
| 143 | 70 | F | 149 | 35 | 15.77 | 110/70 | 8.25 |
| 144 | 61 | F | 150 | 60 | 26.67 | 140/96 | 10.50 |
| 145 | 64 | F | 137 | 43 | 22.91 | 160/84 | 9.75 |

| | | | | | | | |
|-----|----|---|-----|----|-------|--------|-------|
| 146 | 64 | F | 140 | 37 | 17.60 | 130/86 | 10.50 |
| 147 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 148 | 60 | F | 142 | 37 | 18.35 | 120/76 | 9.75 |
| 149 | 70 | F | 142 | 84 | 41.66 | 140/88 | 9.00 |
| 150 | 70 | F | 142 | 84 | 41.66 | 140/88 | 9.00 |
| 151 | 68 | F | 143 | 37 | 18.09 | 110/80 | 9.75 |
| 152 | 65 | F | 148 | 47 | 21.46 | 116/80 | 9.75 |
| 153 | 68 | F | 143 | 37 | 18.09 | 140/90 | 10.50 |
| 154 | 61 | F | 150 | 60 | 26.67 | 140/96 | 10.50 |
| 155 | 64 | F | 137 | 43 | 22.91 | 160/84 | 9.75 |
| 156 | 70 | F | 153 | 47 | 20.08 | 136/90 | 9.75 |
| 157 | 60 | F | 147 | 59 | 27.30 | 130/80 | 10.50 |
| 158 | 68 | F | 148 | 40 | 18.26 | 100/70 | 10.50 |
| 159 | 65 | F | 155 | 46 | 19.15 | 126/90 | 11.25 |
| 160 | 65 | F | 153 | 66 | 28.19 | 170/80 | 10.50 |
| 161 | 64 | F | 140 | 55 | 28.06 | 124/86 | 10.50 |
| 162 | 72 | F | 150 | 41 | 18.22 | 116/60 | 9.00 |
| 163 | 65 | F | 160 | 50 | 19.53 | 146/90 | 9.75 |
| 164 | 64 | F | 164 | 61 | 22.68 | 126/86 | 9.75 |
| 165 | 70 | F | 149 | 35 | 15.77 | 110/70 | 8.25 |
| 166 | 75 | F | 149 | 35 | 15.77 | 140/88 | 9.75 |
| 167 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 168 | 64 | F | 145 | 37 | 17.60 | 130/86 | 10.50 |
| 169 | 68 | F | 143 | 37 | 18.09 | 140/90 | 10.50 |
| 170 | 62 | F | 147 | 51 | 23.60 | 140/90 | 10.0 |
| 171 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 172 | 61 | F | 150 | 60 | 26.67 | 140/96 | 10.50 |
| 173 | 64 | F | 137 | 43 | 22.91 | 160/84 | 9.75 |
| 174 | 64 | F | 145 | 37 | 17.60 | 130/86 | 10.50 |
| 175 | 75 | F | 146 | 47 | 22.05 | 130/80 | 10.50 |
| 176 | 64 | F | 140 | 55 | 28.06 | 124/86 | 9.75 |
| 177 | 65 | F | 160 | 50 | 19.53 | 146/90 | 9.75 |
| 178 | 72 | F | 146 | 39 | 18.30 | 140/90 | 9.75 |
| 179 | 68 | F | 140 | 55 | 28.06 | 124/86 | 9.75 |
| 180 | 65 | F | 153 | 66 | 28.19 | 170/80 | 9.75 |
| 181 | 65 | F | 152 | 37 | 16.01 | 146/88 | 10.50 |
| 182 | 70 | F | 153 | 47 | 20.08 | 136/90 | 9.75 |

REPORT ON URBAN MALE RESPONDENTS

| S.No. | Age | Sex | Height | Weight | Body Mass | Blood Press | Haemo. in GMS |
|-------|-----|-----|--------|--------|-----------|-------------|---------------|
| 1 | 80 | M | 152 | 45 | 19.48 | 155/92 | 10.50 |
| 2 | 65 | M | 154 | 64 | 26.99 | 160/100 | 11.25 |
| 3 | 62 | M | 172 | 71 | 24.00 | 160/90 | 11.25 |
| 4 | 61 | M | 152 | 62 | 26.84 | 150/80 | 9.75 |
| 5 | 70 | M | 174 | 59 | 19.49 | 116/86 | 11.25 |
| 6 | 61 | M | 170 | 71 | 24.57 | 140/90 | 12.00 |
| 7 | 67 | M | 176 | 62 | 20.02 | 130/80 | 11.25 |
| 8 | 85 | M | 151 | 47 | 19.00 | 150/90 | 10.65 |
| 9 | 62 | M | 170 | 60 | 20.76 | 120/76 | 11.25 |
| 10 | 58 | M | 152 | 48 | 20.78 | 150/94 | 11.25 |
| 11 | 68 | M | 168 | 63 | 22.32 | 140/80 | 12.00 |
| 12 | 67 | M | 174 | 87 | 28.74 | 156/100 | 11.25 |
| 13 | 60 | M | 172 | 51 | 17.24 | 170/100 | 9.75 |
| 14 | 65 | M | 160 | 66 | 25.78 | 136/88 | 11.25 |
| 15 | 63 | M | 161 | 65 | 25.08 | 150/90 | 13.50 |
| 16 | 60 | M | 151 | 76 | 27.47 | 164/100 | 11.25 |
| 17 | 60 | M | 152 | 56 | 24.24 | 170/120 | 10.50 |
| 18 | 83 | M | 167 | 43 | 15.42 | 116/80 | 10.50 |
| 19 | 80 | M | 167 | 65 | 23.31 | 170/120 | 11.25 |
| 20 | 71 | M | 164 | 40 | 14.87 | 120/76 | 10.50 |
| 21 | 66 | M | 156 | 44 | 18.08 | 122/70 | 11.25 |
| 22 | 74 | M | 150 | 55 | 24.44 | 134/88 | 10.50 |
| 23 | 74 | M | 171 | 72 | 24.62 | 164/90 | 12.00 |
| 24 | 80 | M | 160 | 48 | 18.75 | 170/90 | 10.50 |
| 25 | 63 | M | 166 | 78 | 28.31 | 156/90 | 11.25 |
| 26 | 68 | M | 165 | 50 | 18.37 | 140/90 | 10.50 |
| 27 | 65 | M | 148 | 56 | 25.57 | 150/90 | 10.50 |
| 28 | 65 | M | 160 | 45 | 17.58 | 124/80 | 10.50 |
| 29 | 67 | M | 160 | 59 | 23.05 | 194/106 | 11.25 |
| 30 | 60 | M | 158 | 40 | 16.02 | 130/88 | 8.25 |
| 31 | 60 | M | 158 | 47 | 18.83 | 126/84 | 10.80 |
| 32 | 63 | M | 158 | 45 | 18.03 | 126/80 | 11.25 |
| 33 | 70 | M | 157 | 40 | 16.23 | 108/78 | 8.25 |
| 34 | 77 | M | 179 | 48 | 14.98 | 160/100 | 10.50 |
| 35 | 61 | M | 175 | 84 | 27.43 | 125/96 | 11.25 |
| 36 | 95 | M | 150 | 53 | 23.56 | 116/70 | 10.50 |
| 37 | 66 | M | 163 | 53 | 19.95 | 120/80 | 10.50 |
| 38 | 70 | M | 163 | 40 | 15.06 | 110/70 | 10.50 |
| 39 | 70 | M | 172 | 60 | 20.28 | 120/80 | 11.25 |
| 40 | 85 | M | 160 | 45 | 17.58 | 130/69 | 9.00 |
| 41 | 66 | M | 163 | 53 | 19.95 | 120/80 | 10.50 |
| 42 | 70 | M | 174 | 59 | 19.49 | 116/86 | 11.25 |
| 43 | 62 | M | 170 | 60 | 20.76 | 120/76 | 11.25 |
| 44 | 70 | M | 172 | 60 | 20.28 | 120/80 | 11.25 |
| 45 | 77 | M | 179 | 48 | 14.98 | 160/100 | 10.50 |

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|----|----|---|-----|----|-------|---------|-------|
| 46 | 68 | M | 165 | 50 | 18.37 | 140/90 | 10.50 |
| 47 | 65 | M | 154 | 64 | 20.99 | 160/100 | 11.25 |
| 48 | 62 | M | 172 | 71 | 24.00 | 160/90 | 11.25 |
| 49 | 67 | M | 176 | 62 | 20.00 | 130/80 | 11.25 |
| 50 | 58 | M | 152 | 48 | 20.78 | 150/94 | 11.25 |
| 51 | 66 | M | 163 | 53 | 19.95 | 120/80 | 10.50 |
| 52 | 71 | M | 164 | 40 | 14.87 | 120/76 | 10.50 |
| 53 | 74 | M | 150 | 55 | 24.44 | 134/88 | 10.50 |
| 54 | 63 | M | 166 | 78 | 28.31 | 150/90 | 11.25 |
| 55 | 65 | M | 154 | 64 | 20.99 | 160/100 | 11.25 |
| 56 | 68 | M | 165 | 50 | 18.37 | 140/90 | 10.50 |
| 57 | 65 | M | 148 | 56 | 25.57 | 150/90 | 10.50 |
| 58 | 65 | M | 160 | 45 | 17.58 | 124/80 | 10.50 |
| 59 | 60 | M | 158 | 40 | 16.02 | 130/88 | 8.25 |
| 60 | 60 | M | 158 | 47 | 18.83 | 126/84 | 10.80 |
| 61 | 63 | M | 158 | 45 | 18.00 | 126/80 | 11.25 |
| 62 | 70 | M | 172 | 60 | 20.28 | 120/80 | 11.25 |
| 63 | 66 | M | 163 | 53 | 19.95 | 120/80 | 10.50 |
| 64 | 61 | M | 152 | 62 | 26.84 | 150/80 | 9.75 |
| 65 | 58 | M | 152 | 48 | 20.78 | 150/94 | 11.25 |
| 66 | 70 | M | 163 | 40 | 15.06 | 110/70 | 10.50 |
| 67 | 70 | M | 172 | 60 | 20.28 | 120/80 | 11.25 |
| 68 | 66 | M | 163 | 53 | 19.95 | 120/80 | 10.50 |
| 69 | 60 | M | 156 | 40 | 16.02 | 130/88 | 8.25 |
| 70 | 60 | M | 158 | 47 | 18.83 | 126/84 | 10.80 |
| 71 | 63 | M | 158 | 45 | 18.03 | 126/80 | 11.25 |
| 72 | 70 | M | 157 | 40 | 16.23 | 108/78 | 8.25 |
| 73 | 77 | M | 179 | 48 | 14.98 | 160/100 | 10.50 |
| 74 | 68 | M | 166 | 50 | 18.37 | 140/90 | 10.50 |
| 75 | 74 | M | 171 | 72 | 24.62 | 164/90 | 12.00 |
| 76 | 67 | M | 174 | 87 | 28.74 | 156/100 | 11.25 |
| 77 | 61 | M | 170 | 71 | 24.57 | 140/90 | 12.00 |
| 78 | 58 | M | 152 | 48 | 20.78 | 150/94 | 11.25 |
| 79 | 66 | M | 163 | 53 | 99.95 | 120/80 | 10.50 |
| 80 | 77 | M | 179 | 48 | 14.98 | 160/100 | 10.50 |
| 81 | 66 | M | 163 | 53 | 99.95 | 120/80 | 10.50 |
| 82 | 65 | M | 148 | 56 | 20.57 | 150/90 | 10.50 |
| 83 | 65 | M | 160 | 65 | 25.08 | 150/90 | 11.25 |
| 84 | 65 | M | 154 | 64 | 26.99 | 160/100 | 11.25 |
| 85 | 61 | M | 152 | 62 | 26.84 | 150/80 | 9.75 |
| 86 | 62 | M | 170 | 60 | 20.76 | 120/76 | 11.25 |
| 87 | 71 | M | 164 | 40 | 14.87 | 120/76 | 10.50 |
| 88 | 68 | M | 165 | 50 | 18.37 | 140/90 | 10.50 |
| 89 | 77 | M | 179 | 48 | 14.98 | 160/100 | 10.50 |
| 90 | 70 | M | 163 | 40 | 15.06 | 110/70 | 10.50 |
| 91 | 74 | M | 171 | 72 | 24.62 | 164/90 | 12.00 |
| 92 | 65 | M | 154 | 64 | 26.99 | 160/100 | 11.25 |
| 93 | 58 | M | 152 | 48 | 20.78 | 150/94 | 11.25 |
| 94 | 80 | M | 152 | 45 | 19.48 | 150/92 | 10.50 |
| 95 | 60 | M | 151 | 76 | 27.47 | 164/100 | 11.25 |

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|-----|----|---|-----|----|-------|---------|-------|
| 96 | 66 | M | 156 | 44 | 18.08 | 122/70 | 11.25 |
| 97 | 60 | M | 152 | 56 | 24.24 | 170/120 | 10.50 |
| 98 | 63 | M | 166 | 78 | 28.31 | 156/90 | 11.25 |
| 99 | 70 | M | 157 | 40 | 16.23 | 108/78 | 8.25 |
| 100 | 77 | M | 179 | 48 | 14.98 | 160/100 | 10.50 |
| 101 | 74 | M | 150 | 55 | 24.44 | 134/88 | 10.50 |
| 102 | 71 | M | 164 | 40 | 14.87 | 120/76 | 10.50 |
| 103 | 68 | M | 165 | 50 | 18.37 | 140/90 | 10.50 |
| 104 | 75 | M | 171 | 72 | 24.62 | 164/90 | 12.00 |
| 105 | 60 | M | 152 | 56 | 24.24 | 170/120 | 10.50 |
| 106 | 62 | M | 172 | 71 | 24.00 | 160/90 | 11.25 |
| 107 | 67 | M | 176 | 62 | 20.02 | 130/80 | 11.25 |
| 108 | 61 | M | 175 | 84 | 27.43 | 125/96 | 11.25 |
| 109 | 63 | M | 158 | 45 | 18.03 | 126/80 | 11.25 |
| 110 | 65 | M | 160 | 45 | 17.58 | 124/80 | 10.50 |
| 111 | 74 | M | 150 | 55 | 24.44 | 134/88 | 10.50 |
| 112 | 58 | M | 152 | 48 | 20.78 | 150/94 | 11.25 |
| 113 | 71 | M | 164 | 40 | 14.87 | 120/76 | 10.50 |
| 114 | 65 | M | 148 | 56 | 25.57 | 150/90 | 10.50 |
| 115 | 70 | M | 157 | 40 | 16.23 | 108/78 | 8.25 |
| 116 | 66 | M | 163 | 53 | 19.93 | 120/80 | 10.50 |
| 117 | 67 | M | 176 | 62 | 20.02 | 130/80 | 11.25 |
| 118 | 60 | M | 152 | 56 | 24.24 | 170/120 | 10.50 |

APPENDIX V

| Problems | Percentage of respondents | | | | | | | | | | | | | | |
|-------------------------------|---------------------------|------|--------|-------|--------------|-------|-----------|------|------------|-------|---------------|-----------|-------|------|------|
| | Area | | Sex | | Age in years | | Education | | Occupation | | Income in Rs. | | | | |
| | Urban | Male | Female | 60-69 | 70-79 | 80+ | Illit. | NGE | SE | EP | <1000 | 1001-2000 | >2000 | | |
| Nutritional Problems | | | | | | | | | | | | | | | |
| Anaemia | 89.3 | 62.7 | 66.7 | 80.0 | 73.3 | 83.95 | 71.43 | 83.9 | 65.9 | 61.1 | 64.83 | 100.0 | 98.8 | 53.3 | 44.0 |
| Angular stomatitis | 23.33 | 18.0 | 15.6 | 22.9 | 18.9 | 27.2 | 14.3 | 26.8 | 12.9 | 20.7 | 7.2 | 65.2 | 65.6 | 42.1 | 27.7 |
| Spongy and bleeding gum | 14.7 | 32.7 | 17.8 | 26.2 | 23.5 | 24.7 | 21.4 | 27.4 | 18.9 | 26.91 | 21.3 | 29.1 | 16.1 | 17.3 | |
| Phryoderma | 32.0 | 23.3 | 25.6 | 28.6 | 27.8 | 24.7 | 35.7 | 28.6 | 25.6 | 29.1 | 15.5 | 42.1 | 27.3 | 41.7 | 17.3 |
| Glossitis | 48.0 | 39.3 | 43.3 | 43.8 | 40.3 | 49.1 | 50.0 | 48.8 | 37.1 | 33.7 | 68.9 | 84.2 | 60.6 | 22.3 | 22.7 |
| Dry and rough skin | 16.7 | 6.0 | 33.3 | 6.7 | 9.4 | 11.1 | 25.0 | 12.0 | 17.0 | 7.0 | 21.0 | 7.0 | 6.0 | | |
| Loss of appetite | 21.3 | 30.7 | 20.0 | 28.6 | 23.0 | 27.2 | 42.9 | 29.8 | 21.2 | 18.8 | 37.9 | 73.7 | 35.2 | 16.7 | 13.3 |
| Physiological Problems | | | | | | | | | | | | | | | |
| Cataract | 79.3 | 51.3 | 54.4 | 70.0 | 60.7 | 72.8 | 75.0 | 74.4 | 53.8 | 56.5 | 68.4 | 72.7 | 96.7 | 24.0 | |
| Toothlessness | 62.0 | 58.0 | 46.7 | 65.7 | 52.4 | 74.1 | 71.4 | 68.5 | 49.2 | 44.8 | 89.7 | 48.0 | 77.0 | 40.0 | 38.7 |
| Pyrrhoea | 15.3 | 42.7 | 18.9 | 33.3 | 22.0 | 37.0 | 53.6 | 17.5 | 16.3 | 68.4 | 17.9 | 16.3 | 39.5 | 41.7 | 13.3 |
| Hard of hearing | 56.0 | 28.0 | 28.9 | 47.6 | 38.2 | 49.4 | 46.4 | 56.6 | 23.5 | 31.3 | 82.8 | 42.1 | 64.2 | 13.3 | 16.0 |
| Bad breath | 75.3 | 14.7 | 27.8 | 52.4 | 30.4 | 66.7 | 82.1 | 64.5 | 18.9 | 27.4 | 55.0 | 100.0 | 58.8 | 38.3 | 20.0 |
| Micturition problem | 16.0 | 16.0 | 14.0 | 16.7 | 13.1 | 22.2 | 17.9 | 20.2 | 10.6 | 6.3 | 51.7 | 21.1 | 19.4 | 10.0 | 13.3 |
| Itching | 37.3 | 24.7 | 31.1 | 31.0 | 25.7 | 37.0 | 50.0 | 42.9 | 16.0 | 17.0 | 69.0 | 79.0 | 41.2 | 21.7 | 16.0 |

General Problems

| | | | | | | | | | | | | | | | |
|------------------------|------|-------|------|------|------|------|------|------|------|-------|------|------|------|------|------|
| Fatigue | 32.0 | 64.0 | 37.8 | 52.4 | 45.0 | 56.8 | 78.6 | 54.8 | 47.0 | 52.5 | 39.7 | 73.7 | 57.6 | 40.0 | 46.7 |
| Sleeplessness | 36.7 | 42.7 | 31.1 | 43.3 | 36.7 | 43.2 | 50.0 | 47.0 | 30.3 | 28.7 | 63.8 | 24.7 | 54.6 | 33.3 | 26.7 |
| Shortness of breath | 48.0 | 38.67 | 31.1 | 48.6 | 35.6 | 51.9 | 71.9 | 42.9 | 43.9 | 27.4 | 87.9 | 94.9 | 54.6 | 33.3 | 26.7 |
| Headache | 30.7 | 55.3 | 27.8 | 47.6 | 33.0 | 21.6 | 42.9 | 41.1 | 22.7 | 23.8 | 60.3 | 57.9 | 44.9 | 16.9 | 20.0 |
| Chest pain | 44.7 | 38.7 | 27.8 | 47.6 | 66.7 | 11.7 | 10.7 | 45.2 | 37.1 | 22.9 | 98.3 | 66.7 | 11.7 | 10.7 | |
| Palpitation | 15.3 | 28.0 | 7.8 | 27.6 | 20.1 | 22.2 | 25.0 | 25.6 | 16.7 | 19.7 | 25.9 | 31.6 | 23.0 | 15.0 | 24.0 |
| Giddiness | 60.0 | 21.3 | 40.7 | 22.2 | 48.6 | 37.2 | 48.2 | 42.9 | 25.6 | 16.7 | 21.7 | 28.3 | 89.9 | 59.4 | 18.7 |
| Body pain | 29.3 | 35.3 | 26.7 | 24.8 | 25.1 | 43.2 | 36.3 | 27.3 | 14.3 | 100.0 | 47.4 | 42.4 | 31.7 | 10.7 | |
| Oedema | 16.7 | 7.3 | 10.0 | 12.9 | 8.4 | 18.5 | 17.9 | 14.3 | 9.1 | 16.0 | 8.0 | 12.0 | 20.0 | 10.0 | 6.0 |
| Burning sensation | 54.4 | 23.3 | 26.7 | 43.8 | 32.5 | 54.5 | 34.7 | 20.5 | 34.1 | 41.4 | 84.2 | 53.9 | 20.0 | 21.0 | |
| Numbness in limbs | 38.7 | 38.0 | 22.2 | 45.2 | 32.5 | 52.3 | 35.7 | 51.8 | 21.2 | 38.3 | 29.6 | 60.3 | 50.9 | 23.3 | 22.7 |
| Dry cough/wheezing | 53.3 | 51.3 | 36.7 | 46.2 | 15.7 | 17.3 | 71.4 | 47.6 | 37.9 | 33.2 | 87.9 | 36.8 | 55.8 | 30.0 | 26.0 |
| Abdominal pain | 13.3 | 20.2 | 12.2 | 18.6 | 15.7 | 18.5 | 17.9 | 16.1 | 17.4 | 2.7 | 53.5 | 68.4 | 27.0 | 30.0 | 10.0 |
| Constipation | 9.3 | 10.7 | 7.8 | 11.0 | 9.4 | 8.6 | 17.9 | 11.9 | 7.5 | 12.0 | 12.0 | 6.0 | 20.0 | 5.0 | 5.0 |
